

Family Planning Methods and Practice: AFRICA



2000 edition—special section on AIDS

Family Planning Methods and Practice: Africa

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**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
Division of Reproductive Health
Atlanta, Georgia 30333
United States of America**

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The reader is urged to review the package information from the manufacturers of the medications mentioned or the Formulary for his or her clinic or hospital.

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Foreword

Behind every number is a human face – William H. Foege, MD

The first edition of *Family Planning Methods and Practice: Africa*, published in 1983, became widely known as “The Yellow Book.” The influence of this book could be felt internationally. Besides helping educate health practitioners in Africa, it helped health professionals in the Western World learn more about the people of Africa. For me, the book contained important lessons that proved useful on my trips to northern and western Africa.

Both health and the quality of life in Africa have changed profoundly since the publication of the first edition, in many ways because of family planning. Recent data show a striking decrease in infant mortality, accompanied by an increased life expectancy and a decline in fertility, for all the major regions of the continent.¹

The practice of family planning also has caused other important changes. In addition to changing individual behavior and fertility, family planning has changed the dynamics of family life and the characteristics of national populations in Africa and around the world. Moreover, it has led to international meetings that addressed abortion, the role of women, and the impact of an increasing population on family life.

In the years since the first publication was distributed, individual lives have changed. My own family of four children began before we recognized family size and population change as issues of global, not just local, importance. Our first daughter was born before oral contraception was available. Abortion was not legal in the United States. Women underwent voluntary surgical contraception only if that was approved by at least two physicians. More than 30 years have passed since the birth of our youngest child. To my deep sorrow, my wife died without seeing any of her grandchildren. Two of our daughters are married. Although my wife and I started our family before we were 25 years old, our children have waited to start their families until they

were older than 30. Now I have two grandsons and a granddaughter. One of my daughters has two children and expects that she has completed her family. All of our offspring have a clearer understanding of the importance of family size to themselves, their community, their nation, and indeed, the entire planet. This was not so when my wife and I started our family. Changes like this, although they are in a single family, have implications for the future of humanity.

Profound changes have occurred in the years since the first edition of this book. In 1992 African ministers of government met in Dakar and issued a declaration on population for Africa. In preparing this declaration, they reviewed key global documents and the state of their own continent. The declaration dealt with a broad spectrum of human concerns. Its principles covered population and economic development; fertility, families, and family planning; mortality, morbidity, and the acquired immunodeficiency syndrome (AIDS); urbanization and migration; and the status of women.²

In 1994, Egypt hosted the Third International Conference on Population and Development, which was sponsored by the United Nations. A new emphasis was placed on reproductive health rather than population policy. Controversies arose about abortion and the empowerment of women. Differences on these issues were resolved and conferees issued a Program of Action at the conclusion of the meeting. Africa, and Egypt in particular, emerged as a place where the world could convene to consider important global matters in a secure environment.

Besides political changes, the world is intensely concerned about the global human immunodeficiency virus (HIV) and AIDS epidemics. Infections caused by HIV have seriously influenced Africans, their families, and their communities. Human behavior, including intimate sexual practices, plays an important role in transmitting this disease. The fundamental changes in personal lifestyles required to interrupt this contagion are likely to require more from people of Africa than from people of many other places.

The first edition of *Family Planning Methods and Practice: Africa* has played an important role in improving health for Africa. The book told health professionals, scholars, students, and many others about

family planning. It helped everyone recognize how families and family planning affect the health and life of people, especially the people of this continent.

The unique character of both the first and second editions of *Family Planning Methods and Practice: Africa* is seen immediately in their tables of contents. The authors focus specifically on Africa, even though the lessons they teach are important for all of us. Both volumes address issues that are simultaneously profound and global, intense, and personal. They deal with health benefits for countries and individuals and with basic human behaviors that influence future generations, today's families, and the day-to-day life of adolescents.

This new edition still emphasizes family planning methods and practice as they relate to Africa. It gives current information about the menstrual cycle and contraception. It introduces significant new topics. The chapter on HIV infections is especially important. The section on reproductive behavior and population change will be critical to public health officials. The expanded section on "Providing Family Planning Services" has greater depth and breadth because it includes a chapter on education and counseling, as well as one on quality assurance. This new edition brings important ideas to the provision of services for family planning. Prevention, education, and the quality of clinical service get greater emphasis. It also discusses, in detail, new approaches to contraception, such as long-acting hormone implants. Program management, as well as clinic management, is an important part of this new edition.

I hope readers will find this version of what has been called "the Yellow Book" timely, informative, and even more interesting and useful than the first edition.

Carl W. Tyler, MD

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Preface

A new mother asked me for protection against sexually transmitted infection. She was concerned about her husband's promiscuous behavior. I suggested that she talk openly with her husband about her concerns. She was worried about sexually transmitted infections, especially the "slim disease," which is the common term for acquired immunodeficiency syndrome (AIDS). Because she wanted to get pregnant again, she was also concerned about possibly infecting an unborn child. I gave her educational materials and a bag of condoms. She shook her head, saying her husband would refuse to wear condoms and would feel insulted. Her husband, I said, had two choices if he cared for his wife and children: to be faithful to her or at least to wear condoms. I encouraged her to have her husband, a college-educated high school teacher, to come talk with me.

Two weeks later, the woman returned with black and purple bruises over her face. "Doctor," she said, "I came just to show you what your condoms and advice have brought me." She had been badly beaten by her husband.

Six months later, this woman tested positive for the human immunodeficiency virus (HIV).

Providing contraceptives in Africa is a challenging task—especially in the era of the AIDS epidemic. In many African countries, ignorance of sexual matters is considered a sign of purity. Most people in Africa find it difficult, even shameful, to talk about sex and its various consequences. These general attitudes have kept millions of young people, especially young women, from seeking accurate reproductive and sexual information from reliable sources.

Although the African family is still a strong and extended network of obligation and protection, traditional practices have eroded rapidly in recent decades. While it is normal and healthy for people to enjoy active sex lives, it is important for them to know that they are at

risk for sexually transmitted infections (STIs). There are more than 30 STIs; ignoring them can adversely affect a person's life. When cultural beliefs equate ignorance with virtue and when discomfort and shame overshadow common sense, people cannot take good care of themselves and their loved ones.

Studies have shown that Africa has one of the highest fertility rates in the world as well as the majority of cases of human immunodeficiency virus (HIV) infection and AIDS, especially among heterosexual couples. Whereas men make up the overwhelming majority of AIDS cases in Western countries, African women and men are infected in almost equal proportions. And yet, it would appear that many of these women do not engage in risky behavior. They confine themselves to monogamous sex. However, they are the victims of another cultural characteristic: gender inequality. Too often, it is the sexual behavior of men that exposes their wives to serious infection.

During my many years of medical practice and public health research in Zaire, time and time again, gender inequality created barriers to community health. My team and I conducted a field study on the perinatal transmission of HIV among women receiving prenatal care in an upper middle class clinic in Kinshasa. After a precounseling session, women were screened for HIV antibodies and other STIs. The screening was free of charge, and women were encouraged to bring in their spouses or partners for a free STI screening. Only 1.6% of the male partners participated.

As a male physician, I must always remember that the female gender so lacking in equality includes my own daughters, sisters, mother, and grandmother, whom I so cherish. Would I allow another person to place their lives in jeopardy? As a husband, I may desire more children, but my wife is the one who faces the physical challenge of the pregnancy, delivers the child, and takes the major role in rearing. How could I have a pure conscience if I insisted on having a child when my wife was hesitant?

The way we define a problem determines how we approach its solution. Being of African heritage, I personally cannot accept that gender inequality—denying women sufficient power to safeguard

their health; control their sexuality; and make informed choices about education, marriage, and childbearing—is an inevitable element of the African culture.

Cultural practices are hard to change, but culture is never static. None of us can change what we have done in the past, but once we learn more, we are responsible to act more wisely in the future.

Let us rise up, O African people! Let us make positive changes in the lives of women—for the future of our families and nations.

Manzila Tarande, MD, MPH

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This second edition of *Family Planning Methods and Practice: Africa* is the product of collaboration between African and American colleagues, the Centers for Disease Control and Prevention (CDC), and is supported by the United States Agency for International Development (USAID).

In addition to the principal authors, nearly 100 individuals contributed to this second edition of *Family Planning Methods and Practice: Africa* by writing, reviewing, or editing various chapters of the book. Several persons were instrumental in making the book appear in print: **Barbara Lord** did the lion's share of the production work such as design and layout, **Martha Boyd** designed the cover, **Tim Johnson**, DrPH, MSc, **Timothy Miner**, MPH, and **Neal Ewen** patiently and ably oversaw administrative matters, and **Patricia Yeargin**, MA, CHES, had the difficult task of keeping current the information on human immunodeficiency virus throughout the lengthy development of the book.

The knowledge and wisdom underlying this book grew from the dedicated work of hard-working, devoted practitioners who were so instrumental in developing and distributing the first edition in 1983 — notably, **Samiha Ben Fadhel**, MD, ChB; **Nimrod A. Mandara**, MD; **Japheth Kimanzi Mati**, MB, ChB, MD, FRCOG, and **Fred T. Sai**, MB, FRCPE, MPH. Those principally responsible for producing that edition, were **Robert A. Hatcher**, MD, MPH, **Michael E. Dalmat**, Dr. P.H., **Deborah Kowal**, MA, **Felicia H. Stewart**, MD, and **Gary K. Stewart**, MD.

We will miss the insight and warm smile of our colleague, **Gary Stewart**, who played a large role in writing both editions. Dr. Stewart died May 1998, as the book was nearing its final production phase. As an obstetrician/gynecologist, Dr. Stewart provided excellent and empathetic care to many women and their families. His interest in the health of African families stemmed from his work as a Peace Corps staff physician in Malawi and Kenya during the 1960s. More recently, he traveled to African nations to train other clinicians. We thank our friend and colleague for his unique and valuable contributions.

Robert A. Hatcher
Deborah Kowal

Contributors

Many individuals, both African and American, contributed to this second edition of *Family Planning Methods and Practice: Africa*. They helped ensure the completeness, accuracy, timeliness, and usefulness of the information contained herein.

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Benefits of Family Planning

The little boy was small and feeble. He still did not crawl very well. He did not smile much. The traditional birth attendant slowly shook her head and then turned to check the mother's growing belly. The mother herself was weak and she had swollen up too much with this pregnancy. She would need to be delivered in the hospital again because of the toxemia. Another baby coming to the family—coming only a little more than a year after the birth of the young boy sitting unsteadily by his mother's side. The husband was deeply concerned about the health of his wife and child and the baby to come. Maybe this time the mother and father would reconsider and use a contraceptive.

The decision of when or even whether to have children is a basic human right. The International Conference on Population and Development, held in Cairo, Egypt, in September 1994, clearly endorsed this right:²⁵

Everyone has the right to the enjoyment of the highest attainable standard of physical and mental health. States should take all appropriate measures to ensure, on a basis of equality of men and women, universal access to health care services, including those related to reproductive health, which includes family planning and sexual health. Reproductive health care programmes should provide the widest range of services without any form of coercion. All couples and individuals have the basic right to decide

freely and responsibly the number and spacing of their children and to have the information, education and means to do so.

With this right come both benefits and risks. Family planning programs provide services that help people achieve the number of children they desire, reduce the number of unwanted pregnancies, reduce the risk of sexually transmitted infection (STI), and improve the health of women and children. Family planning can help couples reduce the factors that place the health of women and children at most risk:

- Age at pregnancy (too young or too old)
- Too many pregnancies
- Pregnancies spaced too closely together

Family planning also helps improve the future by allowing parents to better plan their lives. Poverty and lack of education limit the opportunities for individuals and families. Through family planning, however, individuals can obtain greater prosperity and security for the family because they can have a better chance at receiving an education and devoting more time to earning an income. Women can better fulfill the many roles for which they are ultimately capable: mother, wife, wage earner, community member. In turn, a man can better expand his roles as father, husband, family caregiver, and advocate of his family members' potentials.

FERTILITY AND MORTALITY RATES

In general, the countries with the highest rates of fertility also have the highest rates of maternal, infant, and child mortality. African people have long valued fertility, and as a result, many couples have large families. The average number of live births per African woman is 5.6. (See Table 1:1.) The *actual* number of pregnancies required to produce the 5.6 average number of live births would be higher because not all pregnancies come to term and a number of infants do not survive. Compared to women elsewhere in the world, women in most sub-Saharan countries bear children at younger ages, have larger families, and make much less use of family planning.²³

Table 1:1 Total fertility rate (TFR)

Country	TFR
Botswana	4.6
Burundi	6.8
Cameroon	5.9
Ghana	5.5
Kenya	5.4
Liberia	6.4
Mali	6.7
Mauritius	2.1
Niger	7.4
Nigeria	6.2
Senegal	6.0
Sudan	5.0
Swaziland	4.9
Tanzania	6.3
Togo	6.9
Uganda	6.9
Zambia	6.1
Zimbabwe	4.4

Source: Population Reference Bureau (1997)

MATERNAL MORTALITY

Each time a woman in one of the world's poorest countries becomes pregnant, her risk of dying from that pregnancy is as much as 200 times greater than the risk for a woman in the United States or Europe.³⁰ Because of the high fertility rate, poor health conditions in general, and inadequate availability of medical care, the risks of pregnancy are higher in Africa than anywhere else on earth. An African woman's chance of dying from pregnancy-related causes—obstructed labor, postpartum hemorrhage, pregnancy-induced hypertension, postpartum infections, and unsafe abortion—averages 870 per 100,000 live births.³⁰ In contrast, the risk of maternal death in industrialized nations averages 27 per 100,000 live births. (See Table 1:2.)

Table 1:2 Estimates of maternal mortality

Region	Maternal deaths/100,000 live births	Lifetime risk of maternal death – 1 in every:
World	430	60
Developed countries	27	1,800
Developing countries	480	48
Africa	870	16
Northern	340	55
Western	1,020	12
Eastern	1,060	12
Middle	950	14
Southern	260	75

Source: WHO and UNICEF (1996)

A rate of 700 maternal deaths per 100,000 live births means that a woman's risk of dying from a single pregnancy is about 1 in every 140 live births. Over a lifetime, the average African woman, who has six or seven children, has an estimated maternal mortality risk of 1 in 16.³⁰ However, many African women have as many as eight children with even more pregnancies. For these women, the risk of maternal mortality may be even greater.

MATERNAL MORBIDITY

A mother's death represents one end of the spectrum of pregnancy complications. Experts believe that pregnancy-related morbidity far exceeds pregnancy-related mortality. However, illnesses that do not result in death but leave women weakened or in poor health are not measured in most developing nations. Family planning would reduce the risk of pregnancy-related morbidity.

Family planning services also reduce the risk of STIs, which are a major public health problem in Africa. As of 1996, more than 13 million adults and 650,000 children in Africa were infected with the

human immunodeficiency virus (HIV).²⁹ Rates of other STIs remain unmeasured, but the resulting diseases are costly to society.²⁶ The vast majority of infertile African men and women have diagnoses associated with previous STIs.

CONTRACEPTIVE-RELATED MORTALITY

In contrast to the significant risk of death from pregnancy-related complications, the risk of death from using contraceptives is exceedingly low. Table 1:3 shows the risk of death associated with contraceptive use in the United States. Some contraceptives may *increase* health risks by introducing hormones that affect the cardiovascular system or the development of some cancers; others may involve the risks of surgical or invasive procedures. On the other hand, some contraceptives *decrease* health risks by providing protection against certain reproductive cancers or STIs such as HIV, which causes acquired immunodeficiency syndrome (AIDS). All contraceptives decrease the risk of maternal mortality from pregnancy-related causes.

INFANT AND CHILD MORTALITY

The highest risk of death worldwide for children under 5 years of age is borne by children in sub-Saharan Africa (200 deaths per 1,000 births); children in northern Africa (140 deaths per 1,000 births) have the next highest rate. (See Table 1:4.) Infectious disease and malnutrition rates remain high among children in sub-Saharan Africa.²⁰ However, child survival has improved in some African nations over the years, perhaps removing one of the pressures for women to bear many children.

Table 1:3 Safety of contraceptive methods

Method	Chance of death in 1 year of use
None, with pregnancy resulting in an African woman	1 in 120
Oral contraceptive	
Nonsmoker	1 in 66,700
Heavy smoker	1 in 1,700
Intrauterine device	1 in 10,000,000
Diaphragm, condom, spermicide	None
Fertility awareness (Natural family planning)	None
Sterilization	
Laparoscopic tubal ligation	1 in 38,000
Hysterectomy	1 in 1,600
Vasectomy	1 in 1,000,000

*Estimated pregnancy risks are based on the average mortality rate in Africa.
Estimated risks of contraceptive methods are derived from U.S.-based studies.*

Source: Hatcher et al. (1998)

FAMILY PLANNING BENEFITS TO WOMEN'S HEALTH

Simply providing contraception to women who desire it could reduce maternal deaths by as much as one-third.²¹ Family planning also protects women by preventing the risk factors that contribute to maternal mortality and morbidity. The highest risks of mortality are those for pregnancies among women who are too old (over 35), too young (under 16), or who have borne more than five children.

AVOIDING THE EXTREMES OF MATERNAL AGE

Family planning allows women to avoid becoming pregnant at the ages that pose the greatest risk to their health and the health of their children. Women older than 35 years tend to be at higher risk of death.^{4,16} These older women, generally multiparous, may have a flaccid uterine wall from repeated stretching during previous pregnancies.

Table 1:4 Infant and child mortality

Country, Year	Deaths per 1,000 births
Burkina Faso	97
Cameroon	69
Egypt	54
Ghana	77
Kenya	68
Madagascar	87
Malawi	140
Namibia	60
Morocco	51
Niger	119
Nigeria	73
Rwanda	121
Senegal	74
Togo	87
Tunisia	37
Uganda	112
Zambia	85
Zimbabwe	64

Source: McDeavitt TM (1996)

The weakened walls can lead to malpresentation, uterine rupture, hemorrhage associated with rupture, and hemorrhage associated with a flaccid uterine muscle. An abnormal placenta is more common in women above age 35 and in women who have had more than five births.⁷

Younger women and primigravidas tend to be at a higher risk of developing pregnancy-induced hypertension.^{1,28} The increased risk among younger primigravidas may reflect not so much increased physiological risk, but socioeconomic differences between younger mothers and women who have their first child at ages 20 to 24. For example, women who have their first child at very young ages may be from poorer families and have less access to, or make less use of, prenatal care, which could help prevent the risk factors for hypertension.^{6,14}

DECREASING RISKS BY DECREASING PARITY

Contraceptives allow a woman to avoid pregnancy and child-bearing once she reaches her desired family size. A mother's risk of dying climbs steadily as the number of births increases. Women who have had five or more births are 1.5 to 3 times more likely to die from pregnancy-related causes than are women who have had only two or three births.²⁰ If all women had five births or fewer, the number of maternal deaths could drop by 26% worldwide.⁸

PREVENTING HIGH-RISK PREGNANCIES

Family planning can improve women's health by preventing or delaying pregnancies among the women who are most likely to have a high-risk pregnancy:

- Women who have had previous pregnancy complications
- Women who have a chronic disease
- Women who have anemia (hemoglobin less than 10 gm)

The high rates of maternal mortality and morbidity in many developing countries can be partially attributed to the norms of living there: frequent pregnancies, prolonged lactation, heavy work, and food customs that are unhealthy for women (for example, women eat with the children after the men have satisfied themselves). This combination of factors produces a "continuous cumulative nutritional drain" on women; their bodies do not have time to replenish stores of vital nutrients.^{15,22} As a result, they are less able to combat infections associated with pregnancy, incomplete abortions, childbirth, puerperium, or everyday exposures to illness.

DECREASING ABORTION RISKS

One of the fundamental goals for family planning is to make "every child a wanted child." Some unwanted pregnancies are aborted. Although not conclusively documented, many maternal deaths related

to pregnancy are associated with incomplete abortions, whether self-induced or induced by a trained or untrained practitioner.

The major causes of maternal mortality related to abortion are hemorrhage and sepsis; the latter is an infection that spreads from the uterus to the abdominal cavity and then to the overall body. These conditions, which are caused by retained fetal or placental tissue, can lead to septic shock and death. In Addis Ababa, Ethiopia, post-abortion complications rank as the most common cause of maternal death, and are particularly common among young, unmarried women who have no other children.¹⁷

IMPROVING HEALTH THROUGH NONCONTRACEPTIVE BENEFITS

In addition to providing protection against pregnancy-related risks, a contraceptive may offer protection against STIs and reproductive tract cancers. Hormonal contraceptives such as pills, injectables, and implants protect a user against cancer of the uterus and ovaries, cysts in the breast or ovaries, ectopic pregnancy, and pelvic inflammatory disease (PID). Barrier methods such as condoms and diaphragms can protect women against STIs such as HIV and gonorrhea as well as related problems such as ectopic pregnancy, PID, and cancer of the cervix.

FAMILY PLANNING BENEFITS CHILDREN'S HEALTH

Many African families still measure their riches by the number of healthy children they bear. Family planning programs, along with diarrheal treatment programs, mass immunizations, health services, and nutrition programs, help contribute to children's well-being.²³

Family planning contributes indirectly to children's health, development, and survival by reducing the risk of maternal mortality and morbidity. The death of a mother is traumatic; losing a mother has an immense impact on the emotional well-being of the family

members that survive her. It also may affect the physical health of her survivors since many women earn a living and most are directly involved in the hygiene and health care of children.

Family planning contributes directly to the survival, health, and development of children in three ways:²¹

- Encouraging women to space births at least 2 years apart
- Planning births during the mother's optimal age—not too old or too young
- Preventing further pregnancies in a mother who has had numerous pregnancies already

SPACING BIRTHS

Infants born at least 24 months after the previous birth in their family have lower mortality rates than children born at shorter intervals. (See Table 1:5.) The exact reasons why birth spacing saves lives are not fully understood, but experts suggest that it improves infant birthweight and child nutrition.

A pregnancy occurring too soon after a previous pregnancy may result in a spontaneous abortion, a stillbirth, or a low-birthweight baby who is much less likely to survive. On average, babies born less than 2 years after the previous birth in the family are about twice as likely to die in the first year as babies born after at least a 2-year interval.²¹

Even older children who are spaced too closely face an increased risk of death during the toddler and childhood years. Closely spaced siblings compete for food and other resources. A young child may be weaned too soon because the mother stops breastfeeding when she becomes pregnant with another child. This practice has long been recognized in some societies and has even found its way into the language through the word "kwashiorkor," which means "the child displaced from the breast too soon" because the mother is pregnant again.²⁷ Children born within 2 years of a previous child are 1.3 times more likely to die between the ages of 1 to 5 years than those born after a longer interval.²⁰

Table 1:5 Estimated average mortality rates for children born to women with two kinds of reproductive patterns

	Mortality rate per 1,000 live births	
	Good spacing pattern	Poor spacing pattern
Teenage mothers	92	165
Mothers ages 20-34	67	120

Source: Hobcraft (1989)

PLANNING BIRTHS DURING OPTIMAL MATERNAL AGE

Women who are very young or very old are more likely to have an infant or child who dies:

- Children of teenagers are 1.2 times more likely to die during the neonatal period, 1.4 times more during the postneonatal period, 1.6 times during ages 1 to 2, and 1.3 during childhood to age 5.²⁰
- Children of older mothers are more likely to be born with congenital abnormalities, including Down's syndrome, heart defects, and cleft palate and lip.¹¹

However, these congenital anomalies are a relatively minor cause of infant death in developing countries.⁹ Most of the excess death associated with older maternal age is probably linked to the additional risk associated with a greater number of births an older woman will likely have had.

PREVENTING A LARGE NUMBER OF PREGNANCIES PER WOMAN

The eventual size of the family directly affects an infant's or child's chance for survival because it determines what proportion of the family resources and food each child receives. Studies also show that birth order affects the nutritional status of a child. In many areas of the world, families know too well the effects of limited resources

such as food. More children means more mouths to feed, and the more mouths to feed, the less food for each. The third, fourth, and subsequent children are likely to eat fewer calories and proteins, thus making them more susceptible to illness, including fatal illness. Much of the risk associated with high birth order is probably the result of close birth spacing.²⁰ On average, the seventh or later child has a smaller chance for survival than a child who has a lower birth order.¹²

FAMILY PLANNING BENEFITS WOMEN AND THEIR SOCIETIES

Family planning reduces health risks of women and gives them more control over their reproductive lives. With better health and greater control over their lives, women can take advantage of education, employment, and civic opportunities.

In delivering family planning services, providers have a unique opportunity to enhance the lives of women:¹⁹

- **Help women learn to make informed choices.** In many countries, women report they have little or no say in decisions about having children. Women need to learn how to make these decisions and gain confidence in their abilities so that they can apply their decision-making skills and confidence to other arenas in their lives.
- **Support women's choices.** The provider needs to listen to and encourage women. The provider can give information, engage women in discussion, help them recognize their needs and desires, and answer questions. When the woman makes a decision, the provider can acknowledge its value.
- **Encourage women to recognize their strengths and build on them.** Through counseling, women can recognize their abilities: performing household chores, planning their time, saving money or food staples, caring for their children, helping their husbands and in-laws, and supporting their friends and neighbors.

- **Improve women's skills in communicating with their husbands and with people outside their families.** The provider can help establish avenues for communication during joint discussions with the wife and husband. The couple's improved communication will increase the adoption of contraception as well as the continuation and more successful use of the couple's chosen method. Ideally, communication about family planning also will open opportunities for discussion about other issues in the couple's lives. Women's discussion groups are useful in helping women feel respected and less isolated. These groups can consider ways to discuss issues with husbands.
- **Create new images and models of competent women and caring men.** By treating and portraying women as competent and men as caring, family planning workers can help men and women adopt and accept these perceptions.

Throughout the world, not just in Africa, women suffer from having a lower status than men. They have fewer rights, lower salary levels, under-representation in politics and decision-making positions, less economic power, and inadequate protection from violence.² The Program of Action adopted by the delegates of the International Conference on Population and Development, held in Cairo, Egypt, calls for an end to discrimination against women:²⁵

- Ensure that women can have economic parity with men: property ownership, credit, right to negotiate contracts, and right to inheritance.
- Eliminate discrimination against women in the workplace and in educational institutions.
- Eliminate violence against women in the home and the community in times of war and of peace.
- Enact laws to remove barriers to the advancement of women.

*The woman's place is not in the kitchen anymore;
her place is everywhere there is human activity.
The hour has come to revisit our prejudices against women.*
— Brigadier General G. Miyanda, Vice President of Zambia

FAMILY PLANNING IN AFRICA

Sub-Saharan Africa has the lowest rate of contraceptive use in the world. Several factors have contributed to this low rate: difficulty in getting contraceptive supplies, not enough family planning clinics, a largely rural population, low socioeconomic levels, high rates of infant and child mortality, and the high value many cultures place on large family size.

The percentage of married women of reproductive age using contraception ranges from 4% in Niger to 48% in Zimbabwe to 75% in Mauritius.³⁰ (See Table 1:6.) Less than 20% of women use a contraceptive in Burkina Faso, Madagascar, Malawi, Niger, Nigeria, Tanzania, Togo, and Uganda. In contrast, the rest of the developing world, excluding China, has a contraceptive use rate of 43%; the developed world has a rate of 68%.

As contraceptive use increases, total fertility rates decrease. In Kenya, for example, contraceptive use increased threefold during the 1980s, a rise associated with a decrease in family size from 8.3 to 6.5 children per woman.⁵

As contraceptive use increases in Africa, so will family survival. Planned pregnancies, which are generally safer for the mother, produce children who are usually healthier than children from unplanned pregnancies. Sub-Saharan Africa stands out as the region having the highest unmet need for contraception in the world.³ (Most recent estimates of unmet need include women not using any contraceptive method who state they want to space out their children or that they have reached their desired family size and wish to have no more children. See Table 1:7.)

The woman with an unintentional pregnancy is less likely to receive prenatal care, which is instrumental in reducing the risks of pregnancy for both mother and child. The child of an unwanted conception is at greater risk of being born at low birthweight, dying in the first year of life, and not receiving sufficient resources for healthy development.¹³ Family planning is vital to family health.

REPRODUCTIVE LIFE PLAN

Family planning allows individuals and couples to plan at least one aspect of their lives: whether and when to have children and how many. Such planning increases the likelihood that mothers and their children will enjoy the health benefits of birth spacing and having intentional, rather than unintentional, pregnancies.

Every person, whether from a traditional or modern culture, already has at least a partially developed reproductive life plan. Cultural expectations about when to marry, when to bear children, and how many children to have can be strong and can form a person's future. In the process of accepting or challenging these expectations, a person is actually forming a reproductive life plan.

Table 1:6 Family planning methods currently used (in percentages) by married women of reproductive age, 18 African nations

Country	Any method	Trad. methods	Modern methods	Sterilization		OCs
				Female	Male	
Burkina Faso	10	6	4	<1	0	2
Cameroon	14	10	4	1	0	1
Egypt	47	2	45	1	0	13
Ghana	20	10	10	1	—	3
Kenya	33	6	27	6	0	10
Madagascar	17	12	5	1	0	1
Malawi	13	6	7	2	0	2
Namibia	30	3	26	7	<1	8
Niger	4	2	2	<1	0	2
Nigeria	6	3	4	<1	0	1
Rwanda	21	8	13	1	0	3
Senegal	7	3	5	<1	0	2
Tanzania	18	5	13	2	—	6
Togo	12	9	3	1	0	1
Tunisia	51	9	41	10	0	9
Uganda	15	4	9	1	—	3
Zambia	26	12	14	2	0	7
Zimbabwe	48	6	42	2	<1	33

Table 1:6 Family planning methods currently used (in percentages) by married women of reproductive age, 18 African nations —Continued

IUDs	Condoms	Injectables	Vaginal	Periodic abstinence	Withdrawal	Other
1	1	<1	<1	4	0	2
<1	1	<1	<1	7	2	1
28	2	1	<1	1	1	<1
1	2	2	1	8	2	1
4	1	7	<1	4	<1	1
1	1	2	<1	9	2	<1
<1	2	2	<1	2	2	2
2	<1	8	<1	1	<1	2
<1	<1	1	0	<1	<1	2
1	<1	1	<1	1	1	1
<1	<1	8	0	5	3	1
1	0	0	0	1	0	2
1	1	5	—	2	3	1
1	0	0	1	7	2	0
18	1	1	1	7	3	1
<1	1	3	0	4	1	3
1	4	1	<1	2	5	5
1	2	3	0	<1	4	2

Sources: Bureau of Statistics [Tanzania] (1997); Central Statistical Office [Zambia] et al. (1997); Central Statistical Office [Zimbabwe] (1995); Curtis SL and Neitzel K (1996); El-Zanaty F, et al. (1996); Statistics Department [Uganda] 1996.

Table 1:7 Percentage of currently married women with a potential demand for contraception

Region	Potential demand	Current users (met need)	Nonusers (unmet need)	Proportion of demand satisfied
Sub-Saharan Africa	38.9	15.9	23.0	0.41
North Africa/ Middle East	59.8	40.9	18.9	0.68
Asia	60.8	46.7	14.1	0.77
Latin America	67.2	47.8	19.4	0.71

Potential demand = current users (met need) + nonusers (unmet need)

Source: Bongaarts and Bruce (1995)

Reproductive life plan

1. Would I like to have a child in the future?
2. How many children would I be happy having?
3. What are the things that I would like to achieve most in life, and by when?
4. Of all the things I could do in life, what might be the most important to accomplish?
5. This goal would be affected by or would affect childbearing in what ways?
6. How old would I like to be when I have my last child?
7. How concerned would I be if I were to become pregnant before I was ready?
8. What would I do if I were to become pregnant before I wanted to?
9. How compatible is my life plan with my religious beliefs, my husband's (or wife's), my community's?

Choices are essential to human dignity. Without choices and without opportunities, a person cannot hope for a better future. Without choices, a person can have little self-respect. A person imprisoned is punished by being denied choices; a person denied choices is punished even without being imprisoned.¹⁹

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Traditional Practices

Kaway had been blessed with as many boys and girls as she wanted. Although her husband Kantinka had thought he would want more children, he agreed that adding more members to the family would be more of a burden than a help. He could remember times when water and food were scarce, and he feared for the children he already had and loved. On the advice of a village elder, he and Kaway placed herbs in her vagina before intercourse. However, it soon became clear that the herbs did not work, as another baby was on the way.

Each society hands down traditions from generation to generation by teaching certain attitudes, practices, beliefs, legends, customs, and habits. There are traditional beliefs and practices in all areas of life, including reproduction. Throughout history, the traditional family planning practices used to space children have been rich and varied.² The creative and occasionally life-threatening techniques used to limit childbearing show how intensely women and men have tried to control reproduction and sexual practices.

WHAT ARE THE TRADITIONAL METHODS?

Modern family planning methods are an extension of the traditions described in the chapter. Although modern methods are more effective

and sometimes safer than most traditional methods, many traditional methods continue to be widely used. Many of the traditional methods may be ineffective; others are harmful.

The rapid rates of modernization, urbanization, and social change experienced in African countries make it difficult to determine how often traditional methods of fertility regulation are still used. Reports from earlier in this century indicate that use of these methods was widespread. More recent reports suggest their use continues, at least to some degree. Among the traditional methods, withdrawal is the most commonly practiced.⁸ (See Chapter 19 on Coitus Interruptus.) Table 2:1 shows the percentage of women who use a modern method and the percentage who use a traditional method. In Ankole, Uganda, for example, about one-third of women have used traditional methods.⁶

How important these traditional practices are to your clients will depend to a large extent on where you provide family planning and other maternal and child health services. People working in urban clinics and hospitals will probably see fewer individuals who actively use traditional approaches to child spacing. On the other hand, health workers in rural settings are more likely to provide services to women who frequently use traditional means to regulate their fertility. Some rural providers may themselves use traditional methods and believe them to be effective.

Table 2:1 Family planning methods currently used (in percentages) by married women of reproductive age

Country	Any method	Traditional methods	Modern methods
Burkina Faso	10	6	4
Cameroon	14	10	4
Egypt	47	2	45
Ghana	20	10	10
Kenya	33	6	27
Madagascar	17	12	5
Malawi	13	6	7
Namibia	30	3	26
Morocco	42	6	36
Niger	4	2	2
Nigeria	6	3	4
Rwanda	7	3	5
Senegal	7	3	5
Tanzania	18	5	13
Togo	12	9	3
Tunisia	51	9	41
Uganda	15	4	9
Zambia	26	12	14
Zimbabwe	48	6	42

Source: Robey et al. (1992)

BEHAVIORAL PATTERNS

Abortion has concerned people for centuries, and it has been employed, to some degree, in most societies. Perhaps more important than traditional contraceptives and abortifacients are the cultural practices related to reproduction and sexuality that affect fertility. See Table 2:2. In the most desperate of circumstances (in Africa and elsewhere), unwanted offspring have been subject to infanticide, and women pregnant outside of marriage have been disowned and, in rare circumstances, put to death. These practices can only be condemned and must be actively extinguished.

Table 2:2 Traditions that may decrease fertility in a society

-
- Traditions encouraging *breastfeeding*
 - Traditions leading to *abstinence*
 - *Mechanical, spermicidal, and systemic preparations that prevent pregnancy*
 - Traditional practices causing *abortions* or *infanticide*
 - Societal traditions causing *infertility*
 - Traditions leading to *death of women who are pregnant or who have intercourse outside marriage*
-

TRADITIONS LEADING TO BREASTFEEDING

Among the African nations, there is a tremendous range in the percentage of people who rely on breastfeeding for contraception. Because lactation has definite contraceptive effects and is so widespread, it is one of the most important contraceptive methods currently limiting female fertility. (See Chapter 12 on Lactation and Postpartum Contraception.) In addition, many cultures discourage sexual intercourse while the mother is breastfeeding. Surveys indicate that lactation and postpartum abstinence are still important in their effect on fertility in some parts of Africa.

TRADITIONS LEADING TO INCREASED ABSTINENCE

A number of customs and traditions increase the likelihood of abstinence in a society. The culture may encourage postpartum abstinence for a variety of reasons, ranging from multiple wives (polygamy) to concern about postpartum infection, healing of the episiotomy (or tear), or maternal depletion syndrome. Because of mistaken notions that semen pollutes breast milk or that sexual intercourse causes malnutrition in the suckling infant, abstinence may also be practiced to space births so that each child will receive enough breast milk to survive.

In addition to abstinence after childbirth, and especially during breastfeeding, there are other culturally mandated periods of abstinence that affect fertility. The value placed on virginity in many areas prohibits the beginning of sexual activity until a girl is married. In some areas, women are supposed to abstain indefinitely from intercourse once they have become grandmothers. Thus, there are areas in Africa where abstinence shortens a woman's reproductive period at both ends of her reproductive life span, determining when she becomes sexually active as well as when she stops.

TRADITIONAL METHODS THAT PREVENT PREGNANCY

Without a clear understanding of the process of pregnancy, women and men worldwide have tried countless methods to avoid pregnancy. The traditional methods outlined in Table 2.3 highlight the human potentials for ingenuity and playfulness, as well as for frustration and desperation.

Table 2:3 Ineffective or unsafe traditional methods

Mechanical barriers

- Sponge and spongy substances
- Lemon halves, shelled out and placed over cervix (similar to cervical cap)
- Linen pads in vagina
- Crocodile or elephant dung
- Condom-like materials: cecum and bladder of various animals, linen sheaths, receptacles shaped like condoms that are placed into vagina

Spermicidal materials: Lemon juice; cola drinks; vaginal pill made of tannic acid; pastes and gums of honey, natron, sodium bicarbonate, oils, ground betelnut

Douches of alum, white oak bark, hemlock bark, red rose leaves, raspberry leaves, roots, zinc sulphate, sodium bicarbonate, coca cola

Removal of semen from vagina by mechanical methods (such as wiping with a cloth or jumping up and down)

Pessaries or suppositories

- Gold ball at the base of the "temple of love"
- Block pessary with 4 concavities
- Beeswax
- Opium ball
- Stones placed in the uterine cavity

Systemic preparations

- Cup of roots to make woman sterile, such as worm fern roots
 - Sabine (*Juniperus sabina*) to prevent conception
 - Marjoram, thyme, parsley, and lavender teas
 - Willow tea
-

SOCIETAL TRADITIONS CAUSING INFERTILITY

Historically, certain societal traditions have increased the likelihood of male or female infertility.

Prostitution can increase a woman's risk for sexually transmitted infections, which can lead to pelvic inflammatory disease (PID) that, in turn, may contribute to infertility. Prostitution has also contributed to the transmission of acquired immune deficiency syndrome (AIDS).

Female genital mutilation (circumcision) has caused serious PID and infertility in women because of infectious complications that frequently follow the genital mutilation procedure. Some of these procedures merely entail removing the prepuce of the clitoris and the posterior, larger parts of the labia minora. A more extensive procedure called "excision" or "reduction" removes the glans and the adjacent parts of the labia minora. The most extensive procedure is called "excision and infibulation." The entire clitoris, all of the labia minora, and part of the labia majora are surgically removed, and the vaginal opening is almost entirely closed. Female genital mutilation is still commonly practiced in Africa, where more than 110 million women have been circumcised.¹

These operations are rarely performed by medical personnel, and complications can be very severe. One of the significant long-term complications is impaired sexual functioning. A study in Egypt compared 1,900 circumcised women with a similar group of uncircumcised women. Half (50%) of the circumcised women reported having difficulty in permitting penile penetration or suffering pain during intercourse. Fifty-six percent of these women failed to achieve orgasm during intercourse. Perhaps because of these problems, 60% of the circumcised women engaged in sexual intercourse far less often than did women who were not circumcised.⁴

Male genital mutilation (castration) of men (making them eunuchs) was an ancient practice that rendered them incapable of impregnating women.

PLANTS AND OTHER SUBSTANCES

Locally available plants have traditionally been used in a variety of ways to control fertility. More than 500 different plants and substances in Africa have been used as abortifacients or contraceptives.

Plants are used in other ways as well. The oil of the seeds of *Buchholzia macrophylla* is said to have an estrogenic effect and has been used by women in Zaire to reduce menstrual flow.² Many plants, either drunk as teas or rubbed on the breasts, are used by women to stimulate the flow of breast milk. Other plants are used as spermicides,⁶ contraceptives,¹⁰ or labor-inducing agents.⁹

Women often place household substances such as aspirin, lemon juice, and black pepper into their vaginas prior to intercourse.⁵ Women may also place substances, many of which can be harmful, in their vaginas following intercourse. These douches may contain hot water with salt, vinegar, lemon juice, alum, soap, or potassium.³

WHAT TO DO?

Family planning providers must ask clients whether they have been using a traditional practice. Assess the effectiveness and safety of these practices as well as their compatibility with the various modern methods of contraception. Some clients may find modern methods easier to understand when they are compared to the beliefs about traditional methods.

While traditional practices are slowly disappearing, there is ample evidence that some traditional forms of fertility regulation are still fairly common. As one who delivers family planning services, you must be able to determine whether a woman is using a traditional method to regulate her fertility, whether she is using the method conscientiously and effectively, and whether use of the method is causing her any problems. Only when you have these facts will you be in a position to help her make family planning decisions that she will be able to carry out with confidence.

DOES THE CLIENT USE A TRADITIONAL METHOD?

Ask the client whether she uses any means to space her births. These questions may serve as a guideline:

- Do you breastfeed your children? How long will you breast-feed before you begin to supplement the child's diet? How long will you breastfeed before weaning the child completely?
- Do you completely abstain from sexual intercourse while you are breastfeeding? How long will you abstain? How long are you supposed to abstain?
- Do you use any means of contraception at all, especially methods that you have not received from a clinic or health professional?

If the woman answers "yes," and she breastfeeds and abstains for a substantial period of time after giving birth, she is probably a family planner. Additional information is needed; specifically, you must determine how reliably this woman adheres to traditional family planning practices or the lactational amenorrhea method (LAM, see Chapter 12 on Lactation and Postpartum Contraception), and how effective her method of choice is.

WHAT ARE THE CLIENT'S PLANS FOR FAMILY SIZE?

Use these questions as a guide to getting the extra information you need:

- How many children do you have? How many do you and your partner want to have?
- How far apart are your children in age? How far apart should children be spaced for health or economic reasons?
- How long will it be before you want to have another child?

If the woman has more children than she intended or if her children are more closely spaced than she had desired, recommend a modern method of contraception. The traditional method she has used may have required long periods of sexual abstinence that she and her husband have found difficult. Modern contraception may be easier for her to use and will allow her greater sexual activity.

If the answers to these questions reveal that the woman is controlling her fertility to her satisfaction through traditional means, you need to investigate the safety of her method. This step may be more difficult. If the woman is effectively spacing her births through a combination of breastfeeding and abstinence, there is nothing safer. If this is the case, the best course of action is probably to recommend a barrier method of contraception as a backup to her traditional practices. For example, you might recommend that the woman use foam or condoms just in case her or her husband's resolve to abstain should weaken.

Completely replacing her traditional practice with a modern method of contraception may not be productive. In many places, particularly in rural areas, there are still difficulties in maintaining a consistent supply of contraceptives. If you cannot guarantee that your client will be able to obtain the supplies she needs, you may be doing her a disservice by disrupting her traditional practices and replacing them with interrupted coverage from modern contraceptives. Furthermore, some types of oral contraceptives (the combination pills) should not be prescribed to lactating women. If used improperly, they can decrease the milk yield and shorten the period of lactation (see Chapter 12 on Lactation and Postpartum Contraception and Chapter 13 on Combined Oral Contraceptives). In cases where the period of sexual abstinence is directly related to breastfeeding, improper use of a combination pill could expose a woman to another pregnancy sooner than if she had followed her traditional practice.

In the case of traditional contraceptives, however, it is difficult to determine how safe they are for the user. There are many types in use and many different means of using them. Active agents have not been identified for many of these substances. The decision about the safety of these methods must be *yours*. If you have any doubt at all about the safety of her contraceptive, recommend a modern method.

IS THE CLIENT WILLING TO SWITCH FROM TRADITIONAL TO MODERN?

In general, if a woman is willing to use a traditional contraceptive, she may be willing to use a modern method, especially one that is similar. For example, women who are accustomed to using traditional barrier methods that require vaginal insertion may be more willing to switch to a diaphragm or foam. Similarly, women who use traditional methods that are taken orally may be candidates for the pill. Stressing the overall effects on her health may convince her to switch to a modern method.

Before you recommend such a switch, however, you should try to determine how receptive the woman is to changing her method and using modern contraception. If she is resistant to change, try to determine the source of that resistance. Consider the following questions in each case:

- Will giving the woman contraception put her in disfavor with her husband? Is he aware that she is receiving care at your clinic?
- Will it open her to criticism from the other women in her group?
- Will she be in disfavor with her mother? Her mother-in-law? Her grandmother?
- Does she have the freedom to get to the clinic when she needs to, or is it difficult for her to leave her household?

If the woman appears to be socially free to use modern contraception, recommend that she do so. If she is not socially free, your responsibility goes beyond providing contraceptive services. Counsel her about the pressures she encounters, reinforce her decision to use a modern method, and help her develop good justifications for the use of her method. Assure her that she can contact the health clinic for further reassurance, for answers to questions, or for help in discussing with others their concerns about her use of the contraceptive. It is preferable to schedule a return visit, even if her method of choice does not require it, to check on her progress and to help her with any problems—medical or social—she may be having with its use.

It is difficult to make comprehensive recommendations to all women regarding the use of traditional family planning methods. The preceding series of questions are intended to help you arrive at a suitable solution. Whatever the method, it must be not only safe and effective, but also suitable for the woman so that she continues to use contraception effectively.

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Dynamics of Reproductive Behavior and Population Change

*People are the most important and
valuable resources of any nation.*

— Principle 2

*Population-related goals and policies are integral parts
of cultural, economic and social development, the principal
aim of which is to improve the quality of life of all people.*

— Principle 5

Cairo Conference on Population and Development ²⁴

In Benin, Côte d'Ivoire, Mali, Niger, and Uganda, the typical woman who survives to age 50 will give birth to more than seven children; her life expectancy at birth ranges from a low of 46 years in Uganda to a high of 52 years in Côte d'Ivoire. In contrast, the average woman in the United States will bear just two children in a lifetime that will last about 79 years.⁹

Why should these statistics concern family planning practitioners? The principle of voluntary family planning demands that individuals have the right to achieve their reproductive life goals, whatever they may be, but individual reproductive behaviors also have aggregate consequences, because they influence the health and determine the fertility of a population.

It is only natural that those involved in family planning and reproductive health would want to understand how the use of contraception, the effectiveness of various contraceptive methods, the prevalence of abortion, and the duration of breastfeeding affect fertility in a population. Fertility, however, is only one cause of population change. This chapter also briefly considers the two other causes of population change: mortality and migration.

CAUSES OF MORTALITY

As living conditions in a country improve, the causes of death shift dramatically.¹⁸ In developing countries, the major causes of death are infectious diseases. In developed countries, causes of death are concentrated among degenerative diseases such as cancer and cardiovascular disease. This shift occurs primarily because infant and child mortality are much higher in developing countries. Poor nutrition makes children more susceptible to infection and less able to withstand illnesses that otherwise would not prove fatal. Improvement in living conditions implies better nutrition, sanitation, water supply, and access to public health measures such as vaccination against tetanus, measles, and other common diseases. With such improvements, children survive to adulthood, when degenerative diseases become the primary causes of death.

Reproductive and sexual behavior affect mortality in three major ways:

- The number of children women bear, the ages at which they bear children, and the length of intervals between births all affect maternal and infant health.¹⁶ Short intervals between births are associated with higher rates of infant, child, and maternal mortality. Reducing the number of children that women bear would reduce maternal morbidity and mortality. (See Chapter 1 on Benefits of Family Planning).
- Breastfeeding significantly lowers the risk of infant and child death.²⁶

- Unprotected sexual intercourse increases the risk of sexually transmitted infections (STIs), including the human immunodeficiency virus (HIV). Pregnant women infected with HIV may transmit the infection to their infants during pregnancy or childbirth or through breast milk. By the year 2000, as many as 110 million adults worldwide will be infected with HIV. By the end of this century, 90% of all HIV infections will be in developing countries.¹² The impact on infant and child mortality rates and on population growth is devastating in certain areas of the world, particularly sub-Saharan Africa and Asia. (See Chapter 5 on HIV, AIDS, and Reproductive Health.)

DETERMINANTS OF FERTILITY

The estimated population of the world in mid-1995 was 5.702 billion, and the world population is currently growing 1.5% per year.⁹ In 1995, approximately 86 million people—a number comparable to the populations of Mexico (94 million) and Germany (82 million), the eleventh and twelfth largest countries in the world—were added. At the current growth rate, the increase in population is substantial:

- 234 thousand more people every day
- 10 thousand more people every hour

Should this growth of 1.5% continue, the world's population will be 12.0 billion in 50 years, and it will be 25.3 billion in 100 years. Of course, such growth could not continue indefinitely. Indeed, the annual growth rate has fallen after peaking at 2.06% per year in the period of 1965 to 1970.²⁵ Table 3:1 shows the population size and rate of growth for various countries, including those in Africa.

Why is fertility high in some populations and low in others?

Childbearing ages have biological limits. Between menarche and menopause, a woman has about 35 years in which she can produce children. These limits constrain fertility, and they vary somewhat among populations. Childbearing spans can range from about 32 to 39 years.⁷ For several reasons, however, the fertility impact of this difference of 7 years is likely to be small, at most a difference of one child over a lifetime, and possibly much less.⁸

Different populations vary in the proportion of females at each age who are sexually active and therefore exposed to the risk of pregnancy. In many populations, sexual intercourse is confined primarily to marriage. Thus, age at marriage, the proportion of women ever marrying, and patterns of divorce and remarriage are powerful causes of fertility levels. Increasing women's age at marriage lowers total fertility by removing younger women from the risk of childbearing and raising the age at which women bear children, thereby lowering the annual population growth rate by lengthening the time between generations.²³ Raising the age at marriage has other effects as well. The most important is to enhance the status of women, allowing them to stay in school longer to acquire job-related skills, to work outside the home before marriage, and to enter marriage with more physical and emotional maturity and financial security. Such social changes are themselves likely to stimulate a demand for fertility control.¹⁰ Because raising the age at marriage so profoundly alters the social fabric, governments may be unwilling or unable to use this potential instrument of public policy.

Both the spacing between the initiation of sexual activity and the first live birth and the spacing between one live birth and the next vary across populations. The shorter the average interval between births, the greater the number of births that can be squeezed into the childbearing span.

The birth interval can be divided into three parts: the period of postpartum non-susceptibility following a birth during which a woman is not at risk of conception, the waiting time to a conception leading to the next live birth once she returns to risk; and the gestation

period itself.¹⁴ The last part, the pregnancy period, does not vary from population to population. The other two parts vary considerably.

EFFECT OF BREASTFEEDING AND CONTRACEPTION

Consider a typical developing country in which contraceptive use is low but prolonged breastfeeding is nearly universal. Postpartum non-susceptibility lasts an average of 12 months. When not using contraception or breastfeeding, young wives typically take about 6 months to become pregnant (also called waiting time to conception). Pregnancy lasts 9 months. In such cases, the interval between one birth and the next is $12 + 6 + 9 = 27$ months, or 2.25 years. The average fertility rate per year is therefore $1/2.25$, or 444 births per 1,000 sexually active women.

A common effect of modernization is a decrease in breastfeeding but an increase in use of contraception. However, the decrease in breastfeeding often occurs before the increase in the use of contraception.

What if breastfeeding were completely abandoned in our typical population? The period of postpartum non-susceptibility would decrease to only 2 months. In this case, the typical interval between births would also decrease to $2 + 6 + 9 = 17$ months, or 1.42 years. The average fertility rate among sexually active women would rise to 706 births per 1,000 sexually active women, a rate 59% greater than the 444/1,000 among breastfeeding women. Obviously, breastfeeding has an important contraceptive effect in a population, even though no individual woman may dependably rely on it to prevent pregnancy for very long. (See Chapter 12 on Lactation and Postpartum Contraception.)

As the use of contraception increases, the interval between births lengthens. If all women used contraception that reduces the monthly risk of pregnancy by 80%, the waiting time to conception would rise to 30 months. This rise would more than make up for the decrease in postpartum non-susceptibility. The interval between births would be $2 + 30 + 9 = 41$ months, and the fertility rate would fall from 706 to 293 births per 1,000 sexually active women.

EFFECT OF ABORTION

Many people assume that one abortion will prevent one birth, but we can easily demonstrate that this statement is false. Return to our developing country with a birth interval of 27 months among young women (a period of postpartum non-susceptibility of 12 months, 6 months to get pregnant, and a pregnancy of 9 months). Imagine that every other pregnancy is aborted. In that case, the waiting time to conception would consist of the following: 6 months to get pregnant the first time, 3 months of pregnancy until the abortion, 1 month of postpartum non-susceptibility following the abortion, and 6 more months of waiting until the next pregnancy. The total waiting time to conception would be 16 months. Compare this waiting time with the regular waiting time to conception among young wives, which is only 6 months. Thus the waiting time to conception is 167% longer for someone who aborts a pregnancy than for someone who does not abort.

However, the birth interval for someone who aborts (12 + 16 + 9 months) increases by only 37%, from 27 to 37 months. Therefore, if every other pregnancy is aborted, the fertility rate would decrease by only 27%, not by 50% as one might initially expect. The reader may object that an abortion certainly prevents one birth. However, this way of thinking ignores the fact that the next birth occurs sooner when a pregnancy is aborted than when it results in a live birth. In summary, while an abortion prevents a particular birth, it reduces the woman's lifetime births by less than one if her reproductive behavior does not otherwise change.

EFFECT OF STIS

STIs have major effects on fertility in selected populations.²⁰ Syphilis is an important cause of fetal loss among women and causes primary or secondary infections; it also may contribute to low fertility among certain tribal groups in Burkina Faso and the Central African Republic.⁷ Untreated pelvic inflammatory disease (PID) is a major cause of sterility. The low fertility rate characteristic of Central Africa

(a belt extending from the west coast of Cameroon and Gabon through northern Zaire into southwest Sudan) is thought to be associated with a high prevalence of gonorrhea.¹

EFFECT OF NUTRITION

When food supplies are so short that there is famine and starvation, fecundity, and hence, fertility are reduced. But when malnourishment is chronic and food intake is above starvation levels, there does not appear to be an important link between nutrition and fertility.¹⁵

MIGRATION

Migration is linked to economic, social, and political conditions. When assessing the determinants of migration, investigators have traditionally emphasized "push" and "pull" factors. Push factors include extraordinary events such as wars, floods, famines, and political/religious persecutions as well as more ordinary circumstances associated with depressed economic settings: high unemployment, low wages, and little hope.

Pull factors attract people to a location. They often are associated with economic opportunity: good jobs, high wages, and good public services such as education and health care. They also may include an attractive environment, religious freedom, and proximity to family or members of one's own ethnic group.

FERTILITY TRANSITION

The historical record suggests a relationship, although a loose one, between socioeconomic modernization and fertility decline. But history also shows an important diffusion aspect to the practice of fertility control.^{5,11} Allowing couples to decide the number of children they want to have and providing information and technical assistance to give meaning to this right, particularly when coupled with advances in

the status of women, could sharply reduce fertility.^{4,19} Many women in developing countries desire increased spacing between children or termination of childbearing, according to considerable evidence from surveys.²⁷

Voluntary family planning can play an important role in aiding a nation's development.^{13,17,28} Although slower population growth would benefit development in most developing countries, it would not automatically make poor countries rich. However, involuntary family planning might well undermine development.

Experience in China illustrates an alternative to voluntary family planning that is clearly effective in reducing fertility and the rate of population growth. However, it is unlikely that many other governments would have the authority to enforce China's compulsory policies. Recent experience with mass sterilizations in India suggests that coercive or compulsory policies to bring down the birth rate are more likely to bring down the government instead.

Government attempts to lower fertility too quickly can bring unintended consequences. From 1979 through 1983, the government of China vigorously promoted the policy of one child per family. What would be the consequences if the one-child policy were strictly adopted? By the year 2035, about 25% of the population would be aged 65 and over, versus only about 5% today.⁶ The traditional family structure would change radically in ways that would jeopardize the family's ability to care for the elderly and reduce its potential as a production unit; there would be no brothers, sisters, aunts, or uncles. The one-child policy may have already had the unintended side effect of causing female infanticide, due to a cultural preference for sons.^{2,3,29}

Finally, attempts to increase fertility can create great problems. In 1966, the government of Romania introduced pronatalist policies, including a decree banning virtually all abortions; in addition, importation of oral contraceptives and intrauterine devices (IUDs) was discontinued. The result was as instantaneous as it was stunning.^{21,22} Within 8 months the monthly birth rate had doubled; within 11 months it had tripled. Inadequate hospital care for the babies and their mothers caused infant and maternal mortality to rise sharply. As a consequence of unsafe illegal abortions, maternal mortality increased

to a level 10 times that in any other European country. In the 23 years the policy was enforced, more than 10,000 women died from unsafe abortions. Many women who did not resort to unsafe abortions bore unwanted children whom they placed in institutions. Such large-scale warehousing of children overwhelmed these institutions and severely degraded the quality of care. The educational system had to absorb a huge increase in students. Other problems, such as employment and housing, also arose. The government action certainly had the result of increasing fertility, but obviously the government had not thought clearly about the consequences. The policy was reversed immediately after the Ceausescu regime was overthrown in December 1989.

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Adolescent Women and Reproductive Health

For Alusa, the cost of pregnancy was great. She stopped going to school. No longer could she dream of a life of more opportunity. For Alusa, the cost of childbirth was pain. Her too small body tore. Now her husband turned away from her in disgust. She was only 16 years old, yet she bore the heavy burdens of an adult woman.

For most of human history, marrying early and having children soon thereafter have been expected events in a woman's life. Today, however, in Africa as elsewhere, more young women are enrolled in school. Increasing urbanization means that families have less need for large numbers of children. Traditional values have given way to more modern lifestyles and attitudes. In the past, adolescent childbearing was confined to marriage; today, early childbearing increasingly occurs outside of marriage.⁷ These rapid social changes have made adolescent fertility less acceptable. Adolescent fertility is not increasing in most African countries; however, Africa has the highest rates of adolescent fertility in the world.

In Africa, the social conditions that underlie early childbearing for women who live in rural areas differ from those for educated, urban women:

- **Young, rural women.** Social conditions in rural areas limit educational opportunities, and women marry young. Early marriage and, therefore, early childbearing are expected and even desired. However, having children early can have negative consequences because these young mothers are often physiologically immature and lack access to adequate health care.
- **Young urban, educated women.** Social conditions in urban areas promote education and delayed marriage. Premarital fertility is strongly discouraged because it may hurt a school-girl's future education and employment opportunities. However, because safe, legal abortions are generally not available in Africa, an adolescent's decision to terminate a pregnancy poses great health risks.

In most parts of Africa, high fertility is still valued, and motherhood may seem a more certain route to social standing than education.⁷ To date, much of the focus on adolescent fertility has centered on the health and educational consequences of early childbearing among a very small group of women, primarily unmarried women enrolled in school. However, married adolescents actually have higher birth rates. Because of rapidly changing circumstances and expectations, concern about early fertility may soon broaden to encompass married women as well.

THE MEANING OF ADOLESCENCE

Adolescence is not easily defined. In general, it is the period of life between childhood and adulthood. Demographers sometimes include only those aged 15 to 19; at other times, they include youth up to age 24. This chapter uses both age groups in presenting data. More than a demographic category, adolescence is a culturally defined phenomenon. It is a transition period that can influence a young person's future life course.

For African adolescents, increasing modernization has changed the course of this transition period. Today, extended families are frag-

mented, and elders traditionally responsible for educating and preparing young people for sexuality and parenthood are no longer able to communicate across geographic distances, different languages, or generations.^{11,26} More young women are enrolled in secondary school, yet strong normative pressures to become a parent persist.⁷

DEMOGRAPHIC LEVELS AND TRENDS

MARRIAGE BEFORE AGE 20

Marriage in Africa often involves a sequence of stages and steps rather than a clearly defined event.^{7,11} Thus, it can be difficult to determine the age at which a woman first "marries" or whether she is "married" when she gives birth. Many births defined as premarital occur among couples who eventually marry.

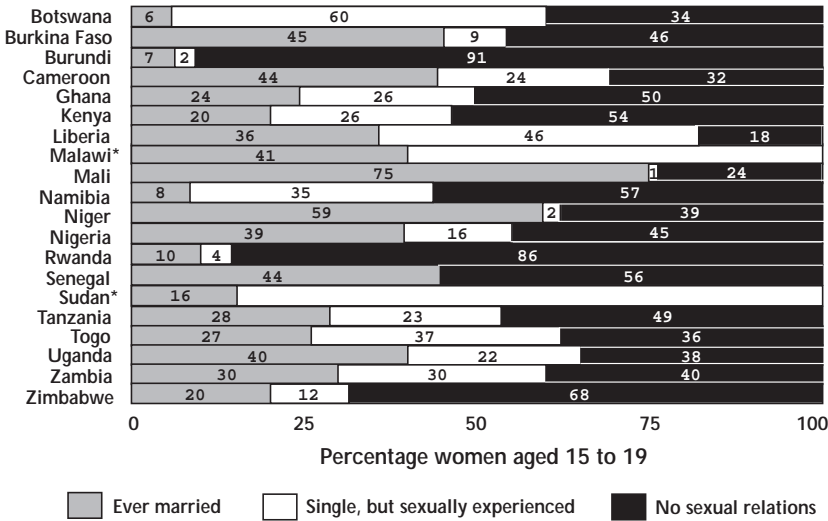
Most women in Africa marry before the age of 20 (see Figure 4: 1), especially in rural areas.¹¹ The highest rates of early marriage are in Cameroon, Benin, Ghana, Côte d'Ivoire, Nigeria, Mauritania, and Senegal, where between 70% and 80% of women marry before age 20.

The more education a woman receives, the later she marries. In Kenya, Ghana, Senegal, and Zimbabwe, for example, about one-third of women with secondary educations report marrying before 20, but more than three-fourths of women with no education report doing so.⁷

ADOLESCENT SEXUAL ACTIVITY

Large proportions of adolescent youth are sexually active (see Figure 4:1). Among urban women aged 20 to 24, three-fourths in Botswana, Liberia, Togo, and Uganda and two-thirds in Ghana and Kenya report engaging in premarital sexual activity before age 20. Adolescent exposure to intercourse varies by educational level; in Botswana, Burundi, Ghana, Kenya, Liberia, Nigeria, Togo, Uganda, and Zimbabwe, women who have attended secondary school are more likely than women with no schooling and women with primary education to report having engaged in premarital sex.⁷

Figure 4:1 Marriage and sexual experience among female adolescents



*Data on sexual experience of never-married women not available.
 Sources: Balepa et al. [1992]; Barrere et al. [1994]; Gaisie et al. [1993]; Katjuanojo et al. [1994]; Kourgueni et al. [1993]; Malawi National Statistical Office [1994]; Ngailaba et al. [1993]; Population Reference Bureau [1992]; Republic of the Sudan Department of Statistics [1991]

Rates of sexual activity are not likely to be greater among schoolgirls than among their married peers. However, sexual activity among unmarried adolescents is socially proscribed in most countries; thus, its occurrence draws greater attention. There is a good deal of debate over what motivates schoolgirls to enter and maintain sexual relationships. Both African and Western observers point to the weakening of traditional controls on adolescent sexual activity outside of marriage. Many traditional African societies transmit information and values about sexuality and family life through age-prescribed rites of passage or initiation ceremonies. As families move into cities, adolescents may be separated geographically from kin, who traditionally taught the young about values and life events. An adolescent's school and peer groups have replaced her kin group as the main socializing agents.^{7,11}

Traditional norms may be further eroded by adolescents' exposure to nontraditional values through novels, radio, and television as well as through formal schooling. Adolescent and older men may pressure young women to become sexually active. The phenomenon of "sugar daddies," older men who bestow gifts and money on young girls in exchange for sex, is almost universally noted in the literature.^{3,5,7,11,26} Young women may be forced into sexual relationships with teachers or older men to finance their educations.^{3,7}

BIRTHS BEFORE AGE 20

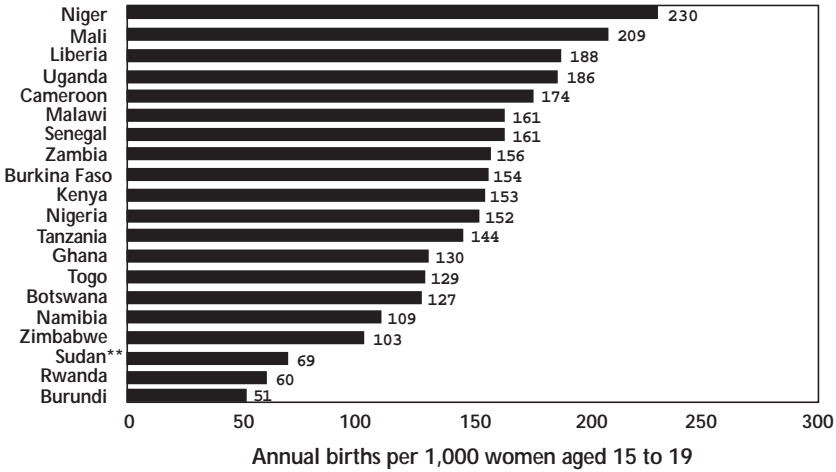
Adolescent fertility rates, presented in Figure 4:2, range from 51 per 1,000 in Burundi to 230 per 1,000 in Niger. In many countries, more than 20% of women aged 15 to 19 have given birth to at least one child (see Figure 4:3). In Nigeria, Mauritania, and Sudan, more than 15% of girls have given birth before age 15. However, in most African countries, the proportion of women giving birth before age 15 is much lower, ranging from about 3% in Benin, Ghana, and Mali to 7% in Kenya and Côte d'Ivoire. By age 20, most women in most African countries have given birth.²³

In some African countries, such as Burundi, Ghana, Kenya, and Zimbabwe, adolescent fertility actually appears to be declining. In other countries such as Botswana, Liberia, and Mali, adolescent fertility has increased dramatically.⁷

PREMARITAL BIRTHS AND CONCEPTIONS

The incidence of adolescent *premarital births* varies widely across Africa. Forty-three percent of women aged 20 to 24 in Botswana report having had a premarital birth, but in Mali, Burundi, Ghana, and Nigeria, the figure is less than 10%. In Kenya and Liberia, about one in five women aged 20 to 24 report having given birth before marriage.⁷

Figure 4:2 Female adolescent fertility rates*

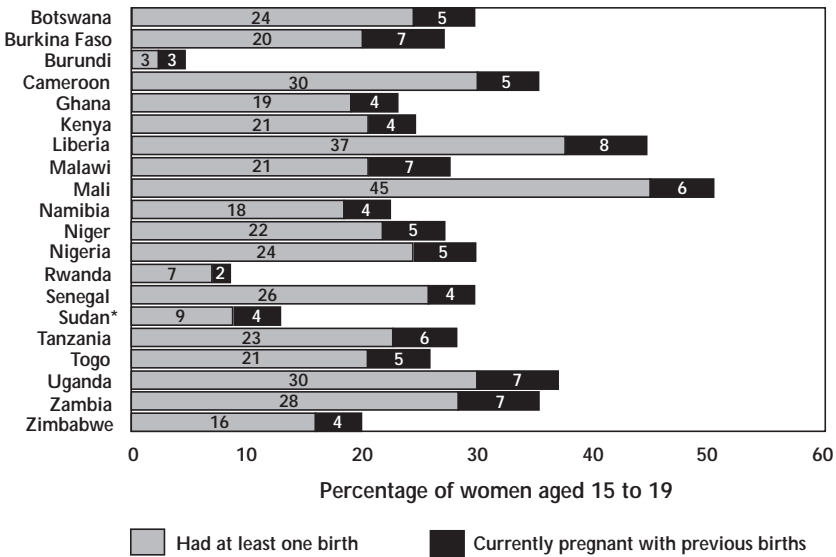


*During the three years before the survey in each country.

**Ever-married women only.

Sources: Balepa et al. [1992]; Barrere et al. [1994]; Gaisie et al. [1993]; Katjujanjo et al. [1994]; Kourgueni et al. [1993]; Malawi National Statistical Office [1994]; Ngailaba et al. [1993]; Population Reference Bureau [1992]; Republic of the Sudan Department of Statistics [1991]

Figure 4:3 Childbearing among adolescent women



*Ever-married women only

Sources: Balepa et al. [1992]; Barrere et al. [1994]; Gaisie et al. [1993]; Katjujanjo et al. [1994]; Kourgueni et al. [1993]; Malawi National Statistical Office [1994]; Ngailaba et al. [1993]; Population Reference Bureau [1992]; Republic of the Sudan Department of Statistics [1991]

The proportion of women experiencing a premarital birth by age 20 appears to be increasing in some countries. In Botswana, 34% of older women (aged 35 to 39) but 43% of women aged 20 to 24 report having had a premarital birth by age 20. Kenya and Liberia have experienced similar increases, with about 12% to 13% of women aged 35 to 39 but about 20% of women aged 20 to 24 reporting a premarital birth by age 20.

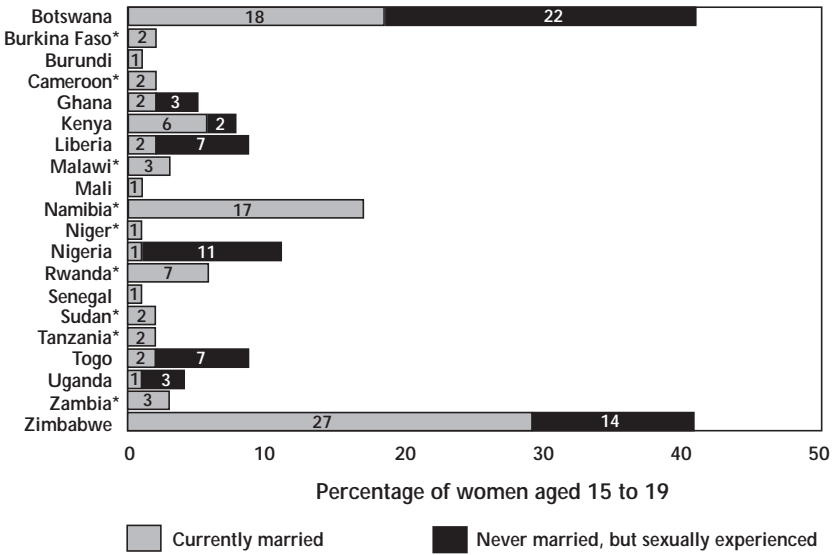
In Kenya almost half of all first births are premaritally conceived; in Benin, Cameroon, and Nigeria, the proportion is about one-third.²³ The first pregnancies of unmarried women are much more likely to be unintended than those of married women. In Botswana, Ghana, Kenya, Liberia, Togo, and Uganda, 51% to 87% of the first pregnancies of never-married women are unintended; the proportion for married women is about one-third.²¹

CONTRACEPTIVE KNOWLEDGE AND USE

Although a large proportion of women aged 15 to 19 report knowledge of a modern method of family planning, *contraceptive use* is generally low. More than three-fourths of adolescent women in Botswana, Kenya, and Zimbabwe and 50 to 75% of adolescent women in Ghana, Liberia, Senegal, Tanzania, Togo, and Uganda report that they know of a modern method (pills, injectables, intrauterine devices (IUDs), condoms, vaginal methods, and male and female sterilization).^{20,21} However, very few sexually experienced adolescents are currently using a modern method of family planning. (See Figure 4:4.) The low levels of contraceptive use among adolescents are paralleled by high estimates of unmet need for family planning. See Figure 4:5 for estimates of unmet need for several countries. In most, the unmet need for family planning is higher among sexually experienced but never-married women, who are eager to avoid unintended pregnancy.

Focus groups conducted with youth in Nigeria and Kenya reveal that, while many know of modern contraception and where to obtain it, they also rely on traditional methods or believe that modern contraception could harm the woman or man.⁵

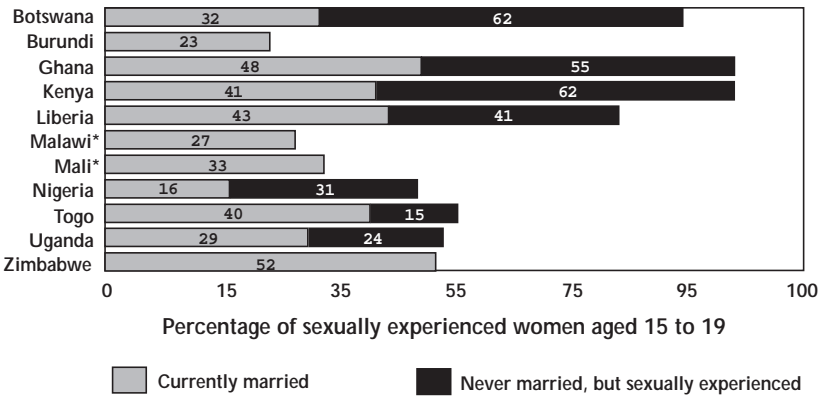
Figure 4:4 Current use of modern methods of family planning among female adolescents, by marital status



*Data on never married women not available.

Sources: Balepa et al. [1992]; Barrere et al. [1994]; Gaisie et al. [1993]; Katjiuanjo et al. [1994]; Kourgueni et al. [1993]; Malawi National Statistical Office [1994]; Ngailaba et al. [1993]; Population Reference Bureau [1992]; Republic of the Sudan Department of Statistics [1991]

Figure 4:5 Unmet need for family planning among female adolescents, by marital status



*Data not available for never-married women.

Sources: Malawi National Statistical Office [1994]; Population Reference Bureau [1992]

FEMALE EDUCATION AND ADOLESCENT FERTILITY

The relationship between *female education* and *fertility* is often believed to be a simple one: increases in educational attainment are accompanied by decreases in fertility. However, this relationship is actually more complex. Education may change reproductive behavior and affect fertility in a number of ways: by increasing knowledge of reproduction and contraception, by delaying entry into marriage or other unions, or by changing attitudes about contraception and child-bearing.²³ In turn, an early unplanned pregnancy may cause a woman to leave school, lowering her educational achievement. In addition, a woman enrolled in school is likely to be separated from the community that traditionally educated her about sexuality and discouraged her from behaviors that could result in an early pregnancy.

In fact, women enrolled in school *are* at greater risk of experiencing an out-of-union birth, because they are less likely to be married than their peers who are not in school. Among unmarried girls, those who expect to go to secondary school may delay sexual activity longer than their peers who do not expect to continue school. Women with a secondary education are less likely to give birth before age 20 than women with no education. Women with no formal education are more likely to marry early and are thus at less risk of premarital pregnancy.⁷

FEMALE SCHOOL ENROLLMENT RATES

Even after two decades of substantial improvement in school enrollment rates of girls, Africa lags behind other regions. In some countries, including Madagascar, Tanzania, Kenya, Zambia, Lesotho, Zimbabwe, Cameroon, Botswana, and Mauritania, nearly as many girls are enrolled as are boys. In other countries, such as Benin and Chad, only a third or fewer of primary school students are girls.

At the secondary school and university levels, many more males attend than females. Females account for more than 40% of secondary enrollment in only eight countries (Botswana, Congo, Gabon, Kenya, Lesotho, Madagascar, Swaziland, and Zimbabwe). In several countries,

including Burkina Faso, Burundi, Chad, Ghana, Malawi, Mali, Niger, Rwanda, Tanzania, and Uganda, less than 10% of female adolescents are enrolled in secondary school.⁷

CONTRACEPTIVE KNOWLEDGE AND USE

The level of *contraceptive knowledge* may vary according to a woman's marital status. If ever-married women are more likely to be sexually active than their never-married peers, they may be more knowledgeable about contraception. On the other hand, never-married women are likely to have received more formal education, including sex education.²³

Contraceptive use increases with education. Among women aged 15 to 24 in Kenya, 4% of those with no education have ever used modern contraception. This proportion rises to 10% among women with primary education and 19% among women with secondary education. Contraceptive use by women aged 15 to 24 with a secondary education ranges from 11% in Burundi and Senegal to 54% in Botswana.⁷

PATTERNS OF ADOLESCENT FERTILITY CHANGE

Trends in adolescent fertility over the last 20 to 30 years fall into three distinct patterns.⁷

PATTERN I

In countries such as Botswana and Kenya, adolescent birth rates are not increasing and may even be decreasing, but the proportion of births occurring outside marriage and to girls still enrolled in school is growing. Rates of female secondary school enrollment are high (between 31% and 36% of women aged 20 to 24 have attended secondary school), and marriage is often delayed. Premarital pregnancies and births are increasingly seen as mistimed events with negative consequences.

PATTERN II

Countries such as Liberia, Uganda, and Zimbabwe seem to be following a path similar to that taken by the first group, but at a slower pace. Increases have occurred in female school enrollment (but still fewer than 12% of women aged 20 to 24 have attended secondary school), age at marriage, and premarital childbearing.

PATTERN III

In countries such as Burundi, Ghana, Nigeria, Senegal, Mali, and Togo, very little change has occurred in adolescent childbearing, female education, or early marriage. Almost all women marry before age 20 in Mali, and fewer than 1% of adolescents are enrolled in secondary school. In Togo, levels of early marriage and childbearing have remained unchanged despite increases in secondary enrollment rates from less than 1% in the 1960s to 18% in the 1980s.

CONSEQUENCES OF EARLY SEXUAL ACTIVITY

In Africa, as elsewhere, the consequences of early childbearing are determined in large part by the surrounding social context. The impact of early childbearing may vary greatly according to a woman's level of education, the social reaction to adolescent fertility, and society's expectations.

FEMALE GENITAL MUTILATION

Genital mutilation, also known as female circumcision, is practiced in a number of African cultures as a rite of passage to womanhood. The practice contributes to early marriage and fertility. The combination of female circumcision and early birth is highly traumatic and potentially fatal for many African adolescents. Female genital mutilation is widely practiced in Cameroon, Mauritania, Chad, the Central African Republic, Sudan, Egypt, Niger, Mali, Burkina Faso, Kenya, and Tanzania. The most extreme form, infibulation, involving

removal of the entire clitoris as well as the labiae minora and majora, is practiced in Mali, Sudan, Somalia, parts of Ethiopia, and northern Nigeria. The procedure itself can lead to hemorrhaging, shock, acute infection, and death. It can also complicate childbirth, prolonging labor and leading to the birth of stillborn or brain-damaged children.

SOCIAL CONSEQUENCES

Regardless of their motives for sexual activity, most schoolgirls who become pregnant suffer common consequences, and it is among schoolgirls that these consequences are likely to be most devastating. Beyond the hazards of an illegal and unsafe abortion, their futures may be drastically changed by a birth that forces them to leave school. In fact, leaving school is one of the most serious consequences of early pregnancy, for both individuals and society. In 1986, an estimated 11,000 girls in Kenya dropped out of school because of pregnancy. In 1982, 18,766 Tanzanian girls were expelled because they were pregnant. Every year, 10% of the women enrolled in secondary school in Botswana, Kenya, and Mali are reported to drop out because of pregnancy.^{7,11}

In the past, adolescent women who became pregnant were married and unschooled; society had invested few resources in them. Increased education and rising expectations for young women have transformed the social and economic environment. The education of women represents an investment of scarce social and personal resources. Leaving school because of pregnancy results both in an individual loss of opportunity and in a squandering of scarce social resources.^{8,11}

SEXUALLY TRANSMITTED INFECTIONS

Aside from pregnancy, the greatest risk of sexual activity is becoming infected with a sexually transmitted infection (STI). Women are biologically more at risk of acquiring an STI from a man than a man is from a woman. (See Chapter 6 on Sexually Transmitted Infections.) The negative consequences of STIs can include infertility. Human

immunodeficiency virus (HIV) poses an especially dangerous threat; the risk of acquiring HIV is increased when women have other STIs.

Many of the negative consequences of STIs—pelvic inflammatory disease (PID), infertility, ectopic pregnancy, and cervical cancer—do not appear until later in life. The inability to have children may leave a woman ostracized in many African societies.²⁶

Both the detection and reporting of STIs are poor in sub-Saharan Africa. Infection rates appear to be quite high. Young women are more likely to become infected with HIV and other STIs than are young men or older women.⁷ A study at Kenyatta National Hospital in Nairobi found that 36% of pregnant women aged 15 to 24, but only 16% of older pregnant women, had an STI. The study found that adolescents, who comprised one-third of the syphilis cases, were twice as likely to be infected with the disease than older women. Another Kenyan study found that one-third of rural women aged 13 to 15 had laboratory evidence of gonorrheal infection.²⁶

Cultural practices and adolescent behavior may worsen both the spread and the sequelae of STIs among adolescents. Older, adult men who have sexual intercourse with much younger women expose their partners to their entire sexual histories. Young women in polygamous unions also face an increased risk of infection.⁷ In addition, older urban men increasingly seek out young women, who are believed to be "clean" or virgins to avoid infection with HIV.^{3,26} Adolescents may not recognize the symptoms of STIs, or they may be reluctant to seek treatment.

PREGNANCY AND DELIVERY

Pregnancy and delivery pose major health hazards for adolescents. Maternal mortality is highest among women who are very young or very old. Women less than 20 years old suffer more pregnancy and delivery complications, such as toxemia, anemia, premature delivery, prolonged labor, and cervical trauma, and are at higher risk of delivering low-birthweight babies. The infants of adolescent mothers suffer higher rates of infant and child mortality.¹⁸ Worldwide, preg-

nancy-related complications are the leading cause of death among women 15 to 19 years old.¹⁰

Contributing factors, other than biological age, that put young women at greater risk include the environment in which their pregnancies occur. African women of all ages bear the highest risk in the world of pregnancy-related illness and death because of their poor living conditions, inadequate nutrition, and insufficient health services.²⁶ These conditions and their consequences may be worse among young mothers. Adolescents with unintended pregnancies are particularly likely to have poor nutrition, fail to get prenatal care, and attempt to hide their pregnancies.¹⁸

The health concerns of early fertility are not affected by a woman's marital status.¹¹ However, unmarried women are at greater risk for the consequences of unintended pregnancy than are their married peers. Married women find it easier to obtain modern methods of contraception and feel less compelled to obtain an unsafe abortion to conceal a pregnancy.

Eclampsia

Pregnancy-induced high blood pressure is the primary pregnancy complication among adolescents. High blood pressure can lead to preeclampsia (toxemia), which in turn can lead to eclampsia. Untreated, eclampsia can cause congestive heart failure, paralysis, kidney failure, blindness, chronic hypertension, or death. A study in Nigeria found that 40% of women presenting with eclampsia were age 15 or less.^{23,26}

Anemia

Adolescents may also be at a higher risk of developing anemia and hemorrhage, conditions made worse by malnutrition. One study in Nigeria found that 60% of adolescent women, but only 15% of women aged 24 to 30, had anemia. Pregnancy, which depletes a woman's nutrient and iron reserves, may be especially harmful to very young adolescents, whose bodies are still developing.^{23,26}

Vesicovaginal fistula

A common consequence of early childbirth for both circumcised and uncircumcised women is vesicovaginal fistula (VVF), a tearing of the wall between the bladder and vagina that leads to constant leaking of urine. Two-thirds of the cases of VVF in northern Nigeria, where the condition is not rare, are reported to be the result of obstructed first labor.^{23,26} In Kenya, one study found that 45% of all cases of VVF were among adolescents.²⁶ Women suffering from VVF are ostracized from society and often turn to begging or prostitution to survive.^{10,26}

Obstructed or prolonged labor

Obstructed or prolonged labor is more likely to occur among adolescent mothers, especially very young adolescents.²³ Cephalo-pelvic disproportion (CPD), which occurs when the baby's head is too large to pass through the mother's pelvis, is a common complication during delivery. CPD occurs primarily in very young adolescents, whose physiological development is not complete. CPD is attributable not only to age but also malnutrition, which leads to an under-developed bone structure. CPD requires prompt cesarean delivery to save the life of the baby and possibly the mother. In the absence of surgical delivery, women may experience uterine rupture, vaginal tearing and fistulae, and severe lesions. The child may be crushed during delivery. CPD is a manageable condition, but adolescent women are less likely to receive the prenatal and delivery care that could reduce the problems associated with CPD. A study in Kenya found that 70% of the young women delivering at a local community hospital experienced difficult labor.²⁶

Abortion

Abortion probably poses the greatest direct threat to young women's health. In many African countries, abortion is illegal and dangerous. In fact, one-fifth of all maternal deaths in east and central Africa and as many as 54% in Ethiopia are due to complications of induced abortion.¹³

Evidence suggests that adolescent women are more likely to seek abortion than older women and, thus more commonly suffer from abortion-related morbidity and mortality.^{3,10,26} Adolescents also are more likely to seek abortion from non-medical providers, to seek abortions later in pregnancy, and to delay seeking treatment for complications.²⁶ (See Chapter 23 on Education and Counseling.) A study conducted at a major Nigerian hospital between 1985 and 1988 found that 72% of the women presenting for treatment of complications of illegal induced abortions were between the ages of 13 and 19—58% were primary or secondary school students, and 81% were unmarried.¹ Likewise, in Sierra Leone, women aged 15 to 24 comprised 81% of the women presenting at hospitals with abortion-related complications, and, in Zambia, women under 25 represented 59% of abortion-related hospital admissions. A study in Nairobi, Kenya, found that 67% of abortion-related deaths were to women aged 10 to 25.³ In Nigeria, illegal abortion is believed to be the leading cause of death among unmarried women aged 15 to 24, particularly those in school.²⁶

POLICIES AFFECTING ADOLESCENT REPRODUCTIVE HEALTH IN AFRICA

Adolescents are a low priority in both policies and programs at the national level in Africa. In many countries, pregnant students are often forced to leave school. In some countries, only married women can get contraceptives. Yet many other countries have started family life or sex education programs or raised the minimum legal age for marriage.

Current policies that affect adolescent reproductive behavior or its consequences are surveyed in Table 4:1, which provides an overview of five categories of policy: the provision of family life or sex education, policies regarding schoolgirl pregnancy, abortion laws, access to contraception, and minimum legal age of marriage. In many instances, information about these policies is not readily available. For example, there is very little information on school policies for preg-

nant students or access to contraception for adolescents. In addition, the table does not include any information on policies regarding female enrollment in secondary school, employment for teenagers, or efforts to improve the status of women, all of which affect adolescent reproductive behavior. Few nongovernmental organizations provide family planning services, vocational training, and formal schooling for adolescents who have children and were expelled from school. Some examples are the Tanzanian UMATI, Pathfinder International, the Maria Clementine Foundation, and the Botswana YWCA. More are needed.

FAMILY LIFE EDUCATION

Family life education (FLE) has been widely implemented throughout Africa. FLE curricula combine sex education with information on family roles and family life. In a sense, FLE is an attempt to institutionalize the kind of education that was previously provided by tribal elders. Twenty-three African countries offer FLE in primary schools, and 27 provide FLE at the secondary level.

However, there are several barriers to FLE's success:

- In countries where school enrollment rates are low, FLE has very limited influence on adolescent behavior.
- Adolescents may be exposed to the risk of pregnancy before they receive any FLE. Some countries do not offer FLE until secondary school. FLE has also been criticized for not reaching older youths. Several countries have instituted FLE in teacher's training colleges or at the university level.
- The content and quality of FLE curricula vary widely. Some schools focus on population education and exclude sex education and family planning education. In addition, teachers may be unqualified or unable to teach FLE successfully. They may lack training, materials, or time.^{3,7,17}
- There have been few, if any, evaluations of the impact of FLE on adolescent sexual behavior in sub-Saharan Africa. In the United States, studies have found that sex education pro-

grams have little impact on adolescents' behavior. The same may be true in Africa. In fact, African adolescents' knowledge of reproduction remains low across all education levels. In focus groups in Kenya and Nigeria, many youths complained that the information they received in school regarding reproduction was often incomplete and did not describe how to prevent pregnancy or STI transmission.⁵

SCHOOL POLICY

There is little information on school policies regarding pregnancy in most African countries, but in general, schoolgirl pregnancy is not tolerated. Expulsion or requiring a pregnant student to leave school for a while are common responses. In Botswana and Kenya, for example, young women may be allowed to return to school a year later. In Liberia, they are permitted to transfer to night school. School administrators and teachers contend that these young women are "bad influences." In some countries, nongovernmental organizations are allowed to provide formal education to girls who were expelled because of pregnancy.

ABORTION

Access to abortion is almost universally restricted across Africa. A few countries prohibit all abortions; 12 countries permit abortions only to save the life of the pregnant woman. Several countries permit abortions when the pregnant woman's physical or mental health is endangered. However, even in countries where abortion is legal, the requirements may be so great as to make abortions very hard to get. In many countries, the number of illegal abortions is far greater than the number of legal procedures.¹³ Such is the case in Zambia, for example, which has one of the most liberal abortion laws in Africa. Abortions may be performed only in a hospital setting, and a woman must obtain the signatures of three physicians before her abortion is authorized.¹³ These laws may pose barriers that are especially burdensome to adolescents.

CONTRACEPTIVE ACCESS AND SERVICES

A few countries limit access to contraception for all women, and several restrict access for unmarried adolescents even further. The national government of Swaziland is exceptional in its explicit promotion of contraceptive availability for unmarried adolescents. Kenyan president Daniel Arap Moi, in contrast, has publicly stated his opposition to contraception for unmarried adolescents.⁴ Even in countries where formal bans do not limit adolescents' access, there is often strong resistance to providing contraceptives to unmarried teens.^{3,23} Requirements such as spousal consent or medical prescription for contraception also deter adolescent contraceptive use. For most of sub-Saharan Africa, the national family planning service policies developed since 1990 have officially sanctioned reproductive health services for unmarried adolescents. Some examples exist in Uganda, Tanzania, Botswana, and Togo.

Even where there are no formal policies against providing family planning to adolescents, the stigma attached to visiting a clinic serves as a formidable barrier to contraceptive use for many adolescents.^{3,5,7,8,23,26} As contraceptives become increasingly available in pharmacies and other local commercial outlets such as patent medicine shops, adolescents' access to family planning may increase.⁸

AGE AT MARRIAGE

Early marriage may provide women with security, improved nutrition, and social support; however, the biological and physiological factors of young maternal age remain a potential health hazard for both a woman and her offspring (see Chapter 1 on Benefits of Family Planning). Traditional norms prescribing early marriage have persisted despite legal efforts to change marriage patterns. Laws banning early marriage have often not been observed or enforced.⁷ In countries such as Ghana, Kenya, Nigeria, and Côte d'Ivoire, the legal marriage age varies according to major administrative divisions, religious groups, or ethnic groups, which suggests that governments have had little success in changing marriage customs.²³ In Côte d'Ivoire, 41% of urban women and 43% of rural women marry before the legal age of 18. In Senegal, where the legal age for marriage is 16, 16% of urban women and 36% of rural women are married before age 15.⁷

Table 4:1 Survey of policies related to adolescent fertility in sub-Saharan Africa

Country	Family life or sex education	Circumstances for which abortion is permitted	Access to contraception	Minimum legal age for a woman to marry
Benin	prim and sec FLE in workplace	save life of woman	?	?
Botswana	in progress	unrestricted	?	?
Burkina Faso	prim and sec	save life of woman	by Rx	—
Burundi	prim and sec	medical risk	—	—
Cameroon	in progress	health risk; rape or incest	—	16
Cape Verde	prim and sec	?	—	—
C.A.R.	prim and sec	save life of woman	—	—
Chad	prim and sec	save life of woman	—	—
Congo	prim and sec	broad medical	—	18
Côte d'Ivoire	prim and sec	save life of woman	restricted for all	18
Ethiopia	sec	narrow medical	—	12-15 ^a
Gabon	in progress	narrow medical	no Rx if under 25	15
Gambia	in progress	broad medical	married only	no min
Ghana	in progress	broad medical	—	none-21 ^a
Guinea	prim and sec	broad medical	—	17
Kenya	sec	certified health risk	proscribed for unmarried youth	9-18 ^a
Lesotho	in progress	health risk	—	16
Liberia	prim and sec, TC	save life of woman	—	16
Madagascar	prim and sec	severely restricted	by Rx for adults only	14
Malawi	in progress	save life of woman	—	—
Mali	prim and sec	prohibited	permitted for birth spacing	16-18 ^a
Mauritania	prim and sec	narrow medical	by Rx only	—
Mozambique	prim and sec, TC, univ	save life of woman	permitted for birth spacing	—
Niger	prim and sec	narrow medical	—	16

Table 4:1 Survey of policies related to adolescent fertility in sub-Saharan Africa (Continued)

Country	Family life or sex education	Circumstances for which abortion is permitted	Access to contraception	Minimum legal age for a woman to marry
Nigeria	prim and sec, TC, univ	North: save life of woman South: physical or mental health	government supports access for all ages	9-16 ^a
Rwanda	prim and sec	save life of woman	—	21
Senegal	in progress	health risk	—	16
Seychelles	prim and sec	save life of woman, rape or incest, birth defects	—	—
Sierra Leone	prim and sec, TC	save life of woman	illegal under 18	15
Somalia	prim and sec, TC	health risk	—	18
South Africa	—	health risk, with authorization	—	21
Sudan	—	save life of woman	—	—
Swaziland	—	physical or mental health	permitted to unmarried adolescent	16
Tanzania	prim and sec, TC	save life of woman	married women	16
Togo	prim and sec	save life of woman or health risk	—	17
Uganda	sec and TC	physical or mental health	—	18
Zaire	prim and sec	prohibited	—	—
Zambia	sec and TC FLE in factories	medical and social grounds	spousal consent required	21
Zimbabwe	in progress	save life of woman, rape or incest, birth defects	—	18

— Information not available.

prim: primary schools

sec: secondary schools

TC: teachers training colleges

univ: universities

^aVaries according to major administrative divisions, religious groups, or ethnic groups.

Sources: Bledsoe and Cohen (1993); United Nations (1989a), United Nations (1989b), United Nations (1990)

STRATEGIES FOR REDUCING ADOLESCENT FERTILITY

Each provider plays a key role in helping adolescent clients make the complex decisions about whether to be sexually active, how to protect themselves if they are sexually active, what to do if pregnancy or an STI occurs, and where to seek support to pursue an education while learning to care for a baby. Each provider and clinic should create a positive atmosphere that lets young clients know they are welcome and will be treated with respect. An adolescent's decisions, health, and future can be significantly influenced by effective client-provider interaction.

Nations that seek to reduce sexual activity and fertility among adolescents will find the task puzzling and challenging. It is difficult to find successful models from other nations or cultures that have mounted strategies to reduce the pregnancy and childbearing rates of very young women. Many Western nations, such as the United States, have achieved little success in changing the reproductive patterns of these adolescents. Moreover, having thousands of cultures within Africa makes it impossible to suggest general strategies for the entire continent. In many African nations, adolescent childbearing is desirable in the context of marriage but undesirable outside of marriage. However, a pregnancy that occurs during the mother's adolescence poses medical hazards, whether the woman is married or not. STIs threaten the fertility and health of the married as well as the single woman. These risks can be reduced to some extent simply by providing adequate family planning and medical services to young women to help them delay childbearing and to protect against STIs.

Success in reaching acceptable levels of adolescent pregnancy, childbearing, and STIs will most likely come when strategies are developed and implemented at local levels. In addressing these issues, the health care providers must try to deliver positive messages and involve adolescents' peers and traditional birth attendants. However, medical interventions alone cannot solve most public health problems. One useful guide to follow when considering potential strategies for intervention is to focus on three major influences on health: (1) the medical system; (2) the personal behaviors of the adolescents themselves;

and (3) the political, social, and economic community environment. Listed in Table 4:2 are several strategies that have been used to reduce adolescent fertility: providing medical services, encouraging personal behavior change, and creating a community environment that meets adolescents' needs.

Table 4:2 Strategies for reducing adolescent fertility

Medical Services	Personal Behavior	Community
• Provide a broad variety of contraceptive methods	• Educate adolescents about making a life plan—deciding when pregnancy would fit into their lives	• Educate youth about family planning—through schools, churches, community leaders, and media
• Accept adolescent clients	• Encourage both young men and women to say "no" to sexual relations	• Rally commitment among community leaders to provide services to adolescents
• Train medical staff how to serve adolescent clients	• Encourage men to use condoms	• Gain acceptance of the concept of confidentiality
• Remove barriers to providing contraceptives (see WHO guidelines)	• Instill a commitment to avoid pregnancy and HIV infection	• Acknowledge the sexuality of adolescents
• Dispense a 1-year supply of contraceptives to each client	• Expect men to accept the consequences of their actions with women	• Take constructive rather than punitive measures
• Honor the adolescent's desire for confidentiality	• Discourage older men from having intercourse with virgins in order to avoid infection	• Educate workers in drug dispensaries to maintain confidentiality and be sensitive to adolescents' needs
• Make clinic hours and locations convenient for adolescent clients	• Provide prostitutes and their clients condoms and education on how to use condoms	• Improve the education of women
• Increase staff sensitivity to the embarrassment and consequences that sexually active adolescents face	• (fill in) _____ _____ _____	• Increase women's status in the society
• Include family planning discussions in all medical encounters		• Raise the legal age for marriage
• Acknowledge that many adolescents are sexually active and need protection from pregnancy and sexually transmitted infection		• (fill in) _____ _____ _____
• (fill in) _____ _____ _____		

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HIV, AIDS, and Reproductive Health

Theresa was 17 years old when she married. She had a baby right away, and another one 3 years later. The second one was sickly and died before his first birthday. Soon after, her husband became ill with tuberculosis. He went to the doctor for medicines, which he took for 6 months. After he had been well for nearly a year, he began having diarrhea and weight loss. Theresa again became pregnant, but her husband died before the baby was born.

*When she found out that her husband had died of AIDS, she asked the doctor many questions about the illness and how it was spread. It surprised her that people could have a silent virus that could make them sick after many years. She realized her husband may have become infected before they were married. She had never had sex except with her husband, nor had she ever received a blood transfusion, so she knew that she could not have given the infection to her husband. She wondered if he gave **her** the virus, and if that was why their second baby died.*

Theresa and her child went back to her village to live with her mother. She was afraid for the baby she was carrying, but he was born healthy and grew strong.

Acquired immune deficiency syndrome (AIDS) is a fatal disease that has no cure and no vaccine to prevent it. The disease is caused by the human immunodeficiency virus (HIV), a retrovirus transmitted from an infected person through unprotected sexual intercourse (vaginal, oral, or anal), by exchange of body fluids such as blood, or from a mother to her infant during pregnancy, childbirth, or breastfeeding.

Some people mistakenly think that HIV can be transmitted through insect bites, dirty water, handshakes, coughing, sneezing, shared food, bad air, or witchcraft. It cannot be transmitted in these ways. Some people mistakenly believe that HIV can be cured or that a vaccine exists to prevent it.^{1,5,34,44,52,59} Still others mistakenly believe that they can tell who is infected with HIV simply by looking at them or wrongly think that young people cannot be infected.

Most people who are HIV-infected do not feel sick and do not know they are infected until years later, when the symptoms of AIDS finally appear. Because people with AIDS usually lose weight, it is sometimes called the "slim disease" or "body shrinker."⁶ Two types of HIV can cause AIDS, HIV-1 and HIV-2. HIV-1 is far more common.

GLOBAL HISTORY OF HIV-1

AIDS was first described in the early 1980s, and HIV was identified as the cause a few years later. The infection has become a worldwide epidemic. In some areas, men who have sex with men have the highest rate of infection. In other communities, people who share bloody injection equipment (needles or syringes) have the highest HIV prevalence. In still other areas, heterosexual transmission is the most common route of infection.

In most places, HIV is spread by *more than one* transmission route. For example, a man who became infected by re-using contaminated injection syringes may pass the infection to his wife by having sex with her. If his wife is pregnant or becomes pregnant later, she may then pass the infection to her baby. The routes of transmission are the same around the world, but differing patterns of human behavior allow the virus to travel faster in certain social networks. People who

frequently have unprotected sex (sex without a condom) or share injection equipment are most likely to become infected. They can then expose others to their virus. In general, the more sexual partners a person has had, the higher that person's risk of becoming infected with HIV and of infecting others. However, it does not take multiple partners to become infected; a person with just one HIV-infected partner is at extremely high risk.

TRANSMISSION TRENDS OF HIV-1 IN AFRICAN NATIONS

Africa is the continent most severely affected by HIV infection. In sub-Saharan Africa in 1997, an estimated 4.0 million people were newly infected with HIV, 530,000 of whom were children. This amounts to 11,000 new infections per day. As of late 1997, an estimated 20.8 million people were living with HIV in sub-Saharan Africa.⁶ It is not possible to test entire populations for HIV, so the exact numbers of HIV-infected people are not known. The general prevalence of HIV infections is extrapolated from studies of specific groups who can be routinely tested for HIV (such as military personnel, pregnant women, or people with sexually transmitted infections [STIs]). See Figures 5:1 and 5:2.

In addition, most of the available statistics describe the final stage, AIDS, and not HIV infection. Therefore, when reading about AIDS cases, keep in mind that these statistics do not include most people infected with HIV, who are not yet sick. AIDS statistics also can be misleadingly low because of the difficulties with diagnosis and delayed reporting.

In African countries, heterosexual contact accounts for more than 80% of HIV transmission.⁴⁶ In some areas, men and women are infected at equal rates. In other areas, women are more likely to be infected.⁵³ Women are often infected at younger ages than men. HIV prevalence is highest in women aged 15 to 25 years; it peaks in men 5 to 10 years later. The number of reported AIDS cases among women aged 15 to 19 is twice that of men of the same age.^{4,53}

Figure 5:1 HIV-1 prevalence in high-risk populations, which include commercial sex workers, their clients, and sexually transmitted disease patients

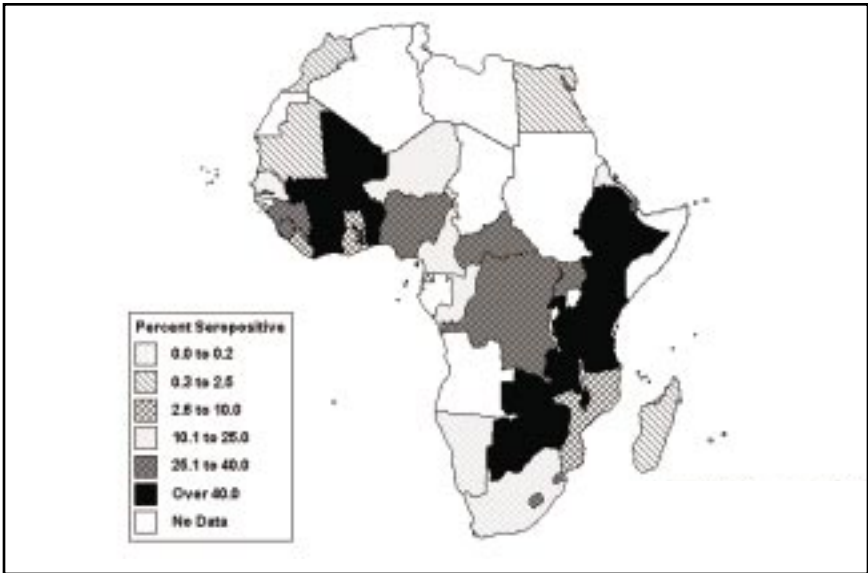
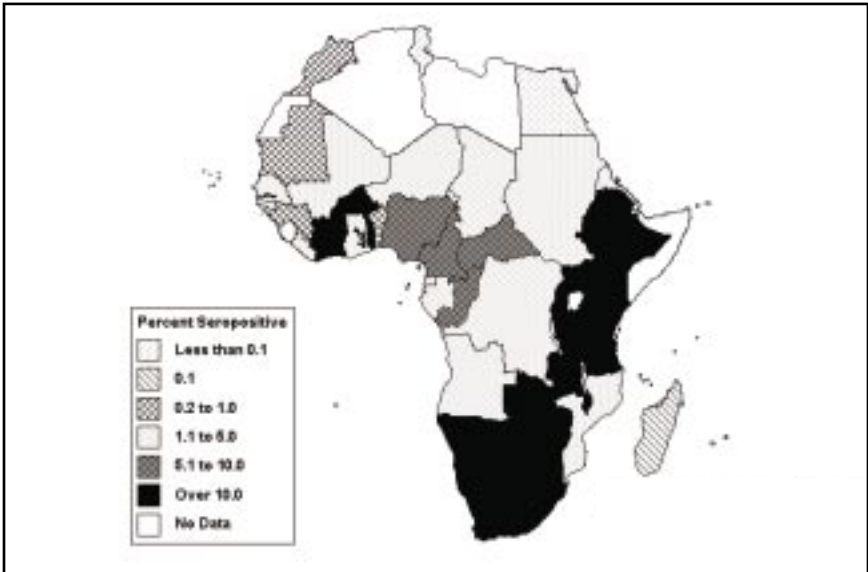


Figure 5:2 HIV-1 prevalence in low-risk groups, which include pregnant women and the general population



Source for Figures 5:1 and 5:2: U.S. Bureau of the Census, Population Division, International Programs Center, HIV/AIDS Surveillance Database, January 1998.

The next most common route of HIV infection in Africa is from an infected mother to her newborn. This vertical transmission can occur either during pregnancy, delivery, or breastfeeding and is associated with more advanced disease in the mother, severe prematurity, and other factors.

The most efficient route of HIV transmission is through blood transfusion from infected donors. From 4% to 10% of HIV cases are transmitted this way.^{36,62} This route affects primarily women and children, because transfusions are most often given to infants with malaria or sickle cell anemia and women with obstetrical complications. In Africa, injection drug use and other means of HIV transmission account for less than 1% of HIV cases.³⁶

Between the early 1980s and the 1990s, HIV seroprevalence rates increased dramatically in many groups:

- Men attending STI clinics in Nairobi, Kenya: 3% were HIV-infected in 1981; 23% were in 1990.
- Adults in Abidjan, Cote d'Ivoire: about 1% were HIV-infected in 1987; more than 7% were in 1991.
- Pregnant women in Nairobi, Kenya: 2% were HIV-infected in 1985; 13% were in 1991.
- Blood donors in Nigeria: none were HIV-infected in 1987; 1.5% were in 1990.^{36,46}
- Pregnant women in Free State, South Africa: 4.3% were HIV-infected in 1993; 11% were in 1995.
- Pregnant women in Kwazulu/Natal, South Africa: 9.6% were HIV-infected in 1993; 18% were in 1995.³

Although some countries have been able to slow the incidence of new infections with aggressive prevention programs, infection rates are still increasing in many regions.

Other groups, such as commercial sex workers, men who have sex with commercial sex workers, military personnel, truck drivers, and people with other STIs have higher than average rates of HIV infection, above 85% in certain instances.⁴⁶ These individuals are also more likely to be infected with HIV and other STIs and are often referred to as high-frequency transmitters or "core groups."

In general, the rural epidemic is several years behind the urban epidemic. HIV is expanding into rural areas, however, and rural rates are climbing.

PREVALENCE OF HIV-2

HIV-2, a retrovirus similar to HIV-1, causes a similar illness, but the symptoms progress more slowly. HIV-2 is transmitted by the same routes as HIV-1, but it is less easily transmitted by the perinatal route. Mothers infected with HIV-2 pass the infection to their infants in up to 8% of births. Some authorities believe HIV-2 is also less easily transmitted by the sexual route.²⁹ Among individuals with HIV-2, however, 40% of their sexual partners also had the infection.⁴⁶ HIV-2 can be transmitted by blood transfusions. A Cote d'Ivoire study showed that 7.4% of blood donors were infected with HIV-2 in 1986-1987. The same study showed that 15% of children who had received multiple blood transfusions had HIV-2, and that none of the children who had never been transfused had HIV-2. The children who had received blood transfusions were also much more likely to have HIV-1, which was slightly less prevalent than HIV-2 in donors tested at that time.⁴⁸ See Figures 5:3 and 5:4.

PROGRESSION OF HIV INFECTION TO AIDS

After becoming infected with HIV, most people will not immediately notice any illness. After a few weeks, some infected people become ill with fever, sore throat, enlarged lymph nodes, rash, and general fatigue or malaise. This is called the acute retroviral illness, or *primary HIV infection*, and the symptoms disappear within a few weeks. By the time the newly infected persons would test positive for HIV, about 6 weeks to 6 months after becoming infected, they feel healthy again. (See Table 5:1 on the Spectrum of HIV infection.)

Figure 5:3 HIV-2 prevalence by country for high-risk urban populations: commercial sex workers, their clients, and sexually transmitted disease patients

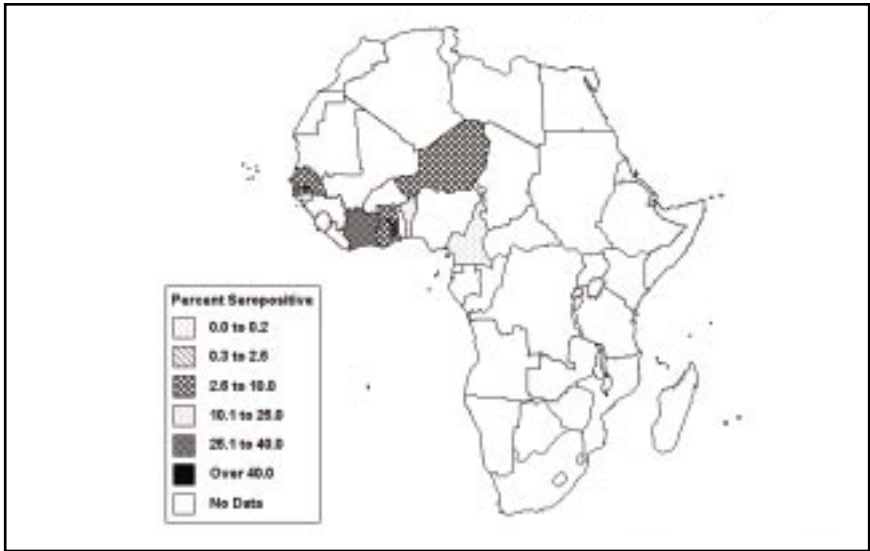
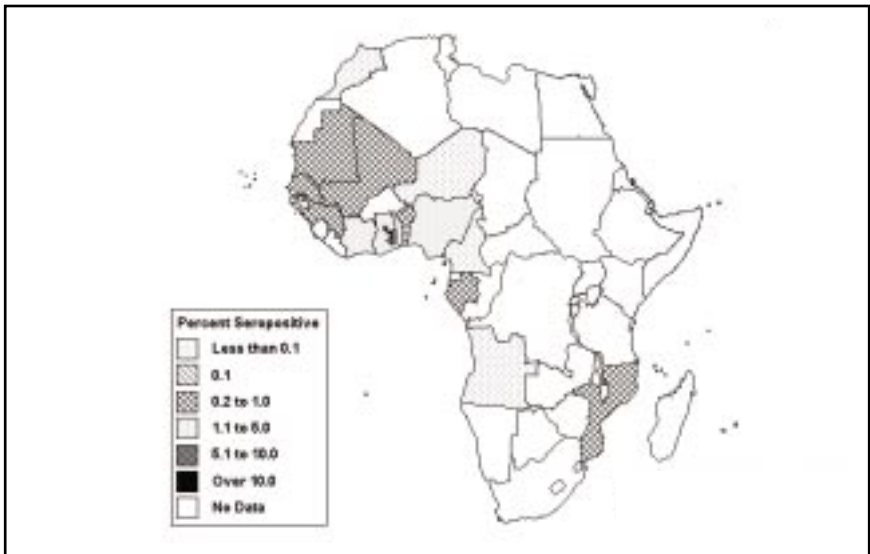


Figure 5:4 HIV-2 prevalence by country for low-risk urban populations: pregnant women and the general population



Source for Figures 5:3 and 5:4: U.S. Bureau of the Census, Population Division, International Programs Center, HIV/AIDS Surveillance Database, January 1998.

Table 5:1 Spectrum of HIV infection

	Primary Infection	Asymptomatic Period	AIDS	Endstage
Symptoms	Acute retroviral illness: sore throat, fever, swollen nodes, rash, resolves spontaneously	No disabling symptoms; swollen lymph nodes, increased skin rashes, herpes zoster, pulmonary TB, dry skin, diarrhea	Disseminated or pulmonary TB, prolonged diarrhea, fevers, weight loss, bacterial pneumonias, invasive cancers, debilitating fatigue late in stage	Severe weight loss, chronic fever, simultaneous and recurrent infections, unable to care for self
Duration	2-4 weeks	<1 to >10 years	Usually <1 year	Weeks to months
HIV antibody test	Negative	Positive	Positive	Positive

Note: Not all symptoms are experienced by everyone with HIV or AIDS.

The duration of apparent wellness that follows can last for years. This is called the *asymptomatic period*, and it may extend from less than 6 months to more than 10 years. The infected person looks and feels fine and is able to work or care for the family without impairment. However, the immune system gradually loses its ability to fight infections.

People who discover their infection during this phase sometimes have trouble believing they are actually infected. The health care worker may suggest that the infected person bring his or her sex partner for counseling and assessment. HIV-infected people may be fearful that others will find out about their HIV status and stigmatize, blame, or avoid them. They may fear being abandoned by their spouses. Married couples may need help in dealing with the fear and mistrust that may ensue. Peer support groups for HIV-infected people, available in some areas, may provide a safe place for discussion of how to handle these challenges.

Before developing the symptoms of full-blown AIDS, the infected person may begin to notice some unusual symptoms such as candidiasis (a fungal infection) in the mouth or vagina, worsening of skin rashes, and fatigue. Once referred to as AIDS-related complex (ARC), this set of symptoms is now considered part of the *early symptomatic period*.

Once HIV has weakened the immune system, bacterial infections become more severe, last longer, and are harder to treat with antibiotics. Tuberculosis, bronchitis, and pneumonia are more common and severe in patients with AIDS. Fungal and protozoal infections often will not go away, even with treatment, and may cause death in a short time. Viral infections can become chronic, with persistent or worsening symptoms. These infections are called *opportunistic* infections, because they take advantage of the opportunity of an impaired immune system to cause major, life-threatening illnesses. When opportunistic infections or certain rapidly growing cancers occur, the illness is classified as *AIDS*. Cryptococcal meningitis, esophageal candidiasis, cerebral toxoplasmosis, and invasive Kaposi's sarcoma are examples of such diseases. Other symptoms during this phase include severe weight loss, anemia, prolonged diarrhea, extreme fatigue, dry skin, rashes, and thin or wispy hair. HIV can directly interfere with normal functioning of the brain, the gastrointestinal tract, and other body systems (see Table 5:2).

Survival after progression to AIDS is usually short. In African nations, death usually occurs within 6 months after AIDS is diagnosed,⁶⁴ but individual survival varies widely. Even in areas with extensive diagnostic and medical resources, a person with AIDS may live only a few years. Death is generally a result of opportunistic infections, severe weight loss, or any of the cancers commonly seen with AIDS.

Aggressive treatment for HIV infection, available in settings with extensive medical resources, involves the use of 2 or more antiretroviral drugs to reduce the actual number of HIV (viral load) in the body. These drugs must be taken several times a day for life, because they only help while they are in the patients' body. The person can still infect others, but the decrease in viral load helps preserve the immune

system. Because of the expense of such treatment, it has been unavailable to most people with HIV in 1998. Medical treatment also seeks early diagnosis and rapid treatment of opportunistic infections. The type of opportunistic disease seen in AIDS varies from region to region, depending on what bacteria, fungi, viruses, and parasites are common to the area (air, water, and people). In some locations, a particular opportunistic infection may be so common and so lethal that HIV-infected persons are given a specific drug to prevent such an infection, rather than wait for the infection to occur and then treat it. For example, in a group of Abidjan patients who were treated for tuberculosis, daily co-trimoxazole (trimethoprim 160 mg. and 800 mg. sulfameth-oxazole) prolonged survival and greatly reduced hospitalizations due to enteritis and bacterial infections.⁶⁷ Whether this will hold true for people without TB or people in other regions remains to be seen. With aggressive treatment, a patient's life may be extended a year or more.

Table 5:2 WHO case definition for AIDS surveillance in adults and adolescents

For the purposes of AIDS surveillance, an adult or adolescent (>12 years of age) is considered to have AIDS if at least two or more of the following major signs are present in combination with at least one of the minor signs listed below and if these signs are not known to be due to a condition unrelated to HIV infection.

Major signs

- Weight loss greater than or equal to 10% of body weight
- Chronic diarrhea for more than 1 month
- Prolonged fever for more than 1 month (intermittent or constant)

Minor signs

- Persistent cough for more than 1 month*
- Generalized pruritic dermatitis
- History of herpes zoster
- Oropharyngeal candidiasis
- Chronic progressive or disseminated herpes simplex infection
- Generalized lymphadenopathy

The presence of either generalized Kaposi's sarcoma or cryptococcal meningitis is sufficient for the diagnosis of AIDS for surveillance purposes.

*For patients with tuberculosis, persistent cough for more than 1 month should not be considered a minor sign.

From: World Health Organization (1994)

HIV TRANSMISSION AND CONTRACEPTION

Several contraceptive methods reduce the risk of HIV and other STIs, although a few may actually increase risk of these infections (see Table 5:3). No matter what other methods of contraception a person is using, if he or she is at any risk because a sex partner is HIV-infected or because the partner's HIV status is not known, advise him or her to use condoms with every sexual act. No other contraceptive method besides abstinence provides this degree of protection.

Studies of contraceptive use and HIV transmission are particularly complex because both the choice of contraceptive method and the risk of HIV transmission are related to sexual behaviors. For example, women who use hormonal contraceptives may engage in sexual behaviors that place them at increased risk of HIV—such as reduced use of condoms. Further studies are needed to clarify the true risk associated with the hormonal methods themselves. *Until then, women using oral, implantable or injectable contraceptives should be advised to use condoms with every sexual act if their partners' HIV status is unknown.*

CONDOMS

Because a woman's HIV status does not seem to affect fertility, it is important to provide contraceptive counseling and contraception to women with HIV. Women known to have HIV infection should be counseled that they can infect their partners, and that among contraceptive methods, only condoms can reliably reduce HIV risk to uninfected partners. Again, this requires that condoms be used in addition to other types of contraception, and that they be used consistently and correctly for every sexual act.

Condom use reduces the risk of HIV and other STIs effectively, but condoms work only if used correctly all the time.¹⁶ In several studies of heterosexual couples, consistent and correct use of condoms reduced by 90% to 100% the risk of HIV transmission from the infected man to the uninfected woman.¹⁶ Consistent condom use is also highly effective in preventing HIV transmission from an infected woman to an uninfected man.²⁷

Table 5:3 Contraceptive effects on sexual transmission of HIV

Method used	HIV Transmission Risk		Comments
	Male-to-female	Female-to-male	
Hormonal:			
Pills	Conflicting data: several studies seem to show higher risk with pill use; many show no increase	No clinical studies; increased HIV shedding on hormonal contraception in one study	May vary depending on composition of pill and other factors
Injections	Studies in monkeys showed increased risk with progesterone; most studies in humans show no increase in risk	No clinical data	
Implants	No data	No data	
Condoms: male or female, latex or synthetic	Offers excellent protection from virus when correctly and consistently used	Offers excellent protection from virus when correctly and consistently used	May be used in combination with other contraceptive to reduce HIV risk
Vaginal spermicides: sponges, foam, films, suppositories, and jellies (nonoxynol-9)	Conflicting data: daily sponge users had higher HIV risk; non-sponge spermicides have shown some protective effect against HIV in one study	No clinical studies; spermicides inactivate HIV upon contact	Frequent use of nonoxynol-9 may cause vaginal or vulvar irritation; some STI reduction with spermicide use
Intrauterine devices (IUDs)	Most studies show no increased susceptibility to HIV	No clinical observations, but some IUDs increase amount and duration of menses: sex during menses poses higher risk	Not considered safe for women at risk of STIs. HIV-infected IUD users must have continued access to medical care
Coitus interruptus (withdrawal before ejaculation)	Reduction in risk when practiced consistently with stable partner; Some transmission still occurs	Males are still exposed to female vaginal and cervical secretions, although duration of exposure may be shorter	
Surgical sterilization (vasectomy, tubal ligation, hysterectomy)	No clinical studies on HIV; unlikely to reduce risk	No clinical studies on HIV; unlikely to reduce risk	Semen and vaginal secretions still contain HIV; absence of cervix not protective
Diaphragm or cervical cap	No clinical studies on HIV	No clinical studies on HIV	Risk of other STIs is less, but HIV can invade through vaginal wall (unlike STIs requiring cervical exposure)

Although some studies have suggested that condoms are not very effective in preventing HIV transmission, those studies usually did not ask how frequently condoms were used. In those studies, people who used condoms rarely or occasionally may have been misclassified as condom users. (See Chapter 16 on Condoms.)

INTRAUTERINE DEVICES

Two cross-sectional studies, one in Italy and one in Tanzania, have shown that women with a history of intrauterine device (IUD) use are more likely to be HIV infected than those without a history of IUD use.³⁰ In a recent Italian study, women who used an IUD during a stable relationship with an HIV-infected male partner appeared to have only a slightly higher risk of HIV infection than women who did not.⁴³ However, women who had an IUD inserted or removed during the relationship had a significantly increased rate of HIV infection.⁴¹ The association may be related to inflammatory changes in the uterine mucosa that increase the number of HIV target cells available to become infected.⁴¹

In cross-sectional studies, IUD users were no more likely to be infected with HIV.¹⁹ More recently, a prospective study of women attending a family planning clinic in Tanzania showed that women using IUDs were not at increased risk for HIV seroconversion.³⁰ Thus, the risk for HIV infection associated with IUD is uncertain. IUDs have been associated with pelvic inflammatory disease (PID), but most IUD-associated PID is thought to be attributable to STIs. For this reason, IUDs are not generally recommended for women at risk for STIs, including HIV. Women known to be infected with HIV may safely use IUDs if they have continued access to medical care, and a stable, mutually monogamous relationship.⁶⁸

HORMONAL METHODS: ORAL CONTRACEPTIVES, IMPLANTS, AND INJECTABLES

Whether oral contraceptive (the "pill") use has any effect on HIV transmission is controversial. In Nairobi, women who had taken oral contraceptives were more likely to be HIV-infected than were those who had not.⁵¹ Commercial sex workers and women attending STI clinics also showed an increased risk for HIV if they used oral contraceptives.⁴⁷ In contrast, an Italian study suggested that women who had taken oral contraceptives were slightly less likely to be HIV-infected.⁴³ Other studies conducted among commercial sex workers or women in stable relationships have not found a significant increase in HIV risk among oral contraceptive users.^{16,30} In these studies, it is almost impossible to rule out the possibility that other factors accounted for the difference in HIV risk. Thus, it is difficult to tell whether an increased risk of HIV is attributable to oral contraceptive use or to other characteristics.

Of 10 published studies with data on Depo-Provera use, only one reported an increased risk of HIV among women using Depo-Provera.¹⁷

VAGINAL SPERMICIDES

The role of vaginal spermicides (sponges, foams, suppositories, films, and gels) in reducing the risk of HIV infection is controversial. Alone, they are not currently recommended for preventing HIV infection in women. Although spermicidal ingredients (nonoxynol-9, octoxynol, benzylkonium chloride, and menfegol) kill HIV under laboratory conditions, their usefulness in preventing HIV transmission during sex is less certain.^{23,27,32}

Nonoxynol-9 can be irritating. Four groups of women were given intravaginal doses of nonoxynol-9 on different schedules: every other day, daily, twice a day, or four times a day. The women who received the spermicide more often than every other day had vaginal irritation.⁴⁹ Women who used menfegol spermicidal foaming tablets more

than once per day had more genital lesions, even though they did not report problems.²³ Frequent use of higher doses of spermicides may cause genital irritation that could actually increase the woman's HIV risk. Whether vaginal spermicides affect HIV transmission from an infected woman to an uninfected man has not been fully investigated.

Although observational studies have suggested that prostitutes using nonoxynol-containing spermicides were less likely to have HIV infection, randomized trials have not shown that these spermicides protect against HIV. A Nairobi study found a higher rate of HIV conversion in commercial sex workers using the vaginal sponge, which contained high doses (1 gram) of nonoxynol-9, than in commercial sex workers using inert suppositories.³¹ The increased risk may have been due to chemical or mechanical irritation from daily, near-continuous sponge use, and may not hold true for women who use sponges infrequently, or women who use nonoxynol-9 creams or suppositories.

COITUS INTERRUPTUS

Stable couples in which the man was HIV-infected and the woman was not demonstrated that coitus interruptus (withdrawal of the penis before ejaculation) was somewhat better than unprotected intercourse with ejaculation at keeping the woman from becoming infected. This method cut the HIV sero-conversion rate of women by half in one study⁴¹ and by a larger percentage in another.¹⁶ These studies examined only stable, heterosexual couples. The findings may not hold true for women with several HIV-infected partners. Coitus interruptus has not been studied as a way to reduce HIV transmission from an infected woman to an uninfected man.

Coitus interruptus probably decreases a woman's HIV exposure by reducing the amount of semen that enters her vagina. However, the seminal fluid that emerges from the penis before ejaculation may contain some HIV.²⁷ Although coitus interruptus may be better than intercourse with ejaculation at preventing HIV transmission, a number of women have become infected while their partners reported consistently practicing withdrawal.

DIAPHRAGMS AND CERVICAL CAPS

No information is available regarding the usefulness of the diaphragm or cervical cap in preventing HIV transmission. Case reports have shown that vaginal contact with HIV-containing semen is enough to infect a woman. Any barrier that covers only the cervix or the cervix and part of the vaginal wall does not adequately protect the user from HIV transmission.²⁷

VOLUNTARY STERILIZATION

Voluntary sterilization (tubal ligation, hysterectomy, or vasectomy) has not been clinically studied to find out if it alters the rate of HIV transmission. Because all the elements for HIV transmission remain in place after such surgery, sterilization would not be expected to increase or decrease this risk.²⁷

FERTILITY AWARENESS

Fertility awareness methods have no known impact on HIV or STI transmission. They may have some use in risk reduction when an HIV-infected man and his uninfected wife want to have a child. Some couples in these circumstances do not wish to adopt a child or use semen from an uninfected donor to impregnate the woman. Fertility awareness methods can be used to time the unprotected sex act to the woman's days of maximum fertility, so the woman's exposures to HIV is minimized. (See Chapter 18 on Fertility Awareness.) There is no guarantee the woman will escape HIV infection or the risk of passing it on to their baby. Be sure the couple understands the need to use condoms for all other sexual intercourse. If a couple is determined to pursue this option, they should be fully informed of the risks to the mother's and the fetus' health. If the woman is fearful of risking infection or shows signs that she feels coerced, her wishes must be respected.

FACTORS FACILITATING SEXUAL HIV TRANSMISSION

The chance of getting HIV when having sex with an infected partner varies considerably for each person. Some individuals had sex with an infected person one time and contracted HIV. Other individuals had sex with an infected person many times and did not contract the infection, but many such persons did eventually contract HIV.

Certain factors increase the danger of getting HIV when having unprotected sex (sex without a condom) with an infected person:
19,30,40,41,43

- Gender (most studies suggest HIV is two to three times more easily transmitted from an infected man to a female partner than from an infected woman to a male partner)
- Anal intercourse (more risk to receptive partner)
- Advanced HIV disease
- Any STI, especially genital ulcers, in either the HIV-infected or uninfected partner
- Frequent intercourse (>2 times a week)
- Sex during menses (if the female is infected)
- Uncircumcised male partner (increases the risk for uninfected men of getting HIV)
- Use of vaginal drying agents

SEXUALLY TRANSMITTED INFECTIONS

Almost any STI increases the chance of HIV transmission, particularly those that cause genital sores or ulcers.⁶⁰ In a Malawi study of HIV-infected men, those without urethritis had about 17,000 HIV copies/ml of semen, but those with urethritis had about 125,000 HIV copies/ml.²⁶ Only two weeks after urethritis treatment, the viral count dropped to 37,000 HIV copies per ml. In women, a similar correlation was seen between a current STI and detectable numbers of HIV in cervical and vaginal secretions.²²

Rapid, effective treatment of STIs curbs the spread of HIV. A study in Tanzania found a dramatic reduction in new cases of HIV among men and women who received improved STI treatment services.²⁴ Sometimes infected partners may provide the only route for finding and treating women, because women often have no symptoms of their STI.⁶⁰ For example, in a group of rural Ugandan women, 65% had reproductive tract infections, but only 8% reported a vaginal discharge.⁴⁵ Women with untreated STIs are not only more likely to become HIV-infected and pass on their HIV infection to others, but they are also more likely to experience infertility, chronic pain, and perinatal complications, as well as neonatal blindness, disfigurement, and death. (See Chapter 6 on Sexually Transmitted Infections.)

BLEEDING, ABRASIONS, AND VAGINAL DRYING AGENTS

Any sexual or hygiene practice that causes friction, abrasion, or irritation may lead to small breaks or tears in the woman's genital mucosa. Thus, almost any intravaginal product such as douches, tampons, or substances to dry or tighten the vagina will increase the risk of HIV infection among women having sex with HIV-infected men.³⁷ "Dry sex" (removal of vaginal secretions before intercourse) and use of intravaginal herbs, leaves, or powders are likely to increase the transmission of HIV infection during sexual intercourse.²⁸ Any sexual practice associated with bleeding in either partner would also be likely to increase HIV transmission. Breaking the hymen, if traumatic or associated with bleeding, is thought to magnify the risk of HIV transmission from an infected man.¹⁰ Finally, if an HIV-infected woman has sex during her menstrual period, she is more likely to transmit the virus to her partner.⁴⁶

FEMALE GENITAL INFIBULATION

The effect of female genital infibulation (circumcision) on HIV transmission has not been studied. The woman's husband or partner is expected to separate (defibulate) this tissue during her first sexual intercourse. Because defibulation routinely tears tissue, the opened

wound comes in direct contact with semen. This wound provides HIV a direct portal of entry into the bloodstream of the woman. Scarring that may occur as the defibulated area heals may lead to repeated episodes of intercourse-related tissue trauma and bleeding.

HIV IN PREGNANCY, CHILDBIRTH, AND BREASTFEEDING

HIV TRANSMISSION DURING PREGNANCY AND CHILDBIRTH

HIV can be passed on from an infected mother to her child before birth, during delivery, or while breastfeeding. Studies to date have shown that between 23% and 42% of babies born to African mothers infected with HIV-1 will become infected via one of these routes. The risk may be higher if the mother acquires the HIV infection during the pregnancy or if she has symptomatic or advanced disease during the pregnancy.³³ Other factors associated with increased HIV transmission from mother to infant are premature rupture of the membranes, preterm delivery, invasive procedures performed during pregnancy (particularly amniocentesis and amnioscopy), chorioamnionitis (infection of the placenta), STIs during pregnancy, hemorrhage during labor, and bloody amniotic fluid.³⁵ Some of these conditions can be prevented by good prenatal care and careful intrapartum management. In particular, screening for and treating STIs (both symptomatic and asymptomatic infections) before pregnancy or as early as possible during pregnancy can help reduce HIV transmission. If the woman has an STI, her partner(s) will need treatment in order to prevent reinfection.

In a multicenter study, HIV-infected pregnant women were given the antiretroviral drug zidovudine (also called ZDV, AZT, or Retrovir) several times a day during the second and third trimester of pregnancy and intravenously during labor and delivery. The newborns were given ZDV syrup for the first 6 weeks of life. Infants whose mothers were treated with zidovudine had an 8.3% chance of infection versus 25.5% in the untreated group.⁵⁶ These infants also had a temporary drop in their hemoglobin level (about 1 gram), with spon-

taneous resolution after the ZDV was completed. A shorter course of zidovudine was tested on pregnant women in Thailand between 1996 and 1998, in which the HIV-infected women took 300 mg. of zidovudine twice a day starting at 36 weeks. During labor, they took 300 mg. every three hours by mouth until delivery. In that study, the HIV transmission rate was 50% less for infants whose mothers took zidovudine (9.2%), versus infants of those who had not received the drug (18.6%). This study greatly simplified the previous regimen, and even though the reduction in HIV was somewhat less, the much lower cost may make it feasible for countries with limited resources. No intravenous drug was used, and the infants were not treated after birth. None of the infants were breastfed, however. In areas where artificial feedings are not feasible, this regimen is not likely to be as effective in reducing perinatal HIV transmission.⁶⁶

Zidovudine has not been widely tested in adults in African nations and will require careful monitoring during initial use in African populations. We do not know if some other drug regimen or type of treatments may be more useful to reduce mother-to-child HIV transmission. One treatment recently tested in Malawi was vaginal cleansing with a 0.25% chlorhexidine solution every 4 hours during labor and delivery.⁹ The entire birth canal and external genitalia were wiped with a cotton swab soaked in the solution. The infants were cleansed in the same manner immediately after delivery. This regimen did not reduce HIV transmission from mother to newborn, except in a subgroup of women whose membranes had been ruptured for longer than 4 hours. In these women, transmission rates were 25% in the vaginal cleansing group versus 39% in the control group. Whether this finding was due to the intervention has not been ascertained, but there were no ill effects reported from the cleansing. In fact, the same study suggested that the chlorhexidine cleansing reduced neonatal and maternal infections in the early postpartum period. Infant mortality from sepsis also was reduced.⁶⁹ Additional studies are needed to answer some of the remaining questions as well as produce an effective, less expensive, and more practical methodology for women in countries with fewer resources.¹⁴

HIV TRANSMISSION DURING BREASTFEEDING

Infants who escape HIV infection during pregnancy and delivery may still become infected by breastfeeding from an infected mother. If the mother was not infected with HIV previously but became infected during the breastfeeding period, the infant's risk of seroconversion is around 29%.¹⁸ If the mother was infected with HIV before the pregnancy, the infant's additional risk of contracting HIV from breastfeeding is estimated at 14%.¹⁸

Breastfeeding provides optimal nutrition, protects infants from many life-threatening infectious diseases, and provides some natural contraceptive benefit (see Chapter 12 on Postpartum Contraception and Lactation). For these reasons, continue to promote breastfeeding among HIV-negative women and women of unknown HIV status. A woman known to have HIV infection should be informed about the risk of HIV transmission through breastfeeding and about other possible feeding options, so that she can make her own decision about whether to breastfeed. HIV-infected women may consider using commercial infant formula only if the family has reliable access to sufficient formula for at least 6 months and has the resources—clean water, fuel, utensils, skill, and time—to prepare it accurately and hygienically.⁶⁴ (See Chapter 12 on Lactation and Postpartum Contraception.) If a woman chooses to use artificial feedings, teach her how to prepare the feedings and how to feed the infant from a cup. Then ask the mother to demonstrate the preparation and feeding so you can be sure she is able to do it safely and correctly.

Some mothers may be stigmatized for using artificial feedings, and some families cannot afford the additional costs for fuel, equipment, and supplies. HIV-infected women who breastfeed must be treated promptly for breast infections and cracked or bleeding nipples because these might increase the baby's risk of acquiring HIV infection. For the same reason, quickly treat an infant that has thrush, ulcerations, or other problems of the mouth.⁶⁴ An HIV-infected woman who breastfeeds may possibly reduce the child's risk of HIV by stopping breastfeeding when the infant is a few months old.¹⁵

INFANT OUTCOMES

Most HIV-infected babies become ill within the first year of life.⁵⁰ Others will not show symptoms for a year or more. The baby with HIV may not gain weight normally or may have repeated bouts of pneumonia, bacterial infections, diarrhea, severe oral candidiasis, and other illnesses. In African countries, the death rate is 21% to 37% for infants born to HIV-infected mothers versus 2% to 4% for infants born to uninfected mothers.³³ Infected infants who survive their first year are likely to die at a young age and rarely live to age 12.

The HIV-infected woman considering pregnancy will need to choose another guardian for the child when she becomes too ill to care for it. The World Health Organization (WHO) estimates that, since the beginning of the epidemic, nine million children under age 15 have lost their mothers to AIDS. Of these maternal orphans, 90% have been in sub-Saharan Africa.⁶³

HIV PREVENTION EDUCATION

Reproductive health care workers are critical agents for HIV prevention, especially where the prevalence of HIV infection is high. Your patients may not be aware of the routes of transmission of HIV or how they can protect themselves. Every patient should have some skill-building on HIV prevention. Ask each patient, "What do you do to protect yourself from AIDS?"²⁵ Your female patients must understand that protecting themselves is the only way to protect their unborn children.

Many reproductive health care patients are already infected with HIV, and most of them are not aware of their infection. These clients need to know how to protect uninfected partners and children. Individual and collective human behavior are the key to HIV containment, and information is the first step to behavior change.

HIV PREVENTION AND SEX

The only way to prevent death from AIDS is to avoid contracting HIV infection. Although vaccines against HIV are being developed, as of the late 1990s, none have been proven effective in humans. Prevention of sexual transmission of HIV is difficult, complex, and requires accurate information, decisions by the patient and partner, and many changes in behavior that may not be easy to master or maintain. Prevention messages to the client should remind her or him: "If you are not infected now, you may still become infected." The following measures will reduce a person's risk of HIV infection (see Table 5:4):

- Mutual monogamy with an uninfected partner
- Abstinence from sex
- Avoidance of alcohol or drug use in situations where they will make a person more likely to have unprotected sex
- Correct use of condoms and water-based lubricants during sex (anal, oral, or vaginal) with anyone who has HIV or whose HIV status is unknown

Even though STIs and HIV have been associated with having multiple sex partners, advice to limit the number of partners becomes less important as the prevalence of HIV climbs. For example, in Kigali, Rwanda, the HIV prevalence among women who had only one lifetime sex partner was more than 20%.² Their male partners had become infected during previous or extramarital sexual relationships, and the women's risk was directly related to their partners' sexual behavior rather than to their own behavior. It does not take many sexual partners to be exposed to HIV when the overall prevalence is greater than 30%, as it was in Kigali.

In the Kigali study,² some individuals were fearful of condoms because they mistakenly believed that condoms could cause sterility or illness in women. This study also found that condom use among couples increased when the male partner came in for HIV testing and counseling. Male partners who refused HIV testing were least likely

to use condoms, and the rate of HIV seroconversion among their female partners was twice that of the group in which the men were tested and counseled. Thus, men should be targeted for education to reduce HIV infection in their wives, sex partners, and children.²

Table 5:4 Safer sex options for physical intimacy

Safe

Massage

Hug

Body rub

Dry kiss

Masturbation

Hand-to-genital masturbation or mutual masturbation

All sexual activities, when both partners are monogamous and known, by testing, to be uninfected with HIV

Possibly safe

Wet kiss with no broken skin, cracked lips, or damaged mouth tissue

Vaginal or rectal intercourse with latex or synthetic condom used correctly

Oral sex on a man using a latex or synthetic condom

Oral sex on a woman using a latex or synthetic barrier such as flexible plastic wrap or a modified male condom (cut open and spread over vulva), especially if she is not menstruating or having a vaginal infection with discharge

All sexual activities, when both partners are in a long-term, monogamous relationship and trust each other

Unsafe in the absence of HIV testing and mutual monogamy

Any vaginal or rectal intercourse without a latex or synthetic condom

Oral sex on a man without a latex or synthetic condom

Oral sex on a woman without a barrier, especially if she is menstruating or has vaginal infection or discharge

Semen in the mouth

Oral-anal contact

Blood contact of any kind, including menstrual blood, or sex that causes tissue damage or bleeding

Adapted from Hatcher, et al. (1994)

An uninfected woman considering sex with a man of unknown HIV status must consider the possibility that he is HIV-infected and realize that she can choose safer activities to reduce risk to her and her future children. These alternatives must be discussed before they prepare for sexual activity. Likewise, an HIV-infected woman considering sex with a man of unknown HIV status must consider that he may be uninfected and talk with him about measures they can take to protect him from infection. To protect their wives and future children, men who know that they are uninfected need to take steps to stay that way. Men who are already infected with HIV must act to keep uninfected sexual partners from contracting the virus.

Women who are interested in protecting themselves from HIV are often doubtful that their sex partners will agree to safer sex measures. Women often say that their main reason for not using condoms is that the man refuses or does not like them. Because women are frequently economically dependent upon their partners, they feel that if they become demanding about such a difficult subject, the man may retaliate or leave. The health care worker may suggest that a woman in such a position come in with her partner for HIV prevention counseling or even HIV testing. Remind your patient that a man who refuses to use condoms with her may be more likely to refuse to use them with his other partners as well, thereby posing a higher risk to all his partners.

Women who are least able to negotiate with their partners for safer sex tend to be younger and disadvantaged by poverty, war, lack of education, and poor job opportunity. Young girls are sometimes forcibly seduced by older men, or men who may give them gifts or money.⁴ Unmarried or divorced women may set up arrangements with one or more men to provide sexual services in exchange for material support. These partnerships may not be stable, and the man often has other sexual partners as well. Women who are unable to find work sometimes sell sexual encounters to feed themselves and their children. Some of these situations are not considered prostitution, but they are still very risky for the women.⁷ Keep in mind too that women and girls are sometimes raped, a practice that may dramatically increase during war and civil unrest.

The vulnerability that stems from poverty and limited job opportunities often means that women do things that they would rather not. A few organizations help women gain property rights, improve their education, receive job training, or get business loans. Learn if any such organizations are in your area so that you can refer women in need of such assistance. Encourage your patients who want out of a risky situation to create a workable plan to do so. Most important, respect a patient's autonomy, even if you do not personally agree with her choices.

Teaching your client the facts about HIV is an essential step, but knowledge alone will not reduce risk. Most people do not absorb this information and translate it into action after hearing it only once. It takes many small steps to action. When a client returns after an educational or counseling visit:

- Applaud any behavior steps in the direction of safety.
- Be sure that you teach in a way the patient can understand.
- Listen and try to understand the client's questions and concerns.
- Allow the client to determine what steps to take toward reducing HIV risk and protecting her or his family.
- Offer to teach or refer the client's partner, if the partner is unwilling to accept information from your client.

If your client does bring in a sex partner, either or both of them may want an HIV test. They may choose to take other types of precautions, such as using condoms. He may elect to cease extramarital relationships or use of commercial sex workers. *Each step toward safer living must be supported.*

PREVENTION AND BLOOD TRANSFUSIONS

Blood donors have differing HIV prevalence rates, depending on their country and region. Volunteer donors are less likely to be infected than paid donors.⁸ In Uganda, donors recruited by family members were more than twice as likely to test HIV-positive than vol-

unteer donors recruited by the national blood center.⁶¹ All donated units should be tested by a sensitive HIV screening test and positive units discarded. If confirmatory testing is available, the donor should be counseled about his or her HIV-positive status and advised never to donate blood, semen, or tissue. (See the section on HIV test counseling, this chapter.) One blood collection center in Zimbabwe defers all donors with a history of genital ulcer or STI. This step reduces the number of HIV-infected blood units which must be discarded, thereby saving money,³⁹ and lessens the chance that the collected blood will test negative for HIV during the "window period" (described below), even though the infection can be passed on to the recipient.

THE HIV TEST

TEST METHODOLOGY

Standard HIV testing does not detect HIV directly. Instead, it detects the *antibody* to HIV produced by the infected person's immune system. It is like seeing an elephant's footprints—even though you don't see the elephant, you can see that he's been there. This antibody can be detected in blood, or with some of the newer tests, in saliva or urine.

Because a delay occurs between infection and antibody production, the HIV test is not helpful immediately after exposure to the virus. Most people take *6 weeks to 6 months* to show a positive test after HIV infection has taken place. During this window period, the HIV antibody test will be negative, even if the person is infected and is capable of infecting others. After an infected person has produced enough antibody to be detected on the HIV test, future HIV tests will be positive.

If the HIV screening test is negative, the person is considered uninfected, assuming that the window period has already passed. A negative confirmatory test is not needed. A positive screening test is generally confirmed with a more specific test, however, because of the high rate of false-positive screening tests. Some fairly simple confirmatory tests are available.¹¹ Different combinations of rapid screening

and confirmatory tests are being used for areas with limited resources, which helps to reduce costs and technical demands. All HIV testing is subject to error, and laboratory workers with less experience have higher rates of false results. Be familiar with the testing procedure and speak with the laboratory personnel who perform the test to understand the screening accuracy in your area.

SCREENING TEST LIMITATIONS

If the only available test on-site is a single screening test, advise your client that a negative result can be relied on unless he or she is in the window period. If the screening test is negative, the post-test counseling for negative tests should be used. If the screening test is positive, the patient must be advised that the first part of the HIV test was positive, then referred to a location that can perform a confirmatory test. Because this patient is likely to be infected, advise safer sex precautions until the confirmatory test is completed. If the confirmatory test is negative, the post-test counseling for a negative test is used at this time. If the confirmatory test is positive, the post-test counseling for positive results is used.

TESTING INFANTS

Up to the age of about 15 months, the infant carries the mother's HIV antibody. Therefore, testing a newborn with the standard HIV antibody test will actually test the mother. After the age of 15 months, the maternal antibodies are cleared from the child's blood, and the child can be tested to determine its HIV status.³³ It is very important that HIV-infected infants and children, who are especially vulnerable to infection, receive immunizations (see Table 5:5).

In some research centers, tests that directly detect HIV can be performed on infants as young as 6 months. Because it is possible that an uninfected baby will become infected later through breastfeeding, such tests are more useful in situations where artificial feedings can be safely used. The tests are also relatively expensive and technologically impractical for widespread use at this time.

Table 5:5 Immunizations recommended for children with HIV infection

Vaccine	Recommendation
Measles vaccine	Children with known or suspected HIV should receive measles vaccine at 6 and 9 months, because of their risk of severe measles.
Diphtheria-tetanus-pertussis vaccine	Administer the same dose and schedule as for immunocompetent children.
BCG	BCG is not recommended for children with symptomatic HIV. In regions where the risk of TB infection is high, it should be given to asymptomatic children. BCG is not recommended for adults.
Oral polio vaccine (OPV)* Enhanced inactivated polio vaccine (IPV)	Children with AIDS should receive IPV. Asymptomatic children may be given OPV on the usual schedule.
Yellow fever	May be given to asymptomatic children, but not to those with symptoms.
Pneumococcal vaccine	Administer to HIV-infected children at 2 years of age.
Hepatitis B vaccine	Administer the same dosage and schedule as for immunocompetent children.
Live vaccines (e.g., typhoid, varicella zoster, and vaccinia)	Live vaccines are not generally recommended for people with HIV.

NOTE: In urban areas, children may also be given Pneumococcal vaccine at age 2, and an annual influenza vaccine each year starting at age 6 months. Adults with HIV also may benefit from these immunizations if they are available.

*If OPV is given to a person, close contact between the OPV recipient and the immunocompromised infant should be avoided for approximately 1 month after the vaccination. OPV has not been harmful when administered to asymptomatic HIV-infected children, but some immunocompromised children may be unable to limit the vaccine virus' replication, which can result in severe, progressive neurologic involvement.

Source: WHO (1998) and Scarlatti (1996)

HIV COUNSELING

HIV counseling is a unique opportunity to learn about the patients' needs, risks, and understanding about HIV and AIDS. The counselor can correct misinformation and help the patient reduce the risk of getting HIV if the client is HIV-negative, or the risk of giving it to others if the client is HIV-positive. Your patient may have received inaccurate or incomplete information from friends and family. He or she may have heard about HIV and AIDS from other sources, such as pamphlets, posters, and mass media campaigns, but may not have changed his or her behavior. Sometimes a person will mistakenly change behavior in ways that do not actually reduce risk, for example, by taking only younger sexual partners, or by selecting partners who "look healthy."

The health care worker can use this time to emphasize facts and to teach patients how to effectively reduce the risk of HIV and AIDS for themselves and their families. The two-way conversation with the health care worker not only helps to highlight actual risks for that patient, but also gives the client a chance to ask those questions that are personally important to him or her. Counseling may include referring the patient to support groups, post-test clubs, and other services that improve the patient's and family's well-being.

PRE-TEST COUNSELING

Counseling before the HIV test must be a complete and thorough review of facts. The client cannot be expected to absorb much information at the post-test counseling session because of emotional reactions to the test results. All important information must be given before HIV testing, and 15 to 30 minutes should be allotted for this session. It is usually impractical for the primary care provider to spend this much time with a patient; other workers—counselors, assistants, or even volunteers—can be taught to perform this important task.

The first component of pre-test counseling is a basic explanation of what the HIV test is, including test limitations. For example, if the

patient is in an ongoing sexual relationship with someone suspected to have HIV, the test will need to be repeated 6 months after the last unprotected sexual contact with that person. If the patient was recently transfused, it is best to wait 6 months before HIV testing to avoid the window period, when the test may be negative despite actual infection. Pre-test counseling also is used to ascertain that the client's consent to be HIV-tested is an informed and voluntary one.

The client must understand that the test detects antibody to HIV, the virus that causes AIDS. Even if the HIV test is positive, the client may be healthy for months or years. The health care worker should advise on the possibility of a false positive or false negative test. This possibility depends on the types of HIV tests available and the expertise of the laboratory personnel performing them.

PRE-TEST DISCUSSION OUTLINE

1. Explain that the virus is in the semen, vaginal, and cervical secretions, and blood of infected people. Review the routes of HIV transmission:
 - Having sex (use language that the patient understands)
 - Receiving an infected blood transfusion
 - Giving birth (the infant is at risk)
 - Breastfeeding (the infant is at risk)
 - Re-using blood-contaminated injection equipment
2. Your client also must understand ways the virus is *not* transmitted:
 - Living in the same house
 - Working together
 - Insect bites
 - Sharing bathrooms
 - Hugging
 - Food preparation
 - Sharing dishes or eating together

3. Discuss measures that the client can take to avoid exposing sex partner(s) to HIV, in case she or he is infected:
 - Devise a plan for informing partner(s) that she or he is taking the test and why they will be using condoms or other precautions
 - Rehearse what the client will say to the partner
 - Allow the client to bring in the partner so that the client can talk to the partner in the presence of the counselor and questions can be answered
 - Set up a time to counsel and offer to test the partner for HIV, if that is desired by the client
4. Review confidentiality of the test with the client:
 - Who will receive the lab result
 - Whether the result will be reported to the local health authority or the government
 - Where the test result will be stored, and who will have access to it
 - How and when the client will receive the result (if a couple wants to receive their results together, they should consent separately to do so)
5. Legal ramifications of the test vary from country to country, and sometimes from state to state. The counselor must know the local regulations that apply to HIV test results and people with HIV infection and be able to discuss them with clients.
6. Set up an appointment for the client to return for test results:
 - Allow enough time for both the screening and confirmatory tests to be completed before the return date.
 - Help the client cope with anxiety while waiting for the test results.
 - Assist in developing specific plans about who the clients can talk with, post-test clubs that may be available to them, and any local resources, including the possibility of a return visit to the counselor.

Often, the client may not be entirely comfortable with a frank discussion of sexual practices. Health care workers, too, must work to

overcome their own discomfort with discussing sexual matters openly, because understanding is essential for preventing transmission of this deadly virus. HIV is commonly a topic of much misunderstanding and unfounded fears. Occasionally, people are more afraid that they will get HIV from sharing a meal than from sexual activity. Pre-test counseling is an excellent time to dispel such mistaken notions.

POST-TEST COUNSELING

Positive HIV Test Result

Greet the client and seat him or her in a quiet, private place. Be sure you have adequate time to deal with the emotional reactions that may occur. Gently explain that the results were positive, meaning that he or she is HIV-infected, but may not develop AIDS for some time (if the patient has not already developed AIDS). Allow the client to react and ask questions, keeping in mind that a wide range of expressions may be considered normal upon learning this news:

- Anger
- Denial
- Numbness
- Sadness
- Fear
- Anxiety

Often, people ask for specific predictions about their survival and how long they can expect to be healthy. Help your patient understand that the future is dependent on many factors, most of which are unknown at this time.

- You can transmit HIV to others through unprotected sex or by donating blood to them. Women can pass it on to unborn children or through breastfeeding infants.
- You may have contracted the virus from a current or a past sex partner or through receiving a blood transfusion. You may or may not already have transmitted it to a more recent partner.

- Stay as healthy as possible to try and slow the onset of symptoms and progression of disease:
 - Avoid unprotected sex to prevent STIs.
 - Get a tuberculosis skin test and follow recommendations for prevention.
 - Eat nutritious foods.
 - Get adequate exercise.
 - Get enough rest and sleep.
 - Try to stop smoking.
 - Obtain recommended immunizations (see Table 5:5).
 - Reduce or stop alcohol and other drug use.
- If area support groups exist, give them a try.
- Be sure you have adequate condom supplies if you have a sex partner or partners.
- Know how to use condoms and use them correctly, *every time*.
- It may make it easier to practice safer sex in your relationship if your partner comes in for testing and counseling as well.
- Remember that drinking alcohol or using mood-altering drugs may cloud judgment, and increase likelihood of unsafe sexual behavior.
- Learn sources of good treatment. Unscrupulous people in every country prey on the hopes and fears of people with HIV and AIDS, promising miracle cures in exchange for large sums of money. Such predators can bankrupt entire families with their lies.

Negative HIV Test Result

Greet the client and seat her or him in a quiet location. Explain that the results were negative, which could mean several things:

- The client may not have been exposed to HIV.
- The client may not have been infected when he or she was exposed to the virus. This may not be the case next time the client is exposed.

- The client may have become infected very recently. If he or she was infected less than six months ago, the test may not yet show the infection.

Discuss with the client how to avoid HIV infection in the future (see Table 5:4):

- Abstinence
- Mutually monogamous sex with an uninfected partner
- Use of condoms and water-based lubricant during sex (anal, oral, or vaginal) with anyone of unknown HIV status
- Avoid alcohol or drug use, especially in situations that may make you more likely to have unprotected sex

SAFETY FOR THE HEALTH CARE WORKER

In many medical settings, a small risk of HIV transmission from a patient to a health care worker exists because of invasive examinations and procedures. These procedures may bring the health care worker into contact with infectious materials such as blood or amniotic fluid, which may then be accidentally introduced into the body of the health care worker. *Blood is the single most important source of HIV in health care settings.* Blood or bloody fluid has been implicated in every documented transmission of HIV to health care workers in clinical settings to date. Other body fluids have been found to contain HIV, but so far have not been implicated in work-related HIV infections (see Table 5-6).

Because of the seriousness of HIV and other blood-borne infections, precautions must be taken to decrease the health care worker's chances of exposure. All patients must be treated cautiously, as if any one of them may have potentially serious infections. The practice of treating all patients as potentially infectious is known as *universal precautions*, and includes:

- Wearing waterproof gloves (rubber, latex, or vinyl) to clean infectious spills
- Using disinfectant solutions to clean infectious spills
- Handling sharp instruments carefully until they have been sterilized

- Using waterproof gloves for pelvic and genital exams
- Using gloves for any procedures that may involve contact with or potential spilling or splashing of potentially infectious bodily fluids
- Educating health care workers about the risk of HIV and hepatitis B, how they are transmitted, and how to avoid them in the health care setting

Table 5:6 Potentially HIV-infectious versus non-HIV-infectious bodily fluids in medical settings

Infectious	Non-infectious*
Blood	Nasal mucus
Amniotic fluid	Sputum
Cerebrospinal fluid	Saliva
Synovial fluid	Tears
Pericardial fluid	Sweat
Peritoneal fluid	Earwax
Semen	Feces
Vaginal/cervical secretions	Urine
Any secretion visibly contaminated with blood	Vomit
	Breast milk [†]

*Unless visibly contaminated with blood.

[†]Because HIV has been found in small quantities in some breast milk and is implicated as a route for transmission to nursing infants, gloves may be worn by workers in situations with exposure to large volumes of breast milk.

Source: Centers for Disease Control (1988)

Accidental HIV exposures most often occur when blood-contaminated sharp instruments, such as needles or scalpels, break the skin of the health care worker. Rarely, infectious materials enter the body of the health care worker through open lesions, broken skin, or mucous membranes (eyes, mouth, nose). Because there is no easy way to tell who is HIV-infected and who is not, it is important to guard against injury with contaminated instruments or splashes by infectious body fluids with *all* patients. Analyze each work setting and each procedure for specific potential risks, and take action to reduce those risks.

The risk of contracting HIV, even with injury, is extremely small. U.S. data show that, after a puncture wound with a hollow-bore injection needle or sharp instrument which was contaminated with blood from an HIV-infected patient, the HIV seroconversion rate averages 0.3%.²¹ The risk appears to be smaller for splashes on mucous membranes or broken skin.

A 1995 case-control study of European and U.S. workers showed variable levels of HIV risk from different kinds of workplace exposures.⁵⁷ Groups of health care workers who had become infected with HIV from exposures at work were compared to those who had reported work-related exposure to HIV but had not become infected. The researchers sought to determine which factors were associated with increased risk of work-related HIV infection. All of the workers who acquired HIV infection had been exposed to the blood of an HIV-infected person. Almost all (94%) had a needlestick injury with a hollow-bore (injection) needle previously used on an HIV-infected patient; the rest had sustained punctures or lacerations with other sharp objects such as lancets or scalpels. Many more workers with deep punctures or wounds were in the group who actually contracted HIV infection. Other high-risk conditions were terminal illness (end-stage AIDS) in the source patient, puncture with a visibly bloody device, or injury with a needle that had been placed directly in the vein or artery of the source patient.

This same study showed that workers who did not seroconvert were more likely to have taken zidovudine after the exposure. In 1996, because of this apparently protective effect, the U.S. Public Health Service recommended that workers reporting a parenteral exposure to HIV-contaminated blood be offered a 4-week course of antiretroviral medications, called post-exposure prophylaxis, in an attempt to abort HIV infection.⁵⁸ These recommendations were based on a small study, however, and not everyone who took antiretroviral drugs avoided HIV infection. Potential candidates for this prophylaxis must be apprised of this and the potential for side effects and toxicity of the drug(s) to be used.

Post-exposure prophylaxis, if used, is best started within 1 to 2 hours of the HIV exposure, but no later than 72 hours after exposure.

Even without antiretrovirals, 99.7% of workers exposed to HIV-contaminated needlesticks would be expected to remain uninfected.²¹ Toxicity, expense, refusal by the health care worker, low risk of seroconversion, and lack of drug availability are common reasons for not using post-exposure prophylaxis.

If a health care worker has an HIV exposure by injury with a contaminated needle or instrument or by contact of potentially infectious fluid (see Table 5:6) with broken skin or mucous membranes, the following steps must be taken as soon as possible:

- Immediately wash the area thoroughly with plenty of soap and water. In the case of eye or mucous membrane splashes, rinse with large amounts of water.
- Apply disinfectant to broken skin after cleansing.
- Report the injury to a supervisor.
- If the source patient is known, see if it is possible to find out if the patient has HIV.
- If the source patient is unknown or is known to be HIV-infected, proceed with HIV testing of the health care worker.
- Request an HIV test on the health care worker as soon as possible, preferably within 24 hours, but certainly within 1 or 2 weeks.
- Repeat HIV testing 6 months and 12 months after the injury to determine if HIV seroconversion took place. If the worker has used safer sex measures and had no blood transfusion during the year and still seroconverted to a positive HIV test, it is assumed that he or she contracted HIV from the workplace exposure.

The initial HIV test is a baseline test, which takes advantage of the delay between exposure and conversion, or the window period. Its purpose is to determine if the worker already was HIV-infected at the time of the exposure. If the worker is positive at this time, the HIV infection is not related to the proximate injury. The employee must also be counseled pre- and post-test, much as a patient would be. (See the sections on Pre- and Post-Test Counseling, this chapter.) Advise

the worker to use barriers and practice safer sex with partner(s) until he or she completes the follow-up HIV tests.

These guidelines will help prevent many occurrences of occupational (work-related) HIV transmission and track those that occur. It is easy for health care workers to over-estimate their risk of becoming infected with HIV at work while downplaying risk from off-the-job activities. Most health care workers contract HIV by the same routes others do.¹² It is important for those in health care to be aware of all risks and to make adjustments to reduce them if possible.

Theresa and her two children lived quietly with her mother, helping with the house and farm. She was afraid to tell her family what had killed her husband, and every day she wondered if she was infected. She refused all offers of courtship, because she knew that if she carried HIV, she could give it to the man she loved. After nearly a year, she found out that a clinic where her aunt lived could test for the virus. She left her children with her mother and took a little money she had saved, saying only that she was going to visit her aunt. She had to wait several days for the test, and more for the result, but she felt very lucky when she found she was not infected. She went back to her mother's village and decided that, before she considered remarrying, she would find a way to avoid exposing herself, and her future children, to such a risk again.

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Sexually Transmitted Infections

"How long have you had this discharge?" asked the nurse. "A few weeks" was the answer. "Does your husband have a discharge?" The answer was "no," but the patient added that her husband was frequently away from home on business. Out in this rural clinic, the nurse did not have diagnostic equipment. She checked the algorithm for discharge and other complaints. The woman's symptoms and risks were suspicious of a sexually transmitted infection. She was treated with spectinomycin.

Sexually transmitted infections (STIs) are a major public health problem in Africa and now rank among the leading causes of illness in many African countries.^{21,30} Like diarrheal disease, malaria, measles, malnutrition, and tuberculosis, STIs are costly to society and result in increased health care expenditures and lowered levels of productivity.^{21,37} STIs can lead to severe health consequences, especially in women and children.^{34,37} In addition, STIs facilitate the transmission of human immunodeficiency virus (HIV).³⁶ Sequelae of STI include chronic pain, infertility, ectopic pregnancy, and genital cancers in adults and severe illness or death in newborns. Long-term consequences of STIs are evident when examining patterns of infertility in Africa. An estimated 85% of infertile African women have diagnoses attributable to a previous sexually transmitted infection, a percentage

markedly higher than in other regions of the world.⁷ In parts of sub-Saharan Africa, where STI prevalence is high, as many as 30% to 50% of couples may be infertile.³⁷

Because most women attending family planning centers are at risk for both pregnancy and STIs, family planning clinicians can serve an important role in preventing STIs.^{10,20} Often, the family planning clinic is the only health care provider routinely seen by clients at risk for STI. Thus, family planning clinicians must be able to diagnose and treat STIs in their clients. The World Health Organization (WHO) has distilled practical considerations in case management for STI control into four brief recommendations that can guide family planning clinicians:³⁹

- Educate persons at risk on the modes of disease transmission and the means of reducing the risk of transmission.
- Detect infection in asymptomatic persons and in persons who are symptomatic but unlikely to seek diagnostic and therapeutic services.
- Effectively manage persons who are infected.
- Treat and educate sex partners of persons with an STI.

In this chapter, we provide general background about STI management in the family planning setting and review current approaches to diagnosing and treating the most common STIs.

OVERVIEW OF SEXUALLY TRANSMITTED INFECTIONS

The term "sexually transmitted infection" has gradually replaced the term "venereal disease." This shift in terminology recognizes both an expanded awareness of infectious disease transmitted through sexual contact, as well as an expanded array of diseases. Today, more than 20 separate organisms and syndromes are classified as STIs.²⁰ Infection is usually transmitted during unprotected sexual intercourse with an infected partner. This includes vaginal, anal, and oral intercourse.³⁰ STIs can also be transmitted from the mother to the fetus during pregnancy or to the newborn at delivery.³⁰

STIs are caused by bacterial, parasitic, or viral pathogens. Some of the more common pathogens are *Chlamydia trachomatis*, herpes simplex virus 2 (HSV-2), human papillomavirus (HPV), *Neisseria gonorrhoea*, *Treponema pallidum*, *Trichomonas vaginalis*, hepatitis B virus (HBV), and human immunodeficiency virus (HIV). There are also a variety of syndromes associated with STIs. Some of these syndromes, such as pelvic inflammatory disease (PID), are actually complications of STIs; some are caused by genital tract infections that are not transmitted by sexual intercourse (such as bacterial vaginosis), but are associated with it. The organisms, symptoms, diagnoses, and treatment regimens for those STIs most common in Africa are listed in Table 6:1.

Bacterial and parasitic genital infections, such as *C. trachomatis*, *N. gonorrhoea*, *H. ducreyi*, and *T. pallidum* are fully curable with antibiotics. Conversely, viral infections, such as HBV, HSV-2, HPV, and HIV, cannot be cured, although their complications can usually be minimized. Thus, primary prevention is recommended for control of persistent viral STIs.³⁵ Laboratory testing is preferred for diagnosis, but most African health clinics do not have the resources to perform serologic tests or cultures for STI. Consequently, microbial causes of infection usually cannot be identified. As an alternative, clinicians in Africa and throughout the world are diagnosing STIs presumptively by clinical signs and symptoms of infection (such as genital ulcer, vaginal or urethral discharge, or pelvic pain) rather than microbial causes of infection. We have included a detailed discussion on "syndromic management" of STIs later in this chapter.

The acquired immunodeficiency syndrome (AIDS) warrants special mention. AIDS is caused by HIV, which gradually destroys the immune system, and the disease usually results in death. Although AIDS is now pandemic, Africa has been most severely affected. An estimated 13.3 million adults and more than a half million children in Africa are infected with HIV.⁴¹ Most (80% to 95%) cases of HIV infection in Africa have resulted from penile-vaginal intercourse.²⁹ Chapter 5 contains a comprehensive discussion of HIV and AIDS.

Table 6:1 Overview for clinical management of some common sexually transmitted infections

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
<p>Bacterial vaginosis, Anaerobic vaginosis</p> <p>Clinical syndrome of anaerobic vaginal bacteria (e.g., Gardnerella vaginalis, Mycoplasma hominis, and other anaerobes) overgrowing normal lactobacilli</p>	<p>Excessive or foul-smelling vaginal discharge. Other signs include erythema, irritation, and intense itching of the external genitalia. Frequently assumed to be normal discharge by developing world women.</p>	<p>Presumptive diagnosis: Typical symptoms of vulvovaginitis, elevated vaginal pH (>4.7), and presence of clue cells in saline wet mount or gram stain of vaginal discharge. Diagnosis enhanced with fishy odor of vaginal discharge after addition of 1-2 drops of 10% potassium hydroxide (KOH). Cultures are not useful. Only symptomatic women need to be treated. Male sex partners do not.</p>	<p>Recommended regimens: Metronidazole 400-500 mg PO twice a day for 7 days OR Metronidazole 2 g PO once</p> <p>Metronidazole is contraindicated during the first trimester of pregnancy but may be used, if necessary, during the second and third trimesters. Data on alternative regimens are very limited. Clindamycin 300 mg PO twice a day for 7 days has been used successfully, and this regimen would be safe in pregnancy.</p>	<p>Understand how to take or use any prescribed medications. Avoid drinking alcohol until 24 hours after completing metronidazole medication.</p>
<p>Chancroid (Hemophilus ducreyi)</p>	<p>Frequently asymptomatic in women. Symptoms appear 3-10 days after infection. Typically a single (sometimes multiple) painful, irregularly-shaped genital ulcer. Ulcer is soft, and its base may be covered with grey purulent exudate. Ulcer usually on the penis or at entrance to vagina or anus. Ulcers usually disappear without treatment in about 1 month. Painful inguinal adenopathy (tenderness of groin) in 50% of cases.</p>	<p>Presumptive diagnosis: Clinical presentation consistent with chancroid, a unilateral bubo, or both. Diagnosis by exclusion of other STDs causing genital ulcers: negative darkfield microscopy or serologic testing (syphilis) AND inconsistent clinical presentation of ulcer(s) or negative culture (genital herpes).</p> <p>Definitive diagnosis: Identification of H. ducreyi on special culture media.</p>	<p>Recommended regimen: Erythromycin 500 mg PO 3 times a day for 7 days.</p> <p>Alternative regimens: Ciprofloxacin 500 mg PO once OR Ceftriaxone 250 mg IM once OR Spectinomycin 2 Gms IM once OR Trimethoprim (80 mg)/ sulphamethoxazole (400 mg) 2 tablets twice a day for 7 days.</p> <p>The latter regimen has been shown to be less effective in some parts of Africa and should only be used in areas where in vitro resistance rates are low and monitored regularly. Due to widespread resistance, tetracycline and penicillins should not be used.</p>	<p>Obtain HIV testing because genital ulcers are associated with HIV. Refer sex partners for treatment. Carefully clean ulcerative lesion(s) 3 times a day. Use condoms to prevent future infections.</p>

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
Chlamydia (Chlamydia trachomatis)	Sexually transmitted infections caused by <i>C. trachomatis</i> . Symptoms usually appear 7-21 days after infection and include purulent cervical discharge or watery, white or yellow urethral discharge. Other symptoms include spotting after sexual intercourse, pain on urination, and lower abdominal pain. Can lead to PID, ectopic pregnancy, and infertility in women and chlamydial ophthalmia and pneumonia in newborns. Often, men, and especially women, have asymptomatic infections.	Presumptive diagnosis: Diagnosis usually by exclusion, in the absence of culturing techniques. In symptomatic women, presence of yellow mucopurulent endocervical exudate. In asymptomatic women, presence of ≥ 10 PMN leukocytes per $\times 1,000$ field on Gram-stain of endocervical mucus. In symptomatic men (with negative gonorrhea tests), white blood cells on Gram stain of urethral discharge OR sexual exposure to an NGU-causing agent. In asymptomatic men (with negative gonorrhea tests), ≥ 4 PMN leukocytes per $\times 1,000$ field on intraurethral smear.	<p>Recommended regimens: Doxycycline 100 mg PO twice a day for 7 days OR Tetracycline 500 mg PO 4 times a day for 7 days.</p> <p>Tetracyclines are contraindicated during pregnancy.</p> <p>Alternative regimens (for patients in whom tetracyclines are contraindicated or not tolerated): Erythromycin 500 mg PO 4 times a day for 7 days OR, if erythromycin is not tolerated, Sulfisoxazole 500 mg PO 4 times daily for 10 days. Equivalent doses of other sulphonamides may be used. Azithromycin 1 g PO once is effective treatment for chlamydia urethritis, but because its efficacy has not been proven in non-gonococcal urethritis, it should only be used where a chlamydial aetiology has been proven. This regimen is also expensive. (Gonorrhea resistance has been documented. This resistance, plus expense and side effects from a 2 g PO dose, make this regimen inadvisable for dual treatment.)</p>	Sex partners must be treated. Use condoms to prevent future infections.
		<p>Definitive diagnosis: Diagnosis by observed growth on cycloheximide-treated McCoy cells. Fluorescent monoclonal antibody stains or enzyme immunoassay tests may be available. Future use of DNA amplification techniques may increase sensitivity.</p>		

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
Genital warts (Condyloma acuminata)	Appear as single or multiple, soft, dry, painless, skin-colored growths around the vulvovaginal area, penis, anus, urethra, or perineum. In women, growths may occur on vaginal or cervical walls and not be noticed. Symptoms appear from one to several months after infection. HPV cannot be cured, even if warts disappear. Can cause cervical and other genital cancers in adults.	Presumptive diagnosis: By typical clinical presentation on the external genitalia or of koilocytosis on Pap smear specimens. Colposcopy may aid in diagnosis of certain cervical lesions. Exclude possibility of condylomata lata (flat, moist lesions) with darkfield microscopy or serologic tests for syphilis.	Regimens for external genital, perianal, vaginal warts: (Physical) Cryotherapy with liquid nitrogen, solid carbon dioxide, or cryoprobe OR electrocautery OR surgical removal. (Chemical) Podophyllin, 10-25% in compound tincture of benzoin should be applied to warts, avoiding normal tissue. Wash off warts thoroughly 1-4 hours after podophyllin application. Podophyllin should not be used for anal, urethral, oral, or cervical warts, and is contraindicated during pregnancy and lactation. OR Trichloroacetic acid (80-90%) applied to warts weekly.	Sex partners do not need to be examined, as most are already infected. However, anogenital warts are contagious to uninfected sex partners. Use condoms to prevent infection to uninfected sex partners. Because HPV is incurable, warts can reappear after removal.
Human papillomavirus (HPV)		Definitive diagnosis: By biopsy, but usually unnecessary. Very atypical lesions, where neoplasia is a consideration, should be biopsied before therapy. Some warts in the anogenital area are associated with genital dysplasia or carcinoma. A pap smear of cervical lesions shows typical cytologic changes.		
				Note: Treatment of cervical warts should not start until a satisfactory cervical smear is obtained. Management should be carried out in consultation with an expert.

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
Gonorrhoea (Neisseria gonorrhoea)	<p>Symptoms usually appear 1-14 days after infection. Symptoms in men include pain on urination, increased frequency of urination, and yellow or white purulent urethral discharge. Up to 25% of infected men may be asymptomatic. Often asymptomatic in women. When present, symptoms include abnormal vaginal discharge, pain on urination, spotting after sexual intercourse, lower abdominal pain, and abnormal or painful menses. Infection can cause PID and sterility in women; urethritis, epididymitis, and sterility in men; and; ophthalmia neonatorum in newborns.</p>	<p>Presumptive diagnosis: Microscopic identification of typical Gram-negative intracellular diplococci on smear of urethral exudate (men) or endocervical material (women) OR growth on selective medium demonstrating typical colonial morphology, positive oxidase reaction, and typical Gram-stain morphology.</p> <p>Definitive diagnosis: Growth on selective medium demonstrating typical colonial morphology, positive oxidase reaction, and typical Gram-stain morphology, and confirmed by sugar utilization, coagglutination, or antigenococcal fluorescent antibody testing.</p>	<p>Recommended regimens: Ceftriaxone 125 or 250 mg IM once OR Cefixime 400 mg PO once OR Spectinomycin 2 g IM once OR Ofloxacin 400 mg PO once OR Ciprofloxacin 500 mg PO once (contraindicated in pregnancy); however, gonorrhoea resistance to ciprofloxacin has been documented.</p> <p>Alternative regimens: Kanamycin 2 g IM once OR Trimethoprim (80 mg)/sulphamethoxazole (400 mg), 10 tablets PO once daily for 3 days.</p> <p>Kanamycin and Trimethoprim/sulphamethoxazole should only be used in regions where N. gonorrhoea are susceptible and susceptibility and is monitored at regular intervals. Second-line treatment with recommended drugs should be available.</p>	<p>Refer sex partners for examination and treatment. Avoid having sex until you and your partner(s) are completely cured. Understand how to take any prescribed oral medications. Use condoms to prevent future infections.</p>
			<p>PLUS concurrent antichlamydia therapy such as: Doxycycline 100 mg PO twice a day for 7 days.</p>	

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
Granuloma inguinale (donovanosis) (Calymmatobacterium granulomatis)	Symptoms appear 8-80 days after infection. Single or multiple nodules appear below the skin at the site of inoculation. Nodules break through to form granulomatous ulcers that are painless, bleed on contact, and enlarge slowly. In men, ulcers appear on glans and prepuce of penis. Women are frequently asymptomatic.	Presumptive diagnosis: Typical clinical presentation is sufficient. Resolution of lesions after antibiotic therapy supports diagnosis. Definitive diagnosis: Microscopic exam of scrapings of biopsy specimens from the ulcer margin reveals typical Donovan bodies. Tissue culture not feasible.	Recommended regimen: Trimethoprim (80 mg)/sulphamethoxazole (400 mg), 2 tablets twice a day for a minimum of 14 days and until lesions have completely re-epithelialized. Alternative regimens: Doxycycline 100 mg PO twice a day for 7 days OR Tetracycline 500 mg PO 4 times a day.	Understand how to take any prescribed oral medication. Refer sex partner(s) for examination.
Hepatitis B Hepatitis B virus (HBV)	Most HBV infections are clinically inapparent. When present, symptoms usually develop 1-9 months after contact and include serum sickness-like prodrome (skin eruptions, urticaria, arthralgias, arthritis), anorexia, vomiting, headache, fever, dark urine, jaundice, and moderate liver enlargement. Long-term complications include chronic hepatitis, cirrhosis, hepatocellular carcinoma, hepatic failure, and death.	Presumptive diagnosis: By typical clinical symptoms and exposure to a patient with presumed or definitive HBV infection. Definitive diagnosis: Serodiagnosis of HBV infection.	No known cure. HBV is the only STD that has a vaccine. Vaccination of all newborn infants and adolescents is recommended. Persons with a recent STD and those with more than one sex partner in the previous 6 months also should receive HBV vaccine.	Persons at risk for sexual transmission of HBV are also at risk for HIV and other STDs. Condoms should be used to prevent future infections. Sex partners should be examined immediately. Vaccination can prevent infection among persons exposed sexually to HBV if administered within 14 days of exposure.

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
<p>Herpes genitalis [Herpes simplex virus (types 1 & 2)]</p>	<p>HSV-2 is more common in genital disease. Single or multiple small vesicles, usually pruritic, on the genitalia. Vesicles spontaneously rupture to form shallow ulcers that may be very painful. Other symptoms include pain on intercourse, pain on urination, discharge, fever, and malaise. Initial symptoms appear 1-26 days after infection. First clinical occurrence is called first episode infection. Subsequent occurrences are usually milder and called recurrent episodes. HSV can be transmitted to newborns during vaginal delivery and cause neonatal herpes. Risk of transmission is highest with primary infection.</p>	<p>Presumptive diagnosis: Usually by clinical judgment. Likely when typical genital lesions are present or a pattern of recurrence has developed. Further supported by direct identification of multinucleated giant cells with intranuclear inclusions in a clinical specimen prepared by Papanicolaou or other serological techniques.</p> <p>Definitive diagnosis: HSV virus tissue culture demonstrates the characteristic cytopathogenic effect following inoculation of a specimen from the cervix, urethra, or base of a genital lesion.</p>	<p>No known cure. Symptoms can be modified with acyclovir treatment as soon as possible following onset of symptoms. Topical therapy with acyclovir produces only minimal shortening of the duration of symptomatic episodes and is not recommended.</p> <p>Recommended regimens: First clinical episode: Acyclovir 200 mg PO 5 times a day for 5 days. (Treatment can be expected to reduce formation of new lesions, duration of pain, time to healing, and viral shedding; however, treatment will not influence the natural history of recurrent disease.)</p> <p>Recurrences: Acyclovir 200 mg PO 5 times a day for 5 days. Suppression of recurrent outbreaks (>6 per year): Acyclovir 200 mg 3 times a day PO continuously.</p>	<p>Keep involved area clean and dry. Refrain from sexual contact during symptomatic periods. Understand that HSV can also be transmitted during asymptomatic periods. Use condoms to minimize exposure to infection.</p>

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
Lymphogranuloma venereum (LGV)	Genital lesion is a small, painless vesicle or non-indurated ulcer (often unnoticed). Inguinal adenopathy (buboes) follows 1-4 weeks after. Women may be asymptomatic, although some experience lower back pain and inguinal buboes. Symptoms appear after 3-12 days for genital lesion and after 10-30 days for inguinal bubo. LGV can cause cervicitis, urethritis, and enlargement of genitalia.	Presumptive diagnosis: Often diagnosed clinically and should be differentiated from chancroid. A titer of 1:64 on the LGV complement fixation test is considered diagnostic.	Recommended regimens: Doxycycline 100 mg PO twice a day for 14 days OR Tetracycline 500 mg PO 4 times a day for 14 days. Alternative regimens: Erythromycin 500 mg PO 4 times a day for 14 days OR Sulphadiazine 1 g PO 4 times a day for 14 days. Other sulphonamides can be used in equivalent doses.	Understand how to take any prescribed oral medications. Refer sex partner(s) for examination as soon as possible.
[Chlamydia trachomatis (types L1, L2, & L3)]		Definitive diagnosis: Isolation of <i>C. trachomatis</i> from appropriate specimen and confirmation of LGV immunotype, although such laboratory capabilities are not widely available.	Fluctuant lymph nodes should be aspirated as needed. Incision and drainage or excision of nodes will delay healing and are contraindicated.	

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
<p>Pelvic inflammatory Disease (PID)</p> <p>Polymicrobial etiology: combinations of <i>N. gonorrhoea</i>, <i>C. trachomatis</i>, anaerobic bacteria, facultative gram-negative rods, <i>M. hominis</i>, and other microbial agents.</p>	<p>Spectrum of inflammatory disorders of upper genital tract of women. Many women have atypical or no symptoms. Symptoms include pain and tenderness of the lower abdomen, cervix, uterus, and adnexae. Other possible symptoms are elevated white blood cell count (WBC), dyspareunia, vaginal discharge, menometrorrhagia, dysuria, pain with menses, fever, chills and sometimes nausea and vomiting. Risk of PID increased by multiple sex partners, history of PID, or recent insertion of intrauterine device (IUD). PID can cause infertility, chronic pain, pelvic abscess, and ectopic pregnancy.</p>	<p>Presumptive diagnosis: By typical clinical symptoms if other serious conditions, such as acute appendicitis or ectopic pregnancy, can be excluded. Diagnosis often based on imprecise clinical findings.</p> <p>Definitive diagnosis: Through direct visualization of inflamed (edema, hyperemia, or tubal exudate) fallopian tube(s) during laparoscopy or laparotomy. Cultures of tubal exudate may be helpful.</p>	<p>Because the causative organisms are usually unknown at the start therapy, use regimens effective against a broad range of pathogens.</p> <p>Inpatient therapy: Recommended regimens: 1. Ceftriaxone 500 mg IM once daily PLUS Doxycycline 100 mg PO or IV twice a day OR Tetracycline 500 mg PO 4 times a day PLUS Metronidazole 400-500 mg PO OR IV twice a day or Chloramphenicol 500 mg PO or IV 4 times a day. 2. Clindamycin 900 mg IV 8 hourly PLUS Gentamicin 1.5 mg/kg IV 8 hourly. 3. Ciprofloxacin 500 mg PO twice a day OR Spectinomycin 1 gm IM 4 times a day PLUS Doxycycline 100 mg PO or IV 2 times a day OR Tetracycline 500 mg 4 times a day PLUS Metronidazole 400-500 mg PO or IV twice a day OR chloramphenicol 500 mg PO or IV 4 times a day.</p>	<p>Refer sex partner(s) for evaluation and treatment. Many sex partners are infected but asymptomatic. Avoid sexual activity until you and your partner(s) are cured. Understand how to take any prescribed oral medications. Use condoms to prevent future infections.</p>

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
Pelvic Inflammatory Disease (PID) (Continued)			<p>Duration of therapy should be at least 2 days after the patient has improved. This treatment should be followed by either doxycycline 100 mg PO twice a day OR tetracycline 500 mg PO 4 times a day, both for 14 days.</p> <p>Ambulatory therapy: Recommended regimens: Single dose therapy for uncomplicated gonorrhoea (e.g., ceftriaxone) PLUS Doxycycline 100 mg PO twice a day for 14 days OR Ofloxacin, 400 mg, PO, twice a day for 14 days PLUS Metronidazole, 500 mg PO, twice a day for 14 days.</p> <p>Alternative regimens (in absence of single dose gonorrhoea therapy) Trimethoprim (80 mg)/ sulphamethoxazole (400 mg) 10 tablets PO once a day for 3 days and then 2 tablets twice a day for 10 days PLUS Doxycycline 100 mg PO twice daily or Tetracycline 500 mg PO 4 times a day for 14 days PLUS Metronidazole 400-500 mg PO, twice a day for 14 days.</p>	

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
Syphilis (<i>Treponema pallidum</i>)	<p>Primary stage: Classical symptom is a chancre (indurated painless ulcer) at the site of exposure (e.g., vulva, cervix, penis, mouth, or anus). Internal lesions in women may not be detected. Lesion heals within a few weeks, without treatment. Symptoms appear 10-90 days after infection. Differential diagnosis for all genital lesions should include syphilis.</p> <p>Secondary stage: If primary stage untreated, symptoms will appear in a few weeks, including a highly variable skin rash (especially on palms of hands and soles of feet), general lymph node enlargement, condyloma lata, hair loss, and fever and malaise. Symptoms last several weeks to months and will disappear even without treatment.</p> <p>Latent: No clinical signs of infection. Early syphilis (infectious) defined as primary, secondary, or latent syphilis of less than 2 years duration. Late syphilis defined as latent syphilis of more than 2 years duration or syphilis of unknown duration. Syphilis infection can cause congenital syphilis and late syphilis (including neurosyphilis, cardiovascular syphilis, and localized gumma formation.)</p>	<p>Presumptive diagnosis: Primary stage: By identification of typical lesion(s) and either (1) a positive darkfield exam; (2) fluorescent antibody techniques in material from a chancre, regional lymph node, or other lesion; (3) the presence of a serologic test for syphilis (STS) titer at least 4-fold greater than the last; or patient's exposure to syphilis within 90 days of lesion onset.</p> <p>Secondary stage: Diagnosis through typical clinical presentation of symptoms and a strongly reactive STS. Condyloma lata will be darkfield positive.</p> <p>Latent stage: Periods of infection with strongly reactive STS, but no clinical signs of infection.</p> <p>Definitive diagnosis: Through identification of <i>T. pallidum</i> with darkfield microscopy or fluorescent antibody technique, for primary and secondary syphilis. No definitive diagnosis for latent syphilis.</p>	<p>Early syphilis (primary, secondary, or latent syphilis of not more than 2 years duration): Recommended regimen: Benzathine penicillin G 2.4 million units IM once (often given as two injections at separate sites).</p> <p>Alternative regimen: Aqueous procaine penicillin G 1.2 million units IM daily for 10 consecutive days.</p> <p>Late latent and late benign syphilis (latent syphilis of indeterminate length or of more than 2 years duration) Recommended regimen: Benzathine penicillin G 7.2 million units total, administered as 2.4 million units IM given 1 week apart for 3 consecutive weeks.</p> <p>Alternative regimen: Aqueous procaine penicillin G 1.2 million units IM daily for 20 consecutive days.</p> <p>Neurosyphilis Recommended regimen: Aqueous crystalline penicillin G 12-24 million units total, administered as 2-4 million units every 4 hours IV, for 14 days.</p>	<p>Obtain testing for HIV infection because genital ulcers may facilitate HIV infection. Return for follow-up serologies. Understand how to take any prescribed oral medications. Avoid sexual activity until you and your partner(s) are cured. Use condoms to prevent future infections.</p>

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
Syphilis (Continued)	Excessive, frothy, green or yellow vaginal discharge, with foul odor. Itching, erythema, edema, pain on urination, and pain on intercourse also may occur. Some women may have no symptoms. Men are usually without symptoms, but may have urethritis, balanitis, cutaneous lesions on penis, pain on urination, and itching. Recurrent infections are common.	Diagnosis when a vaginal culture or fluorescent antibody is positive for T. vaginalis OR typical motile trichomonads are identified in a saline wet mount of vaginal discharge. Trichomonads found by Pap smear are not diagnostic of active infection.	<p>Alternative regimen: Aqueous procaine penicillin G 1.2 million units IM daily, AND probenecid 500 mg PO 4 times a day, both for 10-14 days.</p> <p>Penicillin-allergic patients: Doxycycline 100 mg PO 2 times a day for 14 days (if early syphilis) or for 28 days (if late syphilis).</p> <p>Penicillin-allergic pregnant women: Erythromycin 500 mg PO 4 times a day for 14 days.</p>	Understand how to take or use any prescribed medications. Use condoms to prevent future infections. Avoid drinking alcohol until 24 hours after completing metronidazole therapy. Both asymptomatic and symptomatic male partners should be treated.
Trichomoniasis (Trichomonas vaginalis)	Excessive, frothy, green or yellow vaginal discharge, with foul odor. Itching, erythema, edema, pain on urination, and pain on intercourse also may occur. Some women may have no symptoms. Men are usually without symptoms, but may have urethritis, balanitis, cutaneous lesions on penis, pain on urination, and itching. Recurrent infections are common.	Diagnosis when a vaginal culture or fluorescent antibody is positive for T. vaginalis OR typical motile trichomonads are identified in a saline wet mount of vaginal discharge. Trichomonads found by Pap smear are not diagnostic of active infection.	<p>Recommended regimen: Metronidazole 2 g PO once.</p> <p>Alternative regimen: Metronidazole 400-500 mg PO twice a day for 7 days.</p> <p>Metronidazole is contraindicated in the first trimester of pregnancy but may be used during the second and third trimesters. There is no evidence that other 5-nitroimidazoles are superior to metronidazole, but they may be used when dictated by availability. Asymptomatic women should be treated with the same regimen as symptomatic women.</p>	Understand how to take or use any prescribed medications. Use condoms to prevent future infections. Avoid drinking alcohol until 24 hours after completing metronidazole therapy. Both asymptomatic and symptomatic male partners should be treated.

Table 6:1 Overview for clinical management of some common sexually transmitted infections (Continued)

Disease (pathogen)	Symptoms	Diagnosis	Treatment	Patient instructions
<p>Vulvovaginal candidiasis (<i>Candida albicans</i>)</p>	<p>Candida are normal flora of skin and vagina and not considered sexually transmitted infections. Clinical presentation varies from no signs or symptoms to itching, irritation, or pain of the external genitalia. Type of symptoms does not distinguish microbial etiology. Men may develop urethritis, balanitis, or cutaneous penile lesions. Recurrent infections are common. Persistent candidiasis may indicate HIV.</p>	<p>Presumptive diagnosis: By typical clinical symptoms of vulvovaginitis and microscopic identification of yeast forms or hyphae in Gram stain or KOH wet-mount preparations of vaginal discharge.</p> <p>Definitive diagnosis: By positive culture for <i>C. albicans</i> (or other <i>Candida</i> species) in symptomatic women. Cultures may detect clinically insignificant infections (should not be treated) and are not recommended.</p>	<p>Recommended regimens: Miconazole or clotrimazole, 200 mg intravaginally daily for 3 days OR Clotrimazole 500 mg intravaginally once, OR Nystatin 100,000 units intravaginally daily for 14 days.</p>	<p>Understand how to take or use any prescribed medications. Wear a sanitary pad to protect clothing, and change pads frequently. Continue taking medicine even during menses.</p>

TRENDS OF SEXUALLY TRANSMITTED INFECTIONS

At least 333 million new cases of curable STIs occurred worldwide in 1995. There were 170 million new cases of trichomoniasis, 89 million of chlamydia, 62 million of gonorrhea, and 12 million of syphilis.³⁸

Because routine surveillance for STIs is rarely conducted in Africa, little is known about the epidemiology of STIs on the continent. Most data on STIs originate from small studies of selected populations, typically asymptomatic pregnant women.^{11,30} These studies indicate that STI rates are high in most parts of Africa. For example:

- In a review of several studies of family planning and prenatal clinic attendees, each of three STIs—gonorrhea, chlamydia, and syphilis—infected, on average, 10% of persons tested.³⁷
- In a hospital-based study in Nairobi, Kenya, nearly one in four adolescent women attending a prenatal clinic was diagnosed with gonorrhea, chlamydia, or herpes.²²
- In a study of prenatal clinic attendees in Cameroon, 15% of women were diagnosed with gonorrhea, and 21% were diagnosed with trichomoniasis.²⁷
- In a Mozambique study, as many as 10% to 15% of primary health care clinic visits were for treatment of STIs.¹

Overall STI rates are believed to be highest in sub-Saharan Africa and lowest in North Africa. STIs are also common in areas of Central and East Africa. Rates of STI are moderate in most areas of West Africa but high in Cote d'Ivoire. Patterns of transmission may vary widely across the continent.³¹

Gonorrhea is probably the most common bacterial STI in Africa.^{21,31} Rates of chlamydia infection are likely to be comparable to rates of gonorrhea, but little is known about the prevalence and incidence of chlamydia.⁴ Chancroid is increasingly common among commercial sex workers in Africa and is important because of its apparent ability to facilitate HIV infection.¹¹ Although less common than chancroid in most areas, syphilis may cause severe reproductive health problems.⁴ Ulcerative STIs caused by genital herpes, chancroid,

donovanosis, and lymphogranuloma venereum infections may together account for nearly 50% of all diagnosed STIs in Africa.³¹

The same sexual behaviors may result in different STIs in various areas of Africa, depending on which infection is most prevalent.²³ For example, the prevalence of genital ulcer disease is high in many parts of East, Central, and Southern Africa.²⁸ In East Africa, 50% to 70% of genital ulcers are due to chancroid.³² Similarly, in sub-Saharan Africa, the majority of genital ulcer disease is caused by chancroid.^{11,21} However, in West Africa, genital ulcers are much less common and are usually caused by genital herpes or syphilis, not chancroid.²¹ When symptoms and signs may be due to any of several STIs, a presumptive diagnosis can often be based on the local epidemiologic profile of STIs. For example, if a patient's symptoms and signs are indistinguishable between syphilis and chancroid, and treatment for both infections is not feasible, the clinician may treat for the more prevalent STI and provide adequate follow-up to verify cure.²⁰

COMPLICATIONS OF SEXUALLY TRANSMITTED INFECTIONS

Complications from STIs are more severe and more common among women than men:

Pelvic inflammatory disease is a potentially life-threatening condition that results from complications of *N. gonorrhoea* and *C. trachomatis* infections. PID increases the risk of tubal infertility, ectopic pregnancy, and chronic abdominal pain.¹¹ In many African hospitals, PID is the most frequent reason for admission to gynecological wards, accounting for up to 40% of admissions.²⁵

Tubal infertility is associated with PID and results from inflammation and scarring of the fallopian tubes following ascent of infection into the upper reproductive tract.³⁶ Tubal occlusion prevents the egg from passing through the fallopian tubes. Nearly 75% of infertility in Africa is related to gonorrhea or chlamydia infections that have extended into the upper reproductive tract.^{4,7}

Ectopic (tubal) pregnancy is a potentially fatal condition that results when a fertilized egg implants outside the uterus, usually in the fallopian tubes. Ectopic pregnancy occurs when an ascending infection in the reproductive tract partially blocks tubal passages. In one Kenyan hospital, ectopic pregnancy was the most common reason for emergency surgical admission.³⁷

Genital cancers are potentially fatal diseases that have been associated with STIs. HPV, which causes genital warts, is associated with the development of cervical neoplasia.^{33,37}

Chronic pain may be experienced by patients with STIs such as genital herpes and PID, which may cause persistent or episodic genital or abdominal pain.

FACTORS AFFECTING RISK

Family planning professionals should be aware of factors that affect the risk of transmitting or acquiring STIs.

- **The risk for STIs differs from the risk for unintended pregnancy during sexual intercourse.** The risk of pregnancy per act of intercourse ranges from 0% to 20%, varying with menstrual cycle stage. The risk of STI transmission exists during *any* act of unprotected intercourse with an infected partner. The exact risk per coital episode depends on the transmissibility of the particular STI and the sex of the infected person. For example, the risk of acquiring gonorrhea from a single act of intercourse with an infected partner is approximately 25% for men and 50% for women.⁶
- **STIs cause more severe, long-term complications in women than in men.** The increased severity of complications from STIs among women results from several factors. First, asymptomatic infection is much more common in women than in men, resulting in delayed diagnosis and treatment at more advanced stages of disease. Additionally, the diagnosis of STIs is more difficult because of physiological differences. When present, infection is

more likely to ascend into the reproductive tract of women than of men. Finally, the fluid dynamics of intercourse make STIs more easily transmitted to women from a single sexual encounter.

- **STIs facilitate the transmission of HIV.** An interactive relationship exists between STIs and the sexual transmission or acquisition of HIV.³⁶ Ulcerative STIs (such as chancroid, syphilis, and genital herpes) may facilitate HIV transmission by acting as a port of entry for infection.^{4,31,33} The high prevalence of ulcerative STIs may partially explain corresponding high rates of HIV transmission, especially in sub-Saharan Africa.²⁴ One Kenyan study estimated that 75% to 98% of HIV infections were attributable to genital ulcer disease.¹⁴ Non-ulcerative STIs (such as chlamydia, gonorrhea, and trichomoniasis) also may facilitate HIV transmission by increasing the number of target cells that can be infected.

In addition, the presence of HIV affects the natural history of many STIs and their response to antimicrobial therapy.^{31,37} The immune dysfunction caused by HIV may make ulcerative symptoms more persistent and more invasive by affecting the clinical course of infection. In Kenya, the failure rate of single-dose therapy for chancroid increased following a rapid rise in concurrent HIV infection.³⁴ HIV immunosuppression may also increase the severity of other viral infections such as HSV-2, HBV, and HPV.^{4,31}

Concurrent HIV infection should be considered among clients with STIs. Similarly, clients with HIV infection should be evaluated for other STIs. In Tanzania, community-based programs emphasizing syndromic treatment of STIs resulted in a significant decrease in HIV incidence.¹²

- **The type of sexual activity affects the risk of acquiring STIs.** Some types of sexual activity may increase exposure to infectious STI pathogens through irritation, inflammation, or tearing of delicate mucosal surfaces. In some African cultures, women insert drying agents and astringents such as leaves, herbs, and powders into the vagina prior to intercourse. However, intravagi-

nal drying substances may lead to inflammatory reactions or abrasions of the vaginal surfaces and may facilitate STI and HIV transmission.² Other types of "dry sex," such as intercourse with minimal or no foreplay, may pose similar risk. Additionally, anal intercourse increases the risk of mucosal tearing. Couples should use condoms during this activity.

- **Certain population groups may be at increased risk for STI.** In general, rates of STI tend to be higher in men, residents of urban areas, unmarried persons, and young adults.⁴ Certain subsets of the population, such as commercial sex workers, their male clients, long-distance truck drivers, and members of the military (and their sexual partners) often have the highest rates of STI because they have a number of different sex partners.³⁷ These population groups are defined as "core transmitters" of infection because their behaviors sustain continuing high levels of STI within a community.³ The purpose of identifying core groups with high rates of STI is to find ways to reach those with both the greatest need for preventive services and the greatest tendency to transmit STI to others.

SEXUALLY TRANSMITTED INFECTIONS IN PREGNANCY

Transmission of STIs to the fetus may occur during pregnancy through placental transfer or during birth through contact with STI microorganisms. Many STI pathogens can be vertically transmitted to the fetus, including *T. pallidum*, *C. trachomatis*, *N. gonorrhoea*, HBV, HSV-2, HPV, and HIV. (See Table 6:2.) Some of these microorganisms can be fatal or severely debilitating to the fetus and result in spontaneous abortion, stillbirth, prematurity, low birthweight, and neonatal death, or cause severe illness such as pneumonia, meningitis, blindness, or respiratory tract disease.⁵ (See Table 6:2.) One study found that congenital syphilis was the fourth leading cause of perinatal mortality in Ethiopia;²⁶ another estimated that congenital syphilis was responsible for 30% of perinatal deaths fruitin Zambia.¹⁵ In Kenya, the risks of gonococcal ophthalmia and chlamydial ophthalmia for infants born to infected mothers were estimated to be 42% and 37%, respectively.³⁴

Worldwide, mother-to-infant transmission accounts for a high percentage of HIV infections among children.⁹ Approximately 23% to 42% of infants born to HIV-infected mothers will develop HIV infection themselves.¹⁹ In Africa, vertical transmission of infection to newborns is important because so many women of reproductive age are HIV-infected.³¹

Table 6:2 Role of sexually transmitted organisms in pregnancy and childbirth

Organism	Maternal Infection Rate (%)¹	Infant Effects	Risk from Infected Mother	Prevention	Treatment of Neonate
<i>Neisseria gonorrhoeae</i>	1-30	Conjunctivitis, sepsis, meningitis	About 30%	Screening; culture mother; apply ocular prophylaxis	Ceftriaxone
<i>Chlamydia trachomatis</i>	2-25	Conjunctivitis, pneumonia, bronchiolitis, otitis media	25-50% conjunctivitis 5-15% pneumonia	Screening in third trimester; culture mother; apply ocular prophylaxis	Erythromycin
<i>Treponema pallidum</i>	0.01-15	Congenital syphilis, neonatal death	50%	Serologic screening in early and late pregnancy	Penicillin
Hepatitis B virus	1-10	Hepatitis, cirrhosis	10-90%	Active HBV immunization	Post-exposure passive HBV immunization
Herpes simplex virus	1-30	Disseminated, central nervous system, localized lesions	3% recurrent at delivery, 30% primary at delivery	Cesarean delivery if lesions present at delivery	Vidarabine, Acyclovir
Human papilloma virus	10-35	Laryngeal papillomatosis	Rare	None	Surgical
Human immunodeficiency virus	0.01-20	Pediatric AIDS	22-39%	Pregnancy prevention	Zidovudine

¹Percent of pregnant women with evidence of infection.

Source: Cates (1995)

Because an STI may greatly harm a fetus, clinicians should routinely consider whether pregnant women may be infected with STIs that may be harmful to the fetus, including syphilis, gonorrhea, chlamydia, and HIV. Where available, prenatal screening for syphilis has been shown to be cost effective for preventing reproductive morbidity.¹⁶ Pregnant women with curable STIs should be treated. Drugs that may harm the fetus, such as the tetracyclines, should be restricted; however, metronidazole can be safely prescribed after the first 3 months of pregnancy. Additionally, the use of 1% silver nitrate solution or 1% tetracycline ointment dramatically reduces the transmission of gonococcal and chlamydial ophthalmia to the neonate.³⁴

DIAGNOSIS AND TREATMENT

Diagnosing and treating STIs are often perceived to be too costly and too advanced for many developing countries. Actually, the direct costs associated with diagnosing and treating uncomplicated reproductive tract infections are substantially lower than the costs of managing complications from the infection.³⁷ STI control has been shown to be highly cost effective in many developing countries in terms of dollars spent per number of healthy years of life saved.¹³

In Africa, it is usually not possible to diagnose the infecting organism because most clinics lack the capacity, resources, training, or laboratory support to comprehensively examine clients for STIs. Cultures or other diagnostic tests are rarely available. Even when tests are conducted, results may not be available for 1 to 7 days, requiring clients to return to the clinic to obtain test results and treatment.³⁹ Even if they are infected, some clients may be unable or unwilling to return to the clinic because of financial and transportation barriers.

In the absence of laboratory tests, clinicians have begun managing STIs by using a syndromic approach—identifying groups of symptoms and signs of infection without laboratory tests and treating for all possible infections with drugs of proven local efficacy. Syndromic diagnosis can be implemented with minimal economic input and is currently practiced in primary health centers in several countries,

including Botswana, Nigeria, Tanzania, and Zimbabwe.²⁰ In many parts of East, Central, and Southern Africa, clinicians diagnose genital ulcer disease without laboratory facilities and rapid diagnostic tests.²⁸

WHO has developed simplified guidelines for STI syndromic management. (See Figures 6:1, 6:2, 6:3, and 6:4.) These flow charts outline actions for managing symptoms and signs of genital ulcer, urethral discharge, vaginal discharge, and lower abdominal pain in the client. Because clients may present with two or more concurrent STDs (e.g., coexisting gonorrhea and chlamydia), clinicians should treat clients for *all* the listed STIs that may possibly cause the indicated symptoms and signs. When possible, clinicians also should conduct a genital examination to confirm signs before diagnosing STIs with the algorithms.²⁰ The algorithms are intended for use when no laboratory is available:

Example 1: *A client reports the recent onset of a genital ulcer or lesion with pain. The exam reveals a single, non-recurrent, open sore in the patient's genital area. Without further information, treat the patient for both syphilis and chancroid infections and follow up appropriately.*³⁹

Example 2: *A client complains of vaginal discharge. The patient is determined to be at risk for STI under the WHO-recommended risk assessment. In the absence of diagnostic tests, treat the patient for both cervicitis and vaginitis. (*At risk: the patient has a symptomatic partner or meets any two of the following criteria: age under 21; single; more than 1 sex partner; new sex partner in past 3 months.)*³⁹

Figure 6:1a Flow Chart for Urethral Discharge

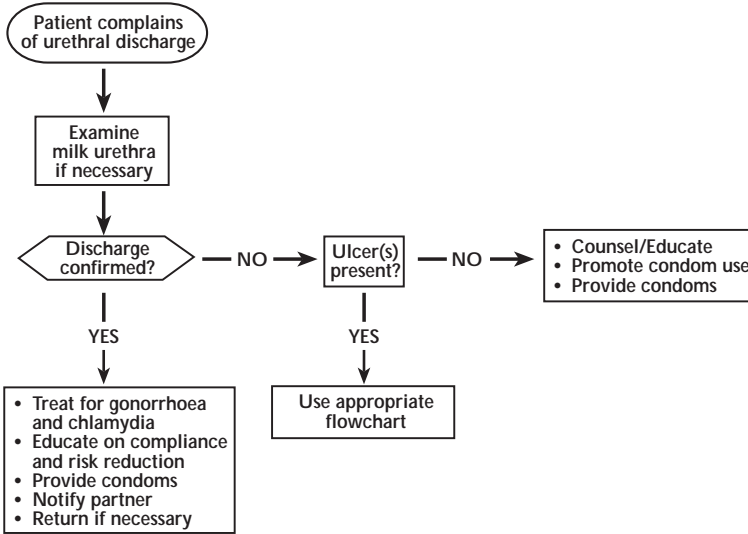
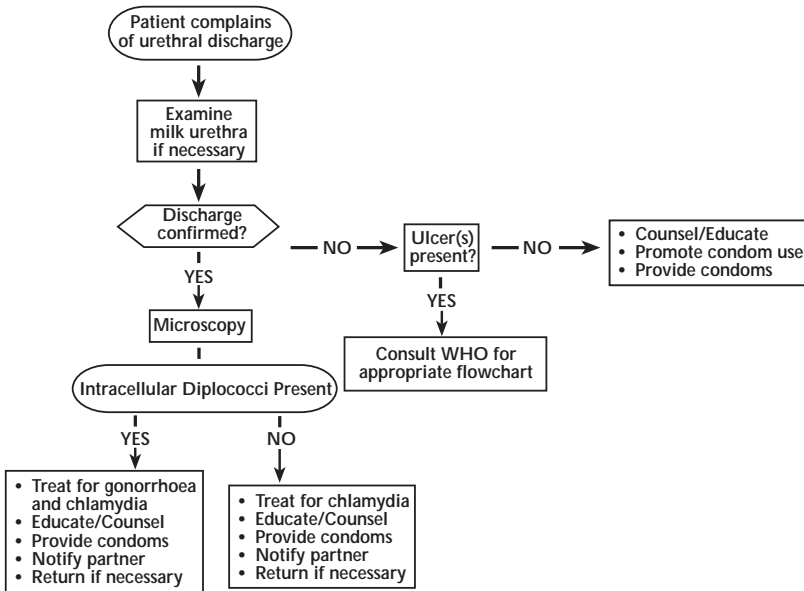
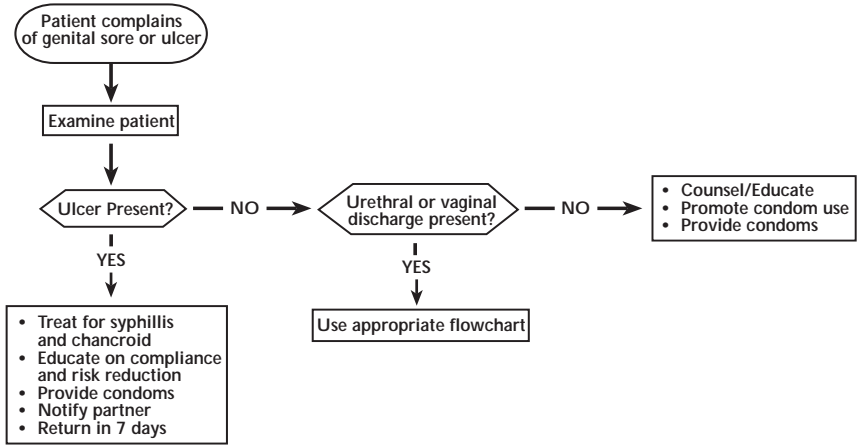


Figure 6:1b Flow Chart for Urethral Discharge with Microscope



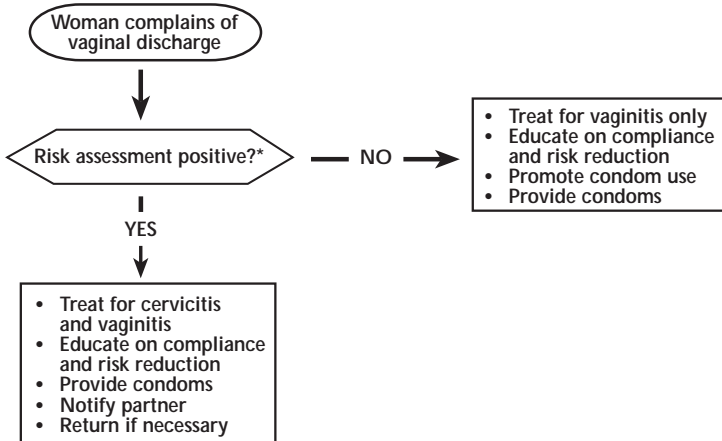
Source: WHO, 1993

Figure 6:2 Flow Chart for Genital Ulcers



Source: WHO, 1993

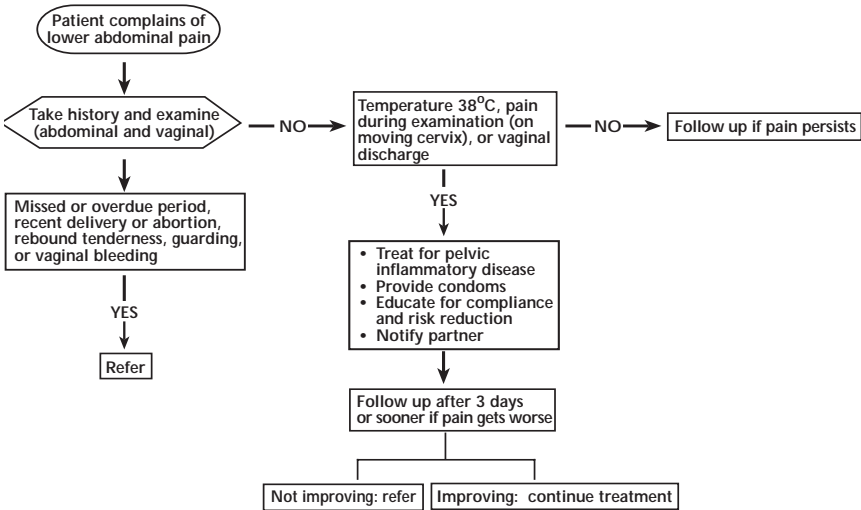
Figure 6:3 Flow Chart for Vaginal Discharge



*Positive = partner symptomatic or any two of the following: age <21; single; >1 partner; new partner in past 3 months.

Source: WHO, 1993

Figure 6:4 Flow Chart for Lower Abdominal Pain



Source: WHO, 1993

The availability, cost, and efficacy of antimicrobial therapies vary widely within Africa. Many drugs are expensive. Furthermore, there has been an increase in the number of strains resistant to standard treatments, especially treatments for gonorrhea and chancroid infections^{4,11,31} Consequently, WHO has recommended several possible treatment regimens for each STI. (See Table 6:1.) Clinicians should use the most effective treatment available to them. WHO recommends that drugs used for treatment of STIs in all health care facilities should be at least 95% effective to reduce the risk of developing resistant strains of infection.³⁹ If WHO-recommended drugs are unavailable, providers should use drugs recommended on their National List of Essential Drugs or by their National Sexually Transmitted Disease Program.²⁰ The criteria for selecting STI drugs are as follows:

- High efficacy
- Low cost
- Acceptable toxicity and tolerance
- Organism resistance is either unlikely to develop or will be delayed

- Single dose
- Oral administration
- Not contraindicated for pregnant or lactating women

Drugs should be prescribed in recommended doses to ensure full cure and to prevent multiple drug resistance to infection. When possible, provide short-term or single-dose therapy instead of multi-dose therapy. Doing so will eliminate the need for patient compliance and minimize the chance that resistant strains will develop in the population. If limited resources prohibit you from treating all possible STIs, treat for the STI most prevalent in the area. Also counsel clients on the importance of preventing reinfection. In all listed algorithms (except for vaginitis), sex partners should be treated for the same conditions as the index case.³⁹ Efficient case management of STIs has several key principles:

- Correct diagnosis
- Effective treatment
- Education on risk reduction and prevention
- Promotion and provision of condoms
- Partner notification and treatment
- Clinical follow-up where appropriate

The accuracy and efficiency of syndromic management are being evaluated. WHO reports indicate that syndromic management for urethral discharge in men and genital ulcers in men and women is valid, feasible, and cost effective.³⁹ Symptomatic case management for women with and without symptoms and signs of vaginal discharge is being studied. Although less accurate than laboratory diagnosis, syndromic management permits diagnosis and treatment of clients during a single visit and requires minimal resources. Symptomatic clients may be diagnosed and treated earlier. Early treatment decreases the duration of infectivity and reduces the likelihood of serious complications from STIs. Unfortunately, many STIs are often subclinical—especially in women—and cannot be detected without laboratory confirmation.³⁷ Clients without symptoms and signs of infection may be missed by syndromic diagnosis. Conversely, presumptive treatment for all possible STIs expends valuable resources through “over treatment.”

Because patterns of disease, availability of resources, and levels of drug resistance among STI pathogens may vary across clinics and regions, the WHO algorithms should be viewed only as guidelines and should be adapted to the needs of the population. The guidelines should not replace clinical judgment. The algorithms in this chapter have been developed specifically for clinics without laboratories, microscopes, specula, etc. Clinics with laboratory capability should consider using other algorithms.

PARTNER NOTIFICATION

The timely referral and treatment of sex partners of infected clients prevent both a reinfection of the original patient and a further spread of STIs throughout the community. Outreach and community-based workers can notify exposed sex partners, although this process is labor intensive and often impractical. Educating the index patient to bring her sex partner(s) to the clinic for evaluation is probably more cost effective.¹³ In Ibadan, after a program was implemented to explain symptoms and signs of STIs and modes of transmission, referral rates among the sex partners of infected clients increased considerably.¹⁷

Equally important, referral of sex partners helps to identify persons with an asymptomatic STI, who would not otherwise know they are infected. Because men are more likely than women to be symptomatic and to seek early treatment, notifying and treating their exposed female partners is a useful way to identify women with an asymptomatic STI.³⁷ Family planning programs should coordinate with STI programs to ensure that partners of infected clients are evaluated and treated when infected.

INTEGRATING PREVENTION SERVICES

When STI-related services can be offered in the family planning clinic, clients are not required to make separate visits to the STI clinic or other primary health center for care.^{10,20} In addition, family planning programs that routinely screen for STIs can identify women with

asymptomatic disease who may be at increased risk for complications from infection.²⁰ Family planning clinics lacking the resources to diagnose and treat women with STIs can refer clients to appropriate higher level care. Thus, clinicians in family planning should be familiar with their local STI program and primary care centers.

The family planning visit also provides an excellent opportunity to educate clients about modes of STI transmission and prevention of future infection. Ensure the client understands how to take any prescribed medication for infection. Use language that the client understands, and encourage the client to ask questions. Strategies employed to reduce incident STIs, such as regular condom use, may also reduce HIV infection.

Services for diagnosis and treatment of STIs should be widely available, highly accessible, and affordable. Some family planning clinics have already extended their range of services to include evaluation, diagnosis, treatment, and counseling for STIs. The Gambia Family Planning Association, for example, treats women with candidiasis and trichomoniasis infections but refers women with other STIs to government clinics.²⁰

SEXUALLY TRANSMITTED INFECTIONS AND CONTRACEPTION

Family planning providers can minimize their clients' risk of STIs by supplying them with contraceptives that protect against both pregnancy and infection and encouraging their use.⁸ Contraceptives vary in the amount of protection they provide against STI pathogens. (See Table 6:3.) Condoms are highly effective in protecting against both bacterial and viral STIs, including HIV, and should be used for barrier protection against STIs, regardless of whether other contraceptives are also used. Vaginal spermicides such as films, gels, and suppositories, when used alone, can help prevent infection with bacterial STIs such as cervical gonorrhea and chlamydia, but their protective role against HIV and other viral infections is uncertain. Other contraceptives, such as the diaphragm, protect against cervical infections but provide

insufficient protection from other STIs, such as HIV, that may infect women through the vulva or the vagina. Hormonal contraceptives, which provide the most protection against pregnancy, are associated with reduced risks of symptomatic PID but offer no protection against lower genital tract bacterial or viral STIs. Clinicians providing any contraceptive method should counsel clients about STIs and infertility and encourage condom use.

Table 6:3 Effects of contraceptives on bacterial and viral STIs

Contraceptive Method	Bacterial STI	Viral STI
Condom	Protective against all	Protective
Spermicide	Protective against cervical gonorrhea and chlamydia	Undetermined <i>in vivo</i>
Diaphragm	Protective against cervical infection, associated with vaginal anaerobic overgrowth	Protective against cervical infection
Hormonal	Associated with increased cervical chlamydia, protective against symptomatic pelvic inflammatory disease (PID)	Not protective
Intrauterine device	Associated with PID in first month after insertion	Not protective
Natural family planning	Not protective	Not protective

Source: Cates and Stone, 1992

GUIDELINES FOR MANAGING PATIENTS

Family planning providers should consider the following guidelines when managing clients with STIs.

ASSESS FOR MULTIPLE STIS

Treat for all possible STIs that might cause the symptoms and signs of infection. Coexisting infections are common, especially gonorrhea and chlamydia.³⁹ Test for HIV infection among clients with STIs when possible.

PRESCRIBE RECOMMENDED DRUGS AND DOSES

Although signs may appear to improve with lower doses of medication, the infection may not be completely cured and, in some cases, will become resistant to treatment. Multiple resistance to antibiotics is common for gonococcal and chancroid infections in many African countries and often requires more difficult and expensive treatment.^{11,31} In the case of drug resistant infection or other treatment failure, prescribe an alternative recommended therapy and provide follow-up. The increased cost of new, non-resistant drugs should be weighed against the costs of inadequate therapy (such as reinfection, complications from infection, further spread of infection within the community, and multiple drug resistance).

COMPLETE ALL MEDICATION

Encourage clients to complete all prescribed medication, even if symptoms subside. Occasionally, the symptoms may disappear without treatment; however, their disappearance does not indicate cure—more severe infection can follow. Discuss with the patient what disease she or he has, how it is transmitted, why it must be treated, and when and how to take prescribed medication.

PREPARE CLIENTS FOR SIDE EFFECTS OF TREATMENT

Some drugs, such as erythromycin, may cause nausea. Recommend the patient take the medication after meals to reduce nausea. Again, stress the importance of completing the full dose of the medication for the prescribed length of time.

TREAT SEX PARTNERS

Interrupting the chain of transmission is crucial to STI control. For curable STIs, further transmission and reinfection can be prevented by referral and treatment of sex partners.

RECOMMEND ABSTINENCE DURING TREATMENT

Encourage clients to avoid sexual intercourse or to use condoms until their medication is finished and their symptoms and signs of infection have disappeared.

PROVIDE ENOUGH CONDOMS.

Provide condoms to all clients and counsel them on the importance of preventing reinfection and infertility, especially if a woman wishes to bear children. Condom use will minimize contact with infectious ulcers and discharges and will help to prevent HIV infection.

PROVIDE COUNSELING AND FOLLOW-UP TO CLIENTS

Advise clients to return to the clinic if symptoms do not subside. Counsel clients to seek health care as soon as possible if they suspect they may have an STI. Teach clients how to recognize symptoms of infection, but emphasize that many STIs are asymptomatic, especially in women.

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Infertility

*Children are the cloth of the body.
Without children you are naked.*

—Yoruba Saying (Nigeria)

Fertility is important to all societies. The inability to have children has traditionally been a source of pain, anxiety, and shame. The more important children are to the fabric of a given culture, the more important it is for couples to be fertile, and the worse the consequences if a couple is infertile. Couples who are unable to bear as many children as they wish may feel anguish or emotional pain. Several reports have focused on the causes, prevention, and treatment of infertility in Africa.^{4,6,10,11,13,30,45,53}

In most of Africa, a man's wealth is measured, in part, by the number of children he has. Children are important as farm workers and as a source of support in old age for their parents. Male children also play an important role in certain ethnic groups where, for example, a grandchild is the only person who can replace his departed grandfather, particularly with respect to the practice of certain rituals. Similarly, a wife's value to her husband may be determined by her ability to bear healthy children. A wife may be deserted or divorced summarily for her inability to bear children, even if the husband is the one who is infertile.

Many African doctors are becoming convinced that infertility is a problem that deserves attention in family planning programs. Family planning providers must recommend only safe, effective means of delaying or spacing children that will not impair future fertility. Sexually transmitted infections (STIs) are the leading cause of preventable infertility. (See Chapter 6 on Sexually Transmitted Infections.) Other infectious diseases, poor nutrition, and limited access to adequate health care for abortion and childbirth are also important factors in reducing fertility. If family planners are to serve the needs of general reproductive health care in their community, they should provide some degree of initial evaluation and counseling for infertility. This problem not only concerns the woman, but also the couple.

In this chapter, the term "infertility" is used to mean either a woman's inability to conceive and bear a living child or a man's inability to impregnate a woman. The following definitions are adapted from the World Health Organization's (WHO's) definitions of infertility in a couple:

- **Primary infertility.** The couple has never conceived despite unprotected intercourse for at least 12 months.
- **Secondary infertility.** The couple has previously conceived but is subsequently unable to conceive within 12 months, despite unprotected intercourse.
- **Pregnancy wastage.** The woman is able to conceive but unable to produce a live birth (unable to carry the fetus to a viable age).
- **Subfertility.** The couple has difficulty in conceiving jointly because both partners may have reduced fecundity. In this sense, "subfertility" is used interchangeably with the term "subfecundity."

EPIDEMIOLOGY OF INFERTILITY IN AFRICA

There is a recognized belt of subfertility and infertility in Africa extending from the West African countries of Senegal, Mali, Burkina Faso, Niger, and northern Nigeria through Cameroon, Gabon, Congo,

Central African Republic, Zaire, Zambia, and southwest Sudan, to the East African countries of Uganda, southwestern Kenya, Ethiopia and Tanzania.^{1,14,45} Infertility also exists in other parts of Africa, but the prevalence is lower. In the South, Lesotho has a high proportion of subfecundity (37% of all currently married women).⁴⁸ The "infertility belt" corresponds quite well with the acquired immune deficiency syndrome (AIDS) belt. Both infertility and AIDS are associated with STIs.

REQUIREMENTS FOR FERTILITY

The properties of the fecund male include:

- Normal spermatogenesis and ductal system (sperm count, motility, and biologic structure and function)
- Functioning reproductive anatomy and physiology:
 - Adequate sexual drive
 - Ability to maintain an erection
 - Ability to have sexual intercourse
 - Ability to have normal ejaculation into the vagina

The properties of the fecund female include:

- Functioning reproductive anatomy and physiology:
 - Adequate sexual drive
 - A vagina capable of receiving spermatozoa
 - Normal cervical mucus to allow sperm to pass to the upper genital tract
 - Ovulatory cycles
 - Patent fallopian tubes that permit the sperm and ovum to meet and allow the fertilized ovum to migrate to the uterus
 - A uterus capable of developing and sustaining the conceptus to maturity
 - Adequate hormonal status to maintain pregnancy

- Normal immunologic responses to accommodate sperm, fertilized ovum, and fetus
- Adequate nutritional, chemical, and health status to maintain nutrition and oxygenation of placenta and fetus

Psychological, anatomic, or physiological alterations can interfere with the occurrence of pregnancy. A large study by WHO suggests that male infertility is a causative factor for 43% of infertile couples in Africa and the sole cause for 8% of couples. Female infertility is the sole cause for 37% of infertile couples (see Table 7:1). The diagnoses of infertility are noted in Table 7:2.

Table 7:1 General categories of infertility (type and causation) in developing countries

Category	Percentage of couples			
	Africa (n=842)	Asia (n=1,992)	Latin America (n=1,228)	Developed Nations (n=3,904)
Type of fertility				
Primary	48	77	60	71
Secondary	52	23	40	29
Causation				
No cause found in either	5	13	10	14
Female causes only	37	37	25	31
Male causes only	8	8	22	22
Causes found in both	35	35	30	21
Became pregnant	15	15	13	12

Source: Cates et al. (1985), WHO (1986)

Table 7:2 Male and female diagnoses of infertility in developing countries

Diagnosis	Percentage of couples		
	Africa	Asia	Latin America
Female diagnosis			
No demonstrable cause	16	31	35
Bilateral tubal occlusion	49	14	15
Acquired tubal abnormalities	12	12	12
Anovulatory regular cycle	14	9	9
Anovulatory oligomenorrhea	3	7	9
Ovulatory oligomenorrhea	4	11	5
Hyperprolactinemia	5	7	8
Endometriosis	1	10	3
Male diagnosis			
No demonstrable cause	46	58	41
Accessory gland infection	11	3	12
Idiopathic low motility	1	5	8
Primary testicular failure	7	11	13
Varicocele	20	10	19

Source: WHO (1986)

In most developing countries, the major preventable causes of infertility are STIs, postpartum infection, and postabortion infection. Tubal occlusion and pelvic adhesions resulting from STIs and complications of pregnancy cause almost 75% of all female infertility in Africa (see Table 7:2).^{6,53} Most cases of infertility reported in Africa are due to secondary causes, possibly reflecting the higher rates of acquired infertility from postpartum infections and STIs.

FACTORS AFFECTING REPRODUCTIVE PERFORMANCE

Several factors are known or are strongly suspected to affect the probability of conception.

AGE OF WOMAN

A review of the Western literature demonstrated that the effects of age on fertility are moderate and do not begin until the woman is about 35 or older.²⁷ Older women take longer to conceive, but both clinicians and patients must carefully distinguish "waiting longer" from "never being able to conceive." Most "infertile" couples conceive eventually, whether or not they are treated. Table 7:3 shows the effects of age on fertility. The age of the woman is complicated by a host of other factors, including frequency of intercourse, age of the male partner, and the cumulative effect of medical and gynecological problems.

Table 7:3 Percentage of currently married women who are infecund, by age*

	Age							Total 25-49
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Kenya	1.8	5.1	8.7	15.8	26.2	37.4	63.8	24.8
Lesotho	1.3	5.7	14.8	24.5	39.7	61.2	83.1	37.3
Senegal	1.7	4.1	7.1	12.6	31.0	48.4	74.6	28.2
Sudan (North)	3.7	6.8	11.7	20.8	29.0	56.0	79.6	30.3

*A women was defined as infecund if she reported an inability to have a child, or if she had an interval of 5 or more years without a pregnancy while she was continuously married and not using contraception.

Source: Vaessen M (1984)

AGE OF MAN

The age of a man has a significant effect on coital frequency and sexual function, which directly influence the chance of pregnancy. However, the age of a man appears to have little effect on the ability of sperm to fertilize an ovum.

LACK OF UNDERSTANDING OF REPRODUCTIVE BIOLOGY

Another barrier to optimal fertility is a misunderstanding about timing and frequency of intercourse. For example, the cultural taboos that delay intercourse until after menses may prevent conception in some women with short cycles and long menstrual periods. Patient education is, therefore, of primary importance in fertility counseling and family planning.

COITAL FREQUENCY

Infrequent coitus is a common cause of low pregnancy rates.^{22,25} How frequently couples have intercourse directly affects pregnancy rates^{22,35} (see Table 7:4). Although the sperm count may be slightly decreased by frequent intercourse (once per day or once every other day), the motility and number of sperm in a normal man should still be sufficient to achieve a pregnancy.³²

Table 7:4 Frequency of intercourse and probability of conception within 6 months

Frequency of intercourse (per week)	Percent pregnant within 6 months
<1	17
1	32
2	46
3	51

Source: MacLeod and Gold (1953)

TIMING OF INTERCOURSE

Having intercourse prior to ovulation is essential to maximizing the chance of pregnancy (see Table 7:5). The ovum has a life expectancy of only 12 hours if it is not fertilized. In fact, the opportunity for fertilization is thought to last only a few hours; thus, intercourse during the 24 to 48 hours before ovulation ensures that sperm are present, and ready to fertilize the ovum when it is ready.⁵¹

Table 7:5 Probability of conception by day of coitus

Coital day*	Conception rate
-5	0.08
-4	0.17
-3	0.08
-2	0.36
-1	0.34
0 (ovulation)	0.36
1	0.00

*Calculated for ovulation day

Source: Wilcox, et al. (1995)

COITAL TECHNIQUE

If a woman's uterus is anteflexed (tipped slightly forward, as 70% of uteri are), the best position *may* be with the woman on her back, with hips supported and elevated by a pillow. This position would tilt the vagina to allow the semen to pool near the cervix. Having the woman remain in the position for 20 minutes or so after intercourse may give sperm more contact time with the cervix, allowing more sperm to ascend to the fallopian tubes.

CHEMICALS

Chemicals or other materials in the vagina may affect sperm viability. Douching and lubricants may have negative effects on fertility.

MULTIPLE SEXUAL PARTNERS

Exposure to multiple partners increases the risks for STIs and pelvic inflammatory disease (PID), which can cause irreversible tubal damage and ectopic pregnancy. Having multiple sexual partners also increases the risk of cervical intraepithelial neoplasia and other conditions that may require treatment, such as freezing the cervix, laser treatment, conization, and, possibly, hysterectomy. Some women develop antibodies to sperm, a condition that some clinicians believe is more likely to occur in women exposed to multiple partners. Regular use of condoms (except when pregnancy is desired) may help to prevent STIs and cervical intraepithelial neoplasia.

SEXUALLY TRANSMITTED INFECTIONS

The relationship between STIs and PID is discussed in Chapter 6.

Gonorrhea and Chlamydia. Gonorrhea and chlamydia are major causes of cervicitis and PID, which are associated with tubal disease and pelvic adhesions. In men, these organisms cause urethritis, epididymitis, and, possibly, accessory gland infection. These infectious diseases may cause between 10% and 90% of all infertility, depending on the geographic region and particular group studied. Although PID is the major cause of tubal infertility, chronic cervicitis may produce subfertility in some women. Chlamydia, despite its milder signs and symptoms, apparently causes more severe subclinical tubal inflammation with subsequent tubal damage than does gonorrhea.^{16,43} Inadequately treated chlamydial salpingitis may appear to improve while tubal damage worsens. PID from any cause produces tubal scarring. When both tubes are scarred, adhesions either completely occlude the tube or damage the delicate mucosa and cilia necessary to assist the

movement of sperm and ova. Other pelvic adhesions (scars) may limit tubal mobility, motility, or contact with the ovary, thus interfering with capture of ova. Many of the same factors that cause pelvic damage and impair fertility also increase the likelihood of ectopic pregnancy, which may further damage the reproductive system.⁷

Human Papilloma virus. Human papilloma virus (genital warts) is a frequent precursor to cervical dysplasia. The effect of that disorder on fertility depends on treatment, which may be a required hysterectomy (should cervical cancer be diagnosed), cryosurgery, a cone biopsy, or similar treatment of the cervix for simple dysplasia. Scars from cervical treatment or damage to the cervical mucous cells sufficient to cause cervical incompetence are associated with preterm deliveries and possible pregnancy loss.

Mycoplasma. Although *mycoplasma* are frequently found in patients with other STIs, it is not known whether these organisms cause damage.

PARASITIC DISEASES

Filariasis. This parasite can damage the lymphatic drainage system of the external genitalia. In men, this condition can result in inflammation and swelling (sometimes dramatic swelling known as elephantiasis) of the scrotum, testes, epididymis, or vas deferens. In the tropical areas where this disease is prevalent, it may be a significant cause of male infertility.³⁹ In women, filariasis may decrease coital frequency, but little is known about the direct effects on female fertility.²⁴

Malaria. In women, malaria may cause high fevers and impair fetal and maternal nutrition. Infestation of the placenta may lead to spontaneous abortion or fetal loss.³⁹ In men, severe malarial fevers can raise the scrotal temperature enough to alter spermatogenesis. In some areas where malaria is endemic, 60% of men suffer malarial fevers high enough to affect semen quality.²⁴

Schistosomiasis. Caused by a waterborne parasite common in many African countries, schistosomiasis has not been directly linked

to male or female infertility.²⁴ Severe chronic infection causing liver damage may harm the individual's general health, sex steroid hormone metabolism, and sex drive.³⁹

Toxoplasmosis. Transmitted primarily through cat feces and eating raw meat, toxoplasmosis may damage a developing fetus and cause fetal wastage in women who have a primary infection. Primary infections generally resolve spontaneously and confer immunity against later infections. Toxoplasmosis is not a significant cause of infertility.³⁹

Trypanosomiasis. Known as *African sleeping sickness*, trypanosomiasis causes high fevers that may affect sperm production. It may also interfere with pituitary function, leading to menstrual disorders and fetal loss in women and feminization and impotence in men.²⁴

OTHER INFECTIOUS DISEASES

Leprosy (Hansen's disease). In its lepromatous manifestation, leprosy can cause testicular atrophy in some men with untreated infection and has been associated with male infertility. Neurologic damage from leprosy may result in impotence. In some couples, decreased coital frequency may stem from the psychosocial consequences of the disease. No female infertility caused by leprosy has been identified.³⁹

Mumps. If it leads to orchitis (testicular inflammation), mumps may cause secondary testicular atrophy in the small number of men infected after puberty. Bilateral orchitis occurs in perhaps 1% of adult males with mumps; most will recover without impaired fertility.³⁹

Tuberculosis. Tuberculosis is more prevalent in populations suffering from poverty, malnutrition, overcrowding, poor housing, or poor working conditions. Tuberculosis of the genital tract may develop in men or women following primary pulmonary infection, which is often unrecognized. Infection and inflammatory response may damage the fallopian tubes or the epididymis and vas deferens. Genital tuberculosis may cause a large proportion of infertility cases in Africa, which has a high prevalence of untreated tuberculosis.³⁹ One South African study found positive *M. tuberculosis* cultures in 21% of

women seeking infertility services who had no indications of infection other than infertility.³⁰

Postpartum and postabortion infections. These preventable infections cause high rates of maternal mortality and secondary infertility. Postpartum infections are most prevalent where traditional birth attendants may introduce contaminating organisms by using unsanitary tools or methods. Postabortion infections are most common where safe, legal abortions performed by trained medical personnel are not available. Untrained practitioners or the use of folk methods are likely to introduce contaminating organisms or lead to an incomplete abortion, two serious risk factors in life- and fertility-threatening pelvic infections.^{39,54} In the WHO study, 76.2% of African women with infection-related infertility cases had a history of either postpartum or postabortion complications.⁵³

Sickle cell disease. In men, sickle cell disease has been documented as a cause of recurring priapism, with possible impotence from tissue and nerve damage leading to male infertility. In women, sickling crises or alterations in placental blood flow or oxygenation have been clearly associated with an increased rate of fetal wastage.³¹

Nutrition. Severe malnutrition is associated with infertility and fetal wastage. Even moderate nutritional deprivation leading to a drop of 10% to 15% below normal weight can interfere with menstrual cycles in women.²⁴ The percentage of body fat should be greater than 22% to permit regular ovulatory cycles.¹⁵ Poor nutrition can weaken the immune system and increase the chances of acquiring an infectious disease, which can compromise fertility. Likewise, many infestations or diseases such as hookworm and malaria can lead to anemia, which may cause fetal and maternal mortality.²⁴ Obesity also may lead to less frequent ovulation or to less frequent intercourse, thereby contributing to fertility problems.⁴⁰

Toxic agents. Toxic agents may well emerge as one of the principal causes of infertility among couples with no anatomic cause. Exposure can occur from occupational hazards (e.g., farming, factory work, mining); contaminated air, water or food supply; drug ingestion; or other sources.

Lead, toxic fumes, and exposure to pesticides are suspected of causing or contributing to infertility.^{50,54} In women, lead poisoning reduces the likelihood of fertilization and increases the likelihood of fetal wastage. Cases of spontaneous abortion among agricultural workers have been reported. In men, exposure to lead can reduce both sex drive and sperm count. Pesticide exposure can also reduce sperm count.⁵⁰

Smoking or alcohol use. In men, smoking tobacco and drinking alcoholic beverages may cause poor sperm quality. In women, both smoking and heavy alcohol use are associated with lower conception rates³ and increased rates of spontaneous abortions. Smoking also appears to increase slightly the risk of placenta previa. Smoking and alcohol use also negatively affect the developing fetus and may result in low-birthweight babies.⁴²

Medications. In men, narcotics, tranquilizers, antidepressants, some antihypertensives, and drugs such as guanethidine and methyldopa may cause impotence. Amoebicides, antimalarial drugs, nitrofurantoin, sulfasalazine, cimetidine, certain antihypertensives, and methotrexate may affect sperm production.^{5,34,38} In women, habitual use of narcotics or barbiturates apparently decreases regularity of ovulation. Systemic, powerful anticancer drugs exert many tissue effects that may include testicular or ovarian failure, even after only one cycle of chemotherapy. Many other prescription medications, including tetracycline, several antiseizure medications, some antidepressants, some tranquilizers, and coumadin, are clearly associated with an increased risk of fetal defects. Many of these drugs may also be associated with fetal wastage.⁴² If possible, couples attempting to conceive should avoid all medications.

Surgery. In men, sexual function may be reversibly or irreversibly impaired by surgery involving the penis, scrotum, prostate, or pelvis, all of which may cause nerve damage. In women, ovarian, cervical, or uterine surgery for benign processes may cause subsequent difficulties with fertilization or ovulation or lead to fetal wastage. Adhesions from any pelvic or abdominal surgery may interfere with conception.

Female circumcision. The removal of part or all of the external female genitalia, a ritual practice in parts of Africa, causes infertility in some women. The immediate consequences of the surgical procedure performed on prepubertal girls may include infection, hemorrhage, and shock. Later consequences (especially in women who undergo the extreme forms of the procedure) may include infection ascending into the reproductive tract and scarring that causes infertility related to improper drainage of urine and menstrual blood, difficulty with intercourse because full penile penetration is precluded, perineal tears and upper genital tract infections.^{24,39} (See Chapter 2 on Traditional Practices.)

Radiation. Exposure to radiation may be occupational, accidental, iatrogenic, or a therapeutic component of cancer treatment. The dose and type of irradiation, as well as the site or focus of energy, may produce different results. Therapeutic radiation treatments in both men and women can sometimes be tailored to minimize gonadal exposure to optimize future fertility and gonadal function. In men, irradiation may cause chromosomal aberrations³³ and increase the risk of testicular cancer.⁵ In women, irradiation may cause ovarian failure, fetal wastage, or fetal damage.⁴²

Physical exertion or heat. Some highly trained female athletes, such as long-distance runners and professional dancers, may experience reversible amenorrhea without any apparent long-term detrimental effects on their fertility.¹⁵ However, they may be at increased risk for bone loss.¹⁹ Men who take frequent hot showers or whirlpool treatments or whose occupations involve working in high temperatures (for example, furnace workers) may subject the scrotum to temperatures high enough to reduce sperm production temporarily.⁴⁴ There is no evidence that endurance training leads to male infertility.²

Tight clothing. Jockey shorts and tight pants are thought to have the same suppressive effect on sperm production as do hot showers, because they warm the scrotum. No evidence supports this hypothesis.

PREVENTING INFERTILITY

The family planning or primary care clinic can provide preventive infertility counseling and medical examination for early diagnosis and treatment of STIs. Routine screening of sexually active individuals for STIs prevalent in the population also may prevent adverse consequences of the diseases. Family planners who desire to prevent infertility should do the following:

- Be up to date in their knowledge on preventing, diagnosing, and treating STIs and PID.
- Be aware that contraceptive choice influences the risk of PID.
- Begin or continue public health education efforts so that the consequences of untreated sexual infection may be fully understood by all clients, particularly young people.
- Work within the community to ensure that all individuals, including minors, have access to early and confidential diagnosis and treatment of STIs.
- Encourage sexually active young people to use condoms, diaphragms, and spermicides, which can be used along with oral contraceptives and intrauterine devices (IUDs).
- Assist young persons in identifying risk factors for STIs.

IUDs

Historically, clinicians have been concerned about whether IUD use confers an increased risk of contracting PID.^{9,12,21} The pelvic infection risk is apparently small for noninfected couples in mutually faithful relationships. In addition, the Levonorgestrel IUD may be associated with less risk of PID than are other IUDs.⁴⁶ Recent studies suggest that previous risk estimates of PID among IUD users may have been high.⁹ Family planning workers should take the following actions:

1. Be conservative in using IUDs for nulliparous women who plan to have children. Many clinicians refuse to insert IUDs into nulliparous women.

2. Avoid recommending the IUD to women who are at greater risk for STIs and PID (especially adolescents).
3. Screen for STIs in all patients in whom an IUD is inserted.
4. *Never* insert an IUD into a woman with an untreated STI.
5. Consider giving antibiotic prophylaxis to women who live in areas where incidence of STIs is high. (See Chapter 15 on Interuterine Devices.)
6. Assume that a vaginal discharge in the presence of an IUD signals an infection until proven otherwise. (See Chapter 15 on Interuterine Devices.)
7. Be certain that clients are aware of the danger signs of a pelvic infection and that they know where to go and what to do if these signs occur.

THE PILL

Compared with IUD users or those who use no contraceptive method, women who use oral contraceptives have a lower risk of symptomatic PID, possibly because they have decreased menstrual flow and myometrial activity, as well as a less penetrable cervical mucus.⁹ (See Chapter 13 on Combined Oral Contraceptives.) Oral contraceptives may also protect against tubal damage.⁹ The pill appears to decrease the likelihood of acute gonococcal pelvic infection.³⁶ Although the relationship between oral contraceptive use and chlamydia infection risk is still being clarified, it is now accepted that the risk of cervical infection with chlamydia is enhanced among oral contraceptive users (as compared with non-users).^{9,49} The risk of ascending infection is currently unknown, but oral contraceptive use may lessen the damaging effects of inflammation.⁹

Amenorrhea and temporary infertility following use of the pill do not appear to seriously threaten female fertility. These symptoms are most commonly found in women who have irregular menses before beginning oral contraceptive therapy.

Because an increased risk of cervical cancer among pill users appears likely, screening for cervical cancer and early diagnosis and treatment of STIs is important. (See Chapter 13 on Combined Oral Contraceptives.) Family planning workers should take the following actions:

1. Educate patients about the relationship between the pill and PID.
2. Urge pill users at high risk for STIs to use barrier contraception as well and to limit their number of sexual partners.

BARRIER METHODS

The use of condoms and other barrier methods can reduce the risk of STIs such as chlamydia and gonorrhea, both of which are associated with PID and tubal infertility.⁹ (See Chapter 6 on Sexually Transmitted Diseases.) Clients who have had a previous episode of PID especially should be counseled about barrier methods to avoid infection.

Unprotected intercourse can lead to the development of sperm antibodies in women, although it is unclear whether immunity to sperm causes infertility. The use of condoms has been widely encouraged to reduce the risk of developing immunologic reactions to sperm.⁴²

STERILIZATION

Family planners have expressed concern over the number of requests for sterilization reversal, an expensive procedure with uncertain prognosis. Table 7:6 shows the reasons for requesting reversal in a survey of 100 female patients.

Table 7:6 Reasons for requesting reversal of sterilization

Reason	Percentage
Change of marital status	63
Death of child	17
More children wanted (marital status same)	10
Psychological reasons	6
Other tragedy	4

Source: Gomel (1980)

Family planning workers should take the following actions:

1. Emphasize the permanence of the procedure.
2. Avoid using the term "tying the tubes" to describe sterilization procedures; to some patients, such reference might imply that "untying the tubes" is feasible.¹⁷ (See Chapter 21 on Voluntary Surgical Contraception.)
3. Make efforts to assure clients have access to reversal procedures. This may require changes in laws relating to health insurance and in public funding of health systems.

ABORTION

Although complications after an abortion rarely occur if it has been performed by trained medical personnel in a modern medical facility and with modern, sanitary, safe equipment, there is a slight risk that subsequent fertility may be reduced. No epidemiologic evidence supports a fertility risk to women experiencing first trimester vacuum abortions. However, a slightly increased risk to reproductive performance exists when larger cervical dilation is used for some dilation and curettage (D&C) abortion procedures or when the abortion is performed in the second trimester.²⁰ The most obvious way to prevent these rare occurrences is to prevent the pregnancy (and thus the abortion).

When abortions are performed by untrained personnel without adequate attention to hygiene or appropriate equipment, the risk of complications is much higher. Illegal abortions are frequently provided in unsafe conditions. In addition to postabortion infections, perforation, hemorrhage, scarring, incomplete abortion, and cervical lacerations are more common in illegal or “homemade” abortions. (See Chapter 22 on Postabortion Care: Treating Complications and Providing Contraception.) Illegal abortion is a major cause of maternal mortality in Africa. (See Chapter 1 on Benefits of Family Planning.)

THE INFERTILITY EVALUATION AND THE FAMILY PLANNER

Triaging (sorting by urgency) is the important task of the first counselor to see the infertile client or couple. A couple who has had sufficient exposure (about 12 months of unprotected intercourse) deserves to discuss the topic with their provider and have their fertility investigated or be referred for a workup, rather than simply be given advice to “wait and see.” Begin an infertility evaluation as soon as is reasonable, if the following conditions apply:

1. The woman is in her late 30s. Because a steep decline in fertility occurs after age 40, women over age 35 should receive priority for early assessment.
2. The woman reports irregular menses. This symptom could signal sporadic ovulation, a condition unlikely to improve spontaneously unless the woman is an adolescent. It could be a sign of premature ovarian failure (early menopause). Irregular or abnormal bleeding may be a symptom of pelvic infection or other gynecological disease, making evaluation necessary. Many of these problems are easily and successfully treated.
3. The medical history for the couple includes mumps in the man; repeated miscarriages, ectopic pregnancy, or PID in the woman; or previous pelvic surgery or other serious medical problems in either partner. Because time is not likely to

improve such problems but will cause the couple's fecundity to steadily diminish, diagnose the cause of subfertility and begin infertility treatment promptly.

4. The woman has severe progressive dysmenorrhea or dyspareunia. These symptoms may suggest endometriosis or other pelvic disease.
5. The woman used an IUD in the past; had a pelvic infection; had surgery on an ovary, a tube, or the uterus; or has any finding that might suggest damage to her pelvic organs (e.g., endometriosis, ovarian cyst, fibroid). An early assessment, including a laparoscopy, can lead to an early diagnosis and treatment or to reassurance that "more time" is needed.
6. The couple lives in an area with a high endemic incidence of STIs.

Even if economic, personnel, and laboratory resources may be limited, some basic initial services can be provided by most family planning programs. The following services may help some couples improve fertility and may provide the first steps for those who need further evaluation or treatment. Evaluation begins with the first four items listed and, where resources and training permit, includes all of the following:

1. Educating the patients
2. Gathering pertinent historical information
3. Providing a thorough physical exam
4. Providing a resource for reassurance, counseling, and emotional stability, including referral as needed
5. Systematically evaluating the possible defective areas:³⁷
 - Counseling couples about fertility awareness techniques (see Chapter 18 on Fertility Awareness) and optimal coital timing
 - Checking couples for asymptomatic sexually transmitted infections (STIs) that could cause subfertility

- Determining whether ovulation takes place, as indicated by basal body temperature or cervical mucus records (or urine luteinizing hormone test kits where available)
 - Analyzing semen
6. Making a plan and initiating treatment based on information gathered, and counseling couples with potentially serious or undetected fertility problems about their options for further evaluation and treatment
 7. Reassessing progress at predetermined intervals
 8. Referring couples to other infertility specialists or adoption agencies as needed, explaining the anticipated short- and long-term costs and chances for success with further treatment, and discussing the options of adoption or remaining childless

HISTORY AND PHYSICAL ASSESSMENT

Before beginning the evaluation process, explain the main steps that will be needed for diagnostic evaluation and describe the capacity of your facility. The history and physical exam may indicate the need for further evaluation. Explain that your approach is only one of many potential testing options. A recommended schedule of evaluation is described in Table 7:7. Clinics that carry out only a few of these items should provide referrals for the remaining services. If referral becomes necessary, try to ensure that procedures are not duplicated unnecessarily and that an orderly evaluation can be continued. Following a standard set of guidelines, such as the WHO flow sheet of the standardized approach to the infertile couple,⁵⁴ will enhance the effectiveness of referral prognosis.

Table 7:7 Fertility assessment schedule

The initial assessment of the couple should proceed in a systematic manner, with the objective of completing the first line of infertility evaluation within two or three cycles. A schedule for visits is as follows:

Visit 1

Family planning clinic visit (ideally day 5-10 of menstrual cycle)

Previous medical records obtained

Complete medical history of man and woman

Physical examination of man and woman

Develop investigation plan

Between Visits

Man obtains physical exam if not already completed

Semen evaluation

Basal body temperature and fertility awareness record keeping (see Chapter 18)

Visit 2

Clinic visit (pre-ovulatory day 13 of 28-day cycle) to check cervical mucus

Between Visits

Blood tests on day 22 of 28-day cycle: serum progesterone, etc.

More Extensive Tests (if available)

Laboratory tests, if indicated, such as anemia screening, thyroid or prolactin level, or progesterone level at mid-luteal phase to confirm ovulation

Hysterosalpingogram on day 5-10 of cycle when not bleeding

Source: Gomel (1980)

History

Ask about the individual's attempts to conceive. Interview each individual about exposure to the factors that influence reproductive performance, including anatomical, infectious, and toxic factors. After interviewing the couple together, the counselor should interview the man and woman separately to obtain confidential information.

Physical Examination of the Woman

Visually evaluate the hair distribution and body and breast development for signs of endocrinopathies or developmental deficiencies

such as hypogonadism, adrenal hyperplasia, hypothyroidism, ovarian dysfunction, and hyperprolactinemia. Perform a complete pelvic exam (palpation of uterus and adnexae and a speculum exam of vagina and cervix) to detect any uterine hypoplasia, adnexal tumors, or cervical lesions. The exam should indicate whether dyspareunia may be a problem.

Physical Examination of the Man

Visually inspect sexual characteristics to identify endocrinopathies such as hypogonadism or Klinefelter's syndrome (the genetic XXY anomaly often associated with infertility). A penile exam can reveal hypospadias (displacement of the urethral opening) or phimosis (constriction), cysts, cryptorchidism (undescended testicles), vas thickening or absence, hydrocele (fluid accumulation in testes or along spermatic cord), or varicocele (dilation of the veins of the spermatic cord in the scrotum).

Semen Evaluation

Usually, arrangements must be made with the laboratory before the man brings in a specimen for a semen evaluation. (Table 7:8 gives directions for obtaining a semen specimen.) The technician will need 2 to 5 cc and will look for directional motility in over 60% of sperm present, 60% normal morphology, and a count of at least 20 million sperm/ml. If the sperm count is at least 15 to 20 million, the absolute number of sperm is probably less critical than their motility and morphology. The presence of bacteria or white blood cells, as well as semen viscosity, also should be recorded. More than one evaluation may be necessary to assess accurately the sperm and semen status, particularly if the results are borderline—WHO recommends two samples taken at least 2 weeks apart. (Table 7:9 provides the WHO criteria for semen evaluation.⁵²)

Following the initial history, physical exam, and basic diagnostic laboratory procedures, inform the patient about the further tests that may be needed and make initial recommendations.

Table 7:8 Directions for collecting semen for evaluation

-
1. Abstain from intercourse (no ejaculation) for at least 3 and no more than 5 days. Do not drink alcohol or take a hot shower or bath just before producing the semen.
 2. Masturbate. Ejaculate into a small, sterile, dry, wide-mouthed jar.
 3. Take the semen specimen to the laboratory within an hour of collection.
 4. Keep the semen specimen close to body temperature.
-

INTERMEDIATE ASSESSMENTS AND TESTS

Patients should be instructed on how to record basal body temperatures and chart mucus changes, as described in Chapter 18. This documentation often helps verify ovulation, determine the timing and frequency of intercourse, and educate the client about the physiology of the menstrual cycle. The timing of various tests also can be recorded and guided by this documentation.

Mucous assessment can be used to verify ovulation. At a visit 1 day prior to ovulation, a small amount of cervical mucus is drawn into a thin catheter from the endocervical canal and evaluated by microscope. Abundant acellular, watery cervical mucus that exhibits ferning and has a spinnbarkeit of greater than 8 cm is good evidence of a normal ovulatory cycle pattern.

Table 7:9 Criteria for a normal semen sample

A semen sample is considered normal if it meets all of the following conditions:

Spermatazoa

Concentration	>20 x 10 ⁶ /ml
Motility	>40% progressively motile
Morphology	>50% normal forms
Viability	>60% alive
Agglutination	none

Seminal fluid

Normal appearance
Normal viscosity
Less than 10 ⁶ white blood cells/ml

MORE SPECIALIZED TESTS (NOT AVAILABLE AT MOST FAMILY PLANNING CLINICS)

Economic considerations are critical in deciding whether to introduce specialized services. The more technology-driven evaluations and treatment far exceed most people's financial resources and are too expensive for most health programs to provide. Careful consideration must be given in determining the extent of services to be covered in the family planning clinic.

Laparoscopy

Consider performing a diagnostic laparoscopy when pelvic pathology (such as anatomical abnormality or damage or obstruction of tubes) is suspected or when the patient has a history of PID.

COUNSELING ABOUT TREATMENT POSSIBILITIES

Frequently, the role of the provider in infertility is to reassure (intelligently) and intervene at the right time. A principal responsibility is to tell the patient when the time has come to consider adoption, to discontinue therapy, or to proceed on some other course.

Often, simple instructions about intercourse technique and timing are helpful. Encourage the couple to maximize the chance for pregnancy by having intercourse two or three times weekly, with special attention to the two or three days immediately preceding expected ovulation. Avoid use of any vaginal products—including lubricants, douche, or drying agents.

Infertility therapy, like any other medical therapy, is generally directed toward curing or improving diagnosed anatomic and physiological problems. In addition, comprehensive infertility treatment seeks to maximize the chance of pregnancy by optimizing all conditions for conception. For many patients who have no identifiable cause of infertility, the comprehensive approach is the only therapeutic option, provided that all possible diagnostic tests have been adequately

completed. As the treatment of identified problems is well outlined in general references, it will not be described in great detail here.

Male infertility may be treated with insemination from donor sperm in cases of azoospermia or impotence. Particular attention must be paid to guaranteeing that the semen does not carry any organisms that produce STIs, including human immunodeficiency virus (HIV). Criteria for preparation, storage, and screening have been developed by the American Fertility Society. Its current recommendation is to use sperm that has been frozen and quarantined for 6 months. If the donor is still HIV antibody negative after 6 months, the sperm may be released.¹⁸

Female infertility may be treated with a much wider range of approaches:

1. Cervical mucus problems impairing conception may be treated with insemination or uterine instillation of a small amount of specially prepared sperm.
2. Cervical incompetence interfering with continuing pregnancy may be treated with cerclage, bed rest, or both. Cerclage is the passage of a strong suture material around the cervix, like a purse string, to prevent premature dilation.
3. Ovulation disorders can be treated with drugs to induce ovulation (such as clomiphene citrate, which suppresses estrogen's suppressive effect on ovulation). In women whose ovulation is suppressed by hyperprolactinemia (high blood levels of the pituitary hormone prolactin), ovulation may be induced with drugs that suppress prolactin, such as bromocriptine.
4. Damage to ovaries, such as torsion, surgical removal, hemorrhagic cyst, or premature menopause that has eliminated primordial follicle tissue required to produce new ova, can be overcome only by some use of high-technology fertility medicine with ova donated from another woman.
5. Uterine or tubal abnormalities may be corrected by surgical procedures (in some cases "microsurgery"). Some congenital

anomalies, such as true bicornuate uterus, may not be amenable to surgical repair. In the case of tubal damage caused by endometriosis, hormonal suppression of the displaced endometrial tissue may be prescribed before or instead of surgery. Tubal or pelvic scarring due to PID may be improved with microsurgery of the tube or laparotomy to allow lysis of pelvic adhesions. Currently, the delicate cilia and mucosa of the tubal lining cannot be surgically regenerated, and the body's capacity to repair itself is low. In vitro fertilization may be the only way to bypass damaged fallopian tubes.

High technology approaches to overcoming infertility have had some remarkable developments in the past 15 years. These expensive methods require expert practitioners and procedures and result in successful pregnancies at rates near the normal fecundity rates. The following are two of the major high-technology approaches:

- *Gamete intrafallopian tube transfer* (GIFT) involves placing a mixture of ova and sperm into the fallopian tube. It is used primarily for unexplained infertility and where the fallopian tubes appear normal. National surveys in the United States indicate a pregnancy rate of 29% per treatment cycle.²⁶
- *In vitro fertilization* (IVF) involves placing mature ova (harvested during laparoscopy or transvaginally using an ultrasound-directed needle to aspirate the oocyte) with specially prepared sperm in a laboratory tissue culture medium and incubating them to allow fertilization. Fertilized ova that have successfully attained a certain maturity (generally between two and eight cell divisions) are placed in the uterus via a transcervical catheter. Surveys in the United States indicate a pregnancy rate of 19% per treatment cycle.²⁶

GIFT and IVF frequently use ovulation stimulation drugs to increase the number of ova ready for harvest.

COPING

The effect of permanent infertility, coupled with the stresses of fertility evaluation and treatment, may damage a couple's relationship or an individual's self-concept. Explore the coping mechanisms that are used in the client's cultural context. In some cultures, for example, an infertile man may ask a close relative to father his children. Infertile women may be encouraged to adopt a relative's baby. In some cases, the husband of an infertile woman may divorce her and marry someone who can provide children. Family planning agencies should remain sensitive to the special needs of infertility patients.

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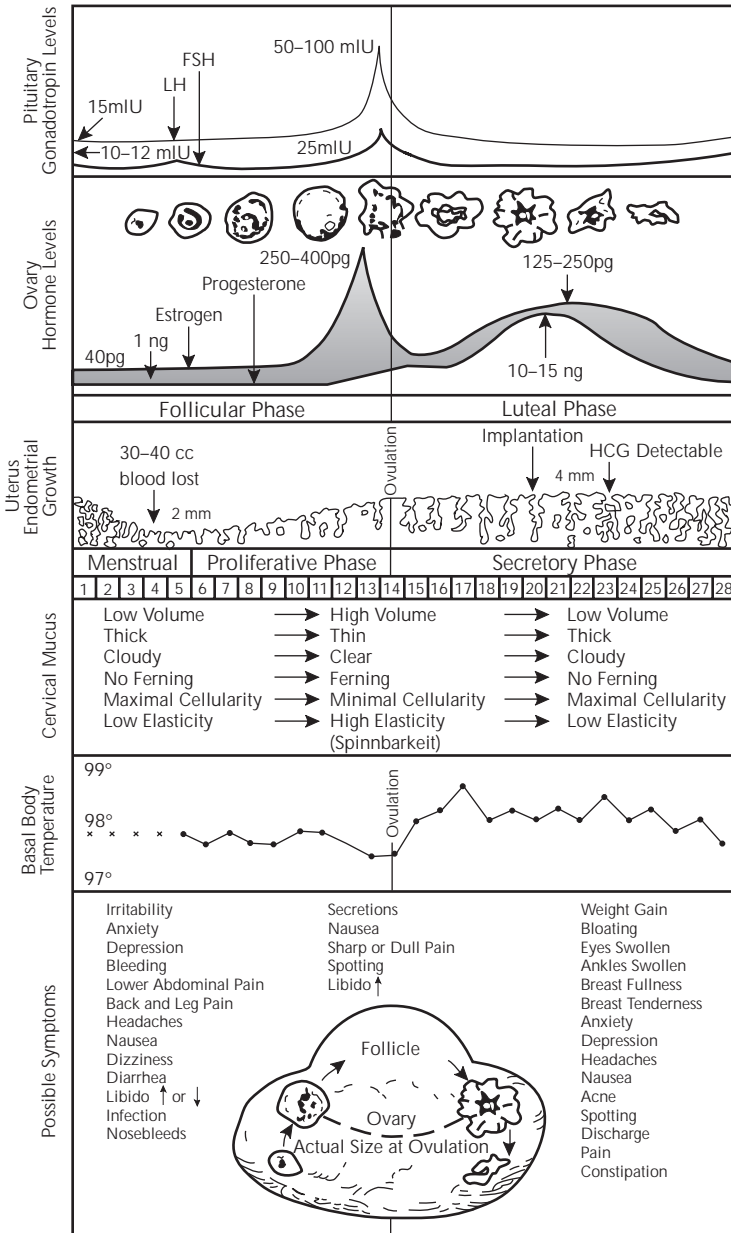
The Menstrual Cycle and Disturbances

Female fertility is cyclic, unlike male fertility, which is relatively constant. Ovulation occurs only once a month and is regulated by a hormone system that involves the hypothalamus, the pituitary gland, and the ovaries. When a woman understands her menstrual cycle, she can better plan, diagnose, and prevent pregnancies. When providers understand the menstrual cycle, they can better assist the client in planning or preventing pregnancies.

MENSTRUAL CYCLE REGULATION

The menstrual cycle is regulated in the hypothalamus. During puberty, the hypothalamus begins secreting hormones that stimulate the pituitary gland to secrete follicle-stimulating hormone (FSH) and luteinizing hormone (LH). In turn, FSH and LH stimulate production of the ovarian hormones estrogen and progesterone and interact with them to regulate ovulation and menstruation. Anything that disrupts the balance of these four hormones during the cycle can disrupt reproductive function. (See Figure 8:1.)

Figure 8:1 Menstrual cycle events: hormone levels, ovarian, and endometrial patterns, and cyclic temperature and cervical mucus changes



FSH = Follicle Stimulating Hormone
 LH = Luteinizing Hormone
 HCG = Human Chorionic Gonadotropin

MENSTRUAL CYCLE LENGTH

In this chapter, the menstrual cycle events are described for an average 28 day cycle; but a normal menstrual cycle can last anywhere from 21 to 35 days. The menstrual cycle can be divided into two distinct phases: The first phase begins with the onset of menses and ends at ovulation and the second phase spans the time from ovulation, until the first day of the next menses. The length of the second half of the cycle is very consistent, usually 14 days. For some women, the length of the first half is less consistent and may last anywhere from 12 to 21 days.

FIRST PHASE OF THE CYCLE (FOLLICULAR PHASE)

Days 1 - 2 The menstrual cycle begins with the first day of menstrual bleeding. The lining of the uterus begins to shed, because levels of estrogen and progesterone have declined from the previous cycle. During the first few days of the cycle, numerous ovarian follicles begin growing. These follicles are balls of cells, each containing an oocyte. During a menstrual cycle a woman may have 10 to 20 follicles growing. The cervical mucus is thick, cloudy, and scant.

Days 3 - 5 For most women, bleeding will end sometime during these days. About one-third of the endometrial lining remains after the bleeding ends.

Days 6 - 11 Estrogen, produced by the ovarian follicles, is primarily responsible for stimulating regrowth of the lining during this time, and thereby ensuring a nutritious home for the potential embryo. This lining will be shed at the end of the cycle if pregnancy is not attained. The hormone levels are generally low during this period, but the pituitary sends increased amounts of FSH to help mature the follicles. Most of the 10 to 20 follicles grow briefly, then recede. One remains to mature. Because it is so receptive to FSH, the remaining follicle continues to grow and produces the oocyte for that cycle. It is also responsible for producing increased amounts of estrogen.

Days 12 - 13 Estrogen production accelerates, triggering a sudden increase in LH. As LH reaches its peak, estrogen production is temporarily inhibited, causing its level to dip. This combination of hormonal surge and dip is thought to cause ovulation. A slow increase in progesterone production also begins here just before midcycle. Because of the temporary midcycle dip in estrogen level, a brief interval of midcycle endometrial bleeding can occur. Ovulation takes place 34 to 36 hours after the LH surge begins (10 to 12 hours after LH peaks).

OVULATION

Day 14 Ovulation may take place earlier or later, but it is normally about 14 days *before* onset of the next menses. The ovary releases a mature egg (oocyte). As the follicle ruptures it releases 1 cc to 10 cc of follicular fluid, and the barely visible oocyte passes into the fallopian tube. Lower abdominal pain is often associated with ovulation. The cervical mucus at ovulation is copious, thin, and clear. This mucus can be stretched into a strand several inches long (this type of mucus is known as *spinnbarkeit*) and forms a fern pattern when dried on a microscope slide.

THE SECOND HALF OF THE CYCLE (LUTEAL PHASE)

Days 15 - 28 After the follicle ruptures at ovulation, the follicle walls collapse, and the follicle cell becomes the corpus luteum. The corpus luteum stays in the ovary and secretes increasing levels of estrogen and progesterone. The increased progesterone causes a change in cervical mucus, making it scant but thick and sticky.

The endometrial lining is now preparing to support an embryo and allow implantation. Progesterone levels reach their peak in the middle of the luteal phase, and FSH and LH levels fall. If fertilization and implantation occur, progesterone will continue to be released by the corpus luteum until the placenta matures. If fertilization does not occur, the corpus luteum disintegrates and the levels of hormones drop off, causing the endometrial lining to shed and menstrual bleeding to begin.

FERTILIZATION AND EARLY PREGNANCY

A woman is most likely to conceive if fresh sperm are present in her reproductive tract when ovulation occurs. Sperm can live in the woman's reproductive tract for as long as 3 to 5 days. The ovum can be fertilized near the day of ovulation, possibly for as long as 12 hours after ovulation; the woman's monthly fertile interval ends the day of ovulation or the following day.⁶

Fertilization involves a complex series of events that occur over many hours. Usually a single sperm attaches to the oocyte. The zona pellucida, a gelatinous halo that surrounds the oocyte, responds by blocking other sperm. The successful sperm releases enzymes that allow it to penetrate the zona and induce final maturation of the oocyte chromosomes. Fertilization usually occurs while the oocyte is in the outer third of the fallopian tube.

- *Day 1 and 2 following fertilization.* Cell division begins and continues for the first 2 days in the fallopian tube, creating a ball of cells called a morula.
- *Day 3 following fertilization.* The morula reaches the uterus, where it continues early embryonic development for another 2 to 3 days before beginning implantation.
- *Day 6 following fertilization.* The embryo is ready to begin implantation.
- *Day 12 following fertilization.* By this time, the embryo has implanted just under the endometrial surface, nourished by maternal blood pools, and the placenta begins to form.

Fertilization, early embryonic development, and implantation are complex processes. Many oocytes and sperm are abnormal and incapable of fertilization; some carry chromosome abnormalities incompatible with embryonic survival. After fertilization, many precisely coordinated events must occur for development and implantation to be successful. As a result, spontaneous loss is very common: approximately 50% of embryos do not survive. Because most of these losses occur during the first 2 weeks after ovulation, the woman is not likely to recognize the spontaneous pregnancy loss. Spontaneous loss is much less common after the first 2 weeks.

It is important for health care providers to understand the intricate functioning of the female hormonal cycles and physiology so they can provide patients with the most appropriate family planning choices. With the exception of barrier methods, all present forms of contraception are based on altering or blocking menstrual cycle events.

DYSMENORRHEA

Menstrual cramping, or dysmenorrhea, may occur with ovulatory cycles. Some women may experience cramping throughout their reproductive lives, some only intermittently, and others experience cramping rarely or never. Uterine cramping is caused by prostaglandins released when the lining of the uterus sheds. These prostaglandins cause uterine muscle to contract and smooth muscle contractions in the digestive tract cause other symptoms such as nausea and diarrhea.

Many women find their cramping pain is relieved by resting, applying gentle heat to the area, or taking common medications such as aspirin or ibuprofen (a very effective prostaglandin inhibitor). Combined oral contraceptive pills can prevent dysmenorrhea because they suppress ovulation. In some cases, progestin-only contraceptives may relieve dysmenorrhea.

When evaluating menstrual cramping, rule out the possibility of infection or early pregnancy because cramping pains may also be caused by disorders that may need treatment:

- Pelvic inflammatory disease (PID) (See Chapter 6 on Sexually Transmitted Diseases.)
- Fibroid tumors (leiomyomata)
- Endometriosis or adenomyosis
- Endometrial cancer
- Ectopic pregnancy, spontaneous abortion, or retained products of conception

ABNORMAL BLEEDING

For most women, the menstrual cycle lasts between 24 and 32 days, with 3 to 7 days of bleeding. The average woman will pass about 15 ccs of bloody fluid. Some women will have spotting (light bleeding) at mid-cycle, which is triggered by the temporary drop in estrogen levels occurring with ovulation. Hormonal contraceptives can alter menstrual bleeding patterns, causing amenorrhea, spotting between periods, or heavier bleeding. (See chapters on various contraceptive methods.)

A woman who experiences abnormal bleeding needs to be evaluated to discover the cause. Table 8:1 lists several reasons for abnormal bleeding. In rare cases, a woman with abnormal bleeding may need emergency care. Heavy blood loss can lead to shock. Early symptoms of shock include severe fatigue, faintness or weakness, dizziness.

MENOPAUSE

During the years before menopause, the ovaries gradually become unable to respond to the hormones released by the pituitary gland. Estrogen production drops and the production of FSH and LH increases dramatically. With these changes, fertility decreases, menstrual cycles become irregular, and menstrual flow tapers off. Some women may experience hot flashes—reddening and sweating of the skin lasting a few minutes and occurring throughout the day. These symptoms gradually improve within the first few years after menopause. Other menopausal symptoms include problems associated with persistently low estrogen levels: vaginal dryness and diminished bladder control. These symptoms generally begin months or years after menopause. Once women reach menopause, their need for calcium increases. Advise clients about how to increase calcium in their diets. Because uterine cancer is more common among women who have achieved menopause, suspect and evaluate any vaginal bleeding that occurs after menopause.

Table 8:1 Causes of abnormal bleeding

Pregnancy-related causes

- Spontaneous bleeding in early pregnancy
- Spontaneous abortion (miscarriage)
- Ectopic pregnancy
- Abnormal pregnancy (molar)

Vaginal causes

- Infection
- Human papilloma virus (warts)
- Vaginal atrophy
- Injury
- Foreign body
- Cancer

Cervical causes

- Infection
- Human papilloma virus
- Herpes
- Syphilis
- Ectropion
- Cervical polyps
- Cancer

Uterine causes

- Uterine polyps
- Benign fibroid tumors
- Infection
- Endometriosis
- Intrauterine device (IUD)
- Hyperplasia
- Cancer

Ovarian causes

- Follicular cyst
- Corpus luteum cyst
- Polycystic ovary disease
- Ovarian cancer

Other causes

- Pelvic Inflammatory Disease (PID)
 - Hormone treatment
 - Thorazine or other psychiatric drugs
 - Aspirin, antiprostaglandin drugs
 - Anticoagulant drugs
 - Blood clotting or platelet disorders
 - Leukemia
 - Liver disease
-

Source: Stewart et al. (1987)

HORMONE REPLACEMENT THERAPY

In some women, menopause symptoms can be severe. Many of the symptoms can be treated with hormone replacement, if it is available. Many women report fewer hot flashes, less irritability, and improved vaginal lubrication. In addition, hormone replacement therapy prevents osteoporosis and probably cardiovascular disease.¹ The risk of uterine cancer can be decreased by combining estrogen treatment with at least 12 days of progestin each month. The risk of breast cancer needs further study because research results conflict. Advise clients to examine their breasts for masses and to have their breasts examined professionally as well.

Not every woman can take estrogen treatment. Women with the following conditions should not take this therapy:

- Unexplained vaginal bleeding
- Active liver disease
- Chronic impaired liver function
- Recent blood clot formation (thrombosis)
- Cancer of the breast
- Cancer of the endometrium

A typical regimen consists of conjugated estrogen 0.625 mg with medroxyprogesterone acetate 5 mg daily.⁴ For some women who cannot take estrogen, medroxyprogesterone acetate 10 to 20 mg daily or Depo-Provera 150 mg every 3 months are alternatives to protect against hot flashes and, possibly, bone loss. Estrogen-containing vaginal cream helps alleviate vaginal dryness. Women who must avoid estrogen should be advised to avoid herbal preparations such as ginseng because they may have estrogen effects.

ADNEXAL MASS

Adnexal masses are extremely common. In some cases, the client may complain of pain in the lower abdomen (usually one-sided), tenderness, pain during intercourse, or a sense of fullness in the abdomen. Often, the client may have no symptoms.

ECTOPIC PREGNANCY

This is an emergency condition that must be ruled out whenever a mass occurs in the adnexa. Signs and symptoms may include vaginal bleeding, mild pregnancy symptoms such as breast tenderness or nausea, persistent pain that is one-sided or more generalized in the lower abdomen, a uterus size that is smaller than last period dates would suggest, or tenderness in the area of the fallopian tube. In some cases, a woman may have no signs or symptoms of an ectopic pregnancy. Internal bleeding from a ruptured ectopic pregnancy causes severe pain and can lead to shock. Frequent, careful follow-up, with daily examinations, may be needed until the diagnosis is clear. (See Chapter 9 on Pregnancy Diagnosis for further discussion.)

CANCER OF THE OVARY

An ovarian enlargement that persists, is larger than 5 cm, or occurs in a woman over age 30 needs a full evaluation. Rule out the possibility of pregnancy or infection. If pregnancy and infection are ruled out, obtain an image of the mass, either by x-ray or ultrasound. Even if the results are reassuring, surgery is likely to be necessary.

FUNCTIONAL OVARIAN CYST

Sometimes a normal ovarian follicle or corpus luteum can be unusually large. These cysts occasionally are as large as 8 cm to 10 cm in diameter and can disrupt the menstrual cycle. Rarely, a cyst causes pain from leakage or torsion (twisting) of the adnexa. In most cases,

however, the cyst and its symptoms resolve within a few weeks. If the ovary is 5 cm or smaller in a client who is younger than 30 years of age, not pregnant, and does not have an infection, arrange for a follow-up pelvic exam in 2 to 4 weeks.

VAGINAL HYGIENE

A woman's vagina normally maintains its own hygiene. Menstrual blood is not dangerous or dirty. Absorbent materials attached to undergarments or tampons placed in the vagina are sufficient to absorb blood and prevent the staining of clothing. These absorbent materials should be changed frequently throughout the days of blood flow.

Douching is unnecessary to maintain vaginal hygiene. Moreover, douching is associated with an increased risk for PID and ectopic pregnancy.^{2,3} Pregnant women especially should be warned about the risks associated with douching.

A persistent vaginal odor or abnormal discharges that does not clear on its own can be a sign of vaginal infection. Make certain the vagina does not contain any retained materials such as a tampon or other inserted items. Evaluate for infection. (See Chapter 6 on Sexually Transmitted Infections.)

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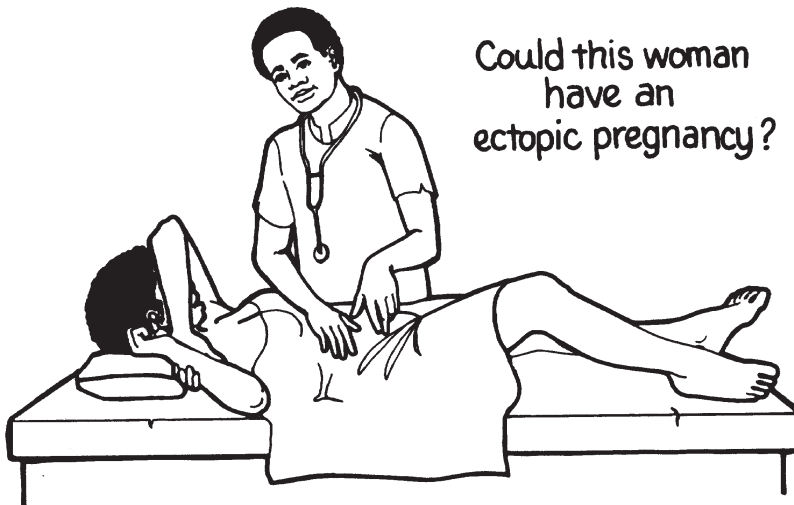
Pregnancy Diagnosis

Tazana had been married more than a year and still had not become pregnant. Always, it was "Tazana, when will you bring us grandchildren?" or "Tazana, have you no fruit to bear?" A few months ago, her monthly bleeding came late and raised her hopes falsely. Today, she was nearly 2 weeks overdue for her period. She felt tired and nauseated. Tazana hoped the doctor at the clinic could tell her whether she was pregnant—or whether she was sick, late, and still to await her turn at motherhood.

"Is my patient pregnant now?" You will ask yourself this question many times in your work as a family planning clinician. Sometimes the clinical situation is confusing. It is especially important to remember the possibility of pregnancy when evaluating a woman who has undergone surgical sterilization and has an abnormal menstrual pattern or possible pregnancy symptoms. When pregnancy occurs after surgical sterilization, the risk of ectopic (tubal) pregnancy is high.⁶ Skills for diagnosing early pregnancy are also essential so that your patient can begin pregnancy precautions and prenatal care during the first few weeks of her pregnancy, when the fetus is most vulnerable. You should have the following skills and knowledge:

- You should be able to diagnose ectopic pregnancy early. Detecting ectopic pregnancy before rupture could save your patient's life and increase the chance that her future fertility can be preserved.
- You should know how to ensure that your patients with an unintentional pregnancy get adequate counseling and to allow them to make a well-considered decision before proceeding on a course of action.
- You should know how to avoid inserting an intrauterine device (IUD) in a patient who is pregnant and not to use medications that are contraindicated during pregnancy.
- You should be able to evaluate a woman who has missed one or more periods for causes of amenorrhea and to detect problems such as retained pregnancy tissue or continuing pregnancy after a spontaneous or induced abortion.

Figure 9:1 Detecting an ectopic pregnancy before it ruptures can save a woman's life



Careful evaluation to detect pregnancy is especially important before inserting an IUD because of the risk of septic spontaneous abortion. It is also important before any medical treatment, such as extensive x-rays or toxic medication, that might cause injury to a developing fetus. It is prudent to check carefully for pregnancy before performing surgical sterilization or initiating long-term hormonal methods such as implants or injectables.

CLINICAL EVALUATION IN PREGNANCY

Based on findings from a good medical history and physical examination, you can be quite certain about diagnosing pregnancy in most cases. If the pregnancy is not normal or you are not certain, a pregnancy test may be helpful. Otherwise, repeating your clinical evaluation and examination 1 or 2 weeks later usually makes the diagnosis clear. Pregnancy diagnosis has the following goals:

- To determine whether the patient is pregnant
- To estimate the duration of pregnancy in weeks as accurately as possible
- To detect any sign of ectopic pregnancy or abnormal pregnancy

STEPS IN CLINICAL EVALUATION

The very first exam gives the most reliable estimate of pregnancy duration. Try to be exact. This information may be important later if a decision about inducing labor is necessary. Write down the dates of the patient's last few menstrual periods and record her current pregnancy symptoms, the date they began, and the date of your examination. Carefully evaluate and record the size of the uterus (in weeks) and the estimated date of confinement (EDC) after the first exam. Use both symptom history and your exam to determine EDC.

Symptoms and history

Most patients first notice symptoms of pregnancy about 4 weeks after the last menstrual period. The first sign is usually sensitivity of the nipples, which may soon be followed by breast tenderness. These symptoms can begin just before the menstrual period is due or during the first week or two after the period is missed. During the first 4 to 12 weeks of pregnancy, other signs may appear:

Missed periods	Weight gain
Breast tenderness or swelling	Mood changes
Nausea (morning sickness)	Fatigue
Urinary frequency	Change in appetite or eating habits
Feeling warmer than usual	Change in dreams (more vivid)

Symptoms of nausea, breast tenderness, and fatigue are usually most intense between 6 and 10 weeks of pregnancy, when pregnancy hormone levels are at their peak. By the 12th week, these symptoms usually subside, and new signs appear:²

- Increase in breast size
- Blotches of pigment on face (pregnancy mask; chloasma)
- Protruding lower abdomen
- Darkening of nipples
- Vaginal discharge (wet mucus)
- Fluttering fetal movements (15 to 16 wks)
- Fetal movements and kicks (18 to 20 wks)
- Swelling and redness of gums
- Leg cramps

Physical examination

The first signs of pregnancy include a slight softness of the uterus and a sense of increased flexibility at the junction between the cervix, which remains more firm, and the body of the uterus, which is softer than normal. These signs are subtle and may give a hint of pregnancy as early as 4 or 5 weeks after the last menstrual period. Often, one ovary is slightly tender and prominent because of the active corpus

luteum cyst that is supplying hormones for the first few weeks of pregnancy. The woman's breasts may also seem slightly swollen and may be more tender than usual on examination.

By 6 weeks of pregnancy, the uterus should definitely feel soft and just barely enlarged, so you can be quite certain about the diagnosis of pregnancy. By 8 weeks, the uterus has enlarged to the size of a small plum and begins to have a definitely rounded shape; the body of the uterus feels like a bulge that begins at the junction with the cervix. You may also notice that the woman's thyroid gland is more prominent than usual and that her nipples are beginning to darken or become more prominent.

VERIFYING THAT A PATIENT IS NOT PREGNANT

There is no way to be absolutely certain a patient is not pregnant. Even a Sensitive Urine Test Kit cannot detect early pregnancy until implantation is completed about 7 days after ovulation, and the patient's history can be misleading. Even visible vaginal bleeding does not provide infallible assurance: bleeding can occur during early pregnancy and may even signal pregnancy problems such as threatened abortion. Still, it is possible to be reasonably sure about pregnancy if you take a careful history and perform an appropriate exam. Pregnancy is *not* likely under the following circumstances:

1. The woman has had a regular pattern of monthly menstrual periods and meets one of the following conditions:
 - She has not had sexual intercourse since her last menstrual period.
 - She has used an effective contraceptive method correctly and consistently.
 - She has had a normal menstrual period within the last 7 days.
2. The woman has been pregnant and meets one of the following conditions:
 - She had an abortion within the last 7 days.
 - She delivered a full-term pregnancy within the last 4 weeks.

3. The woman is fully breastfeeding and meets one of the following conditions:
 - She delivered within the last 8 weeks.
 - She delivered within the last 6 months and has not yet resumed menstrual bleeding.

Bleeding during the first 2 months after delivery is considered postpartum bleeding, and is normal. After 2 months, when bleeding resumes it indicates that the interval of lactational amenorrhea has ended and potentially fertile menstrual cycles are returning. Lactational amenorrhea provides effective contraceptive protection during the first 6 months if the woman breastfeeds fully⁵ (the infant receives breast milk exclusively or almost exclusively, day and night, with only occasional tastes of water or food). A woman who does not breastfeed after delivery may resume fertile menstrual cycles as soon as 4 to 6 weeks after delivery. (See Chapter 12 on Lactation and Postpartum Contraception.)

Evaluating the possibility of pregnancy in a woman who does not have regular menstrual cycles can be confusing. If the patient's history is not clear or if you are not certain about how reliable the information is, it may be prudent to wait so that you can document the events of the next menstrual cycle. An exam at the time of ovulation can verify ovulatory mucus. If a microscope is available, you can check for mucus that dries in a crystal fern pattern (called *spinnbarkeit*). The next normal menstrual period should begin 13 or 14 days later. If it begins on the expected date, you can be quite certain the woman is not pregnant. Be sure the woman uses an effective contraceptive method or is able to avoid intercourse during this interval. Alternatively, a Sensitive Urine Test Kit can be used to help provide reassurance.

MANAGING PREGNANCY PROBLEMS

Sometimes it is not possible to reach a definite diagnosis during the first exam. The most common reason for uncertainty is very early pregnancy—an exam 1 week later, when signs and symptoms are clearer, may solve the problem. Abnormal pregnancies can also cause confusing signs and exam findings. The following discussion presents some of the more common or serious problems.

Bleeding in Pregnancy

Bleeding in early pregnancy is common. Sometimes bleeding is the first sign of a problem, but it can also occur in a completely normal pregnancy. A woman who has a normal pregnancy may report an episode of bleeding that seems like a normal menstrual period, or she may have had bleeding that is lighter or shorter than normal or at not quite the correct time. In this situation, the woman's uterus will be about 4 weeks larger than you would expect from her last bleeding date. Other causes for a larger than expected uterus are shown in Table 9:1.

Table 9:1 Reasons for a difference between size of the uterus and period dates

Uterus smaller than expected	Uterus larger than expected
Fertilization later than dates suggest (ovulation was delayed)	Fertilization earlier than dates suggest (pregnancy began before last "period")
Spontaneous abortion: threatened	Uterine leiomyomata (fibroids)
Incomplete, or missed abortion	Twin pregnancy
Incomplete abortion procedure	Abnormal uterus (such as bicornuate)
Ectopic pregnancy	Molar (hydatidiform) pregnancy

Bleeding can also be a sign of problems such as ectopic pregnancy or threatened spontaneous abortion (miscarriage). In these situations, the uterus is usually smaller than you would expect from the date of the woman's last period. The bleeding pattern with both these problems tends to be more persistent than the "false period" bleeding in normal pregnancy.

Ectopic pregnancy

Of all the pregnancy problems, ectopic pregnancy is the most important to keep in mind, because emergency treatment may be needed. Internal hemorrhage from ectopic pregnancy is a leading cause of maternal death.

Vaginal bleeding associated with ectopic pregnancy may not be very heavy and may be intermittent. The woman may have pregnancy symptoms such as breast tenderness or nausea, but these tend to be less intense than during a normal pregnancy, and she may have no clear symptoms at all. She may also have abdominal pain, especially if the pregnancy has progressed to 6 weeks or more.

Pain may be one-sided, or it may be more generalized in the lower abdomen; once pain has started, it tends to be persistent and does not usually have the crampy, intermittent pattern that is common with uterine cramps or contractions caused by spontaneous abortion. The uterus is likely to be smaller than last period dates would suggest, and there may be tenderness in the area of the fallopian tube during exam. In some cases, the ectopic pregnancy may be palpable as a mass in the area of the fallopian tube or ovary.

Table 9:2 Risk factors for ectopic pregnancy

History of prior ectopic pregnancy
History of prior pelvic inflammatory disease (PID)
History of gonorrhea or chlamydia
History of appendicitis
History of prior abdominal surgery or pelvic surgery
Bleeding or spotting during early pregnancy
Uterus smaller or firmer than last menstrual period date suggests
Became pregnant while using an intrauterine devices (IUD), progestin-only pills, or progestin implants
Became pregnant after tubal sterilization
Became pregnant despite using emergency postcoital pills
Abdominal pain or tenderness on one side or throughout lower abdomen

As the pregnancy progresses to 7 weeks of gestation or more, internal bleeding or rupture becomes more and more likely. Internal bleeding causes severe pain, with abdominal muscle guarding and rebound tenderness when the abdomen is palpated. As blood inside the abdominal cavity is irritating to the bowel, bowel sounds may be

diminished or absent, and vomiting may occur. Irritation of the diaphragm may also cause shoulder pain. Internal hemorrhage also causes hypotension and a drop in blood count, and it can lead rapidly to death.

Diagnosing an ectopic pregnancy early is tricky. Early suspicion is very important. There may be few, if any, definite signs of pregnancy,² and a slide pregnancy test (2-minute agglutination test) is likely to be negative,³ because the pregnancy hormone levels are lower than normal in most cases of ectopic pregnancy. Be alert, especially if the woman has one or more risk factors for ectopic pregnancy (see Table 9:2). If ectopic pregnancy is a possibility, make sure the woman understands the danger signs shown in Table 9:3. Frequent, careful follow-up, with daily exams, may be needed until the diagnosis is clear. If the woman has symptoms that strongly suggest ectopic pregnancy, every effort should be made to arrange for further evaluation. Culdocentesis, to aspirate fluid from the abdominal cul-de-sac, may show that internal abdominal bleeding is occurring. If available, a sensitive pregnancy test and ultrasound evaluation may be helpful. Signs like hypotension or a dropping blood count, however, mean there is no time for delay; immediate surgery can be lifesaving.

Table 9:3 Early pregnancy danger signs

See your clinician immediately if you develop any of these signs!

Possible Ectopic Pregnancy

- Sudden intense pain, persistent pain, or cramping in the lower abdomen, usually beginning on only one side or the other
- Irregular bleeding or spotting with abdominal pain when period is late or after an abnormally light period
- Fainting or dizziness persisting more than a few seconds, which may be a sign of internal bleeding (internal bleeding is not always associated with vaginal bleeding)

Possible Miscarriage

- Last period was late and the bleeding is now heavy, possibly with clots or clumps of tissue. Cramping is more severe than usual
 - Period is prolonged and heavy: 5 to 7 days of heaviest bleeding
 - Abdominal pain or fever
-

ABORTION

Bleeding associated with a spontaneous abortion may be heavy with clots; the woman may have cramping. The cervix may appear partly dilated. In some cases, clots and tissue visibly protrude from the cervical os. Bleeding can be heavy enough to cause anemia. Immediate referral for surgery (vacuum aspiration) may be needed to remove remaining pregnancy tissue and stop hemorrhage. Because the risk of serious infection is high with incomplete abortion, if you suspect retained tissue, it would be wise to perform a vacuum aspiration of the uterine contents. There may be retained tissue after incomplete spontaneous abortion or after an attempted abortion procedure. The woman with retained tissue is likely to have persistent bleeding and cramping, and she may develop signs of infection such as severe uterine tenderness, increasing abdominal pain, fever, and malaise. The vaginal secretions and blood may appear cloudy and abnormal, with a slightly sweet or foul odor. Immediate, intensive treatment for infection and vacuum aspiration are necessary when infection is suspected.⁴ Be especially careful if there is any question of trauma or you suspect that an abortion procedure may have been attempted.

When the spontaneous abortion is complete, uterine bleeding subsides to a light flow and cramping stops, usually within a few hours. Pregnancy symptoms also subside promptly, and the uterus feels firm and non-tender during the pelvic exam. If the woman has no further bleeding and cramping episodes, feels well, and has no fever, she may not require any treatment. Schedule a follow-up exam after a few days to verify that the uterus is returning to normal size.

Other confusing situations

A missed abortion can present confusing signs and symptoms.⁴ If the fetus stops growing, the uterus will be smaller than the woman's period dates suggest it should be. On a follow-up exam, the uterus will not have grown. If ultrasound or quantitative blood pregnancy tests are available, it may be possible to make a definite diagnosis. Otherwise, it may be quite difficult to be certain about what is happening. It is possible that a non-viable pregnancy could remain in place for weeks or even months before a spontaneous abortion begins.

If the woman's uterus is larger than menstrual dates suggest, consider the possibility of a twin pregnancy, a uterine leiomyomata (fibroids), or a uterine abnormality such as bicornuate (two-horn) uterus. If the rate of growth is very rapid and significantly larger than it should be, consider trophoblastic disease (molar or hydatidiform pregnancy). As pregnancy hormone levels are very high with trophoblastic disease, a woman with this disorder is also likely to have pregnancy symptoms, such as nausea, that are more intense than average. Bleeding can also occur with trophoblastic disease.

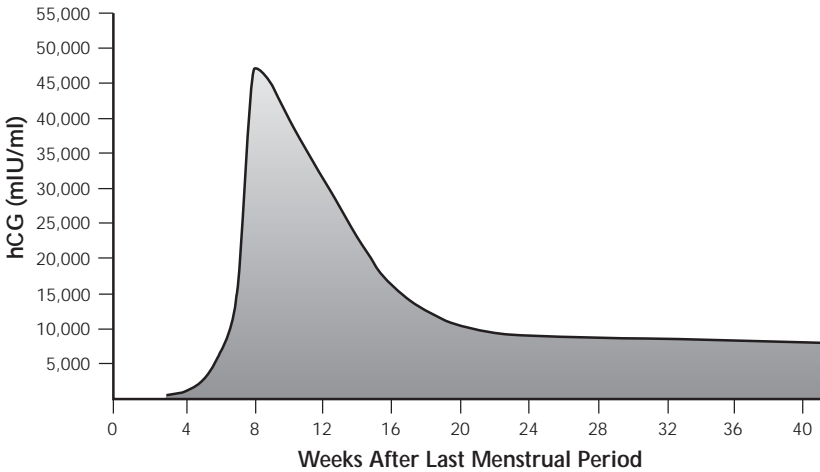
USING PREGNANCY TESTS

Pregnancy tests detect human chorionic gonadotropin (hCG) in a pregnant woman's urine or serum. This hormone is produced by placenta cells and first appears at very low levels soon after implantation, which occurs about 7 days after ovulation. hCG production rapidly increases, doubling approximately every 2 days. When the woman's first missed period is due, the serum level of hCG has reached 50 to 250 mIU/ml and can be detected by sensitive pregnancy tests. When she is 6 weeks pregnant, the level is high enough (several thousand mIU) to be detected by all commonly used pregnancy tests.

Pregnancy hormone levels peak at 8 to 10 weeks of pregnancy, then decline to a lower, steady level until the end of pregnancy (see Figure 9:2). This explains why symptoms caused by hCG, such as nausea and fatigue, are usually most intense during the second month of pregnancy.

Pregnancy hormone production is often abnormally low in ectopic pregnancy and in spontaneous abortion. In these situations, a slide pregnancy test (2-minute agglutination test) is likely to be negative even though the woman is pregnant. The hormone level is simply too low to detect unless a sensitive pregnancy test is available. Abnormally high hormone levels can be caused by twin pregnancy and trophoblastic (molar) pregnancy.

Figure 9:2 hCG levels during normal pregnancy



Source: Braunstein et al. (1976) with permission.

After pregnancy, the source of hormone production in the placenta is gone, and hormone in the bloodstream is gradually cleared. Because the level will have dropped to less than 50 mIU/ml 2 weeks after a full-term pregnancy, even a sensitive pregnancy test will no longer be positive at that time. When abortion occurs during the first 3 months of pregnancy, however, the starting level of hCG is very high. In this case, the level may still be high enough 2 weeks later to cause the pregnancy test to remain positive. Even a sensitive test should be negative, however, within about 40 days or so after a first-trimester abortion.

HOW PREGNANCY TESTS WORK

There are several different kinds of pregnancy tests. Because they differ in sensitivity and design, interpreting positive and negative results will not be the same for all tests.

Slide Pregnancy Test (2-minute agglutination test)

This test can detect pregnancy when the hCG hormone level is 1,500 mIU/ml or higher, which occurs at about 6 weeks of pregnancy. Slide tests involve mixing a drop of the patient's urine with a drop of test solution that contains antibody. If the patient's urine contains hCG hormone, it binds with the anti-hCG antibody in the test solution. Binding of the test antibody prevents clumping (agglutination) of latex particles in a second test solution, which is poured onto a slide. If the woman is pregnant, the second solution does not clump. If clumping occurs, it means the test is negative. (Note: some slide tests work by direct clumping, where the results are reversed; be sure to read the directions with your kit carefully before performing a test.)

Incorrect results can occur if the woman has protein in her urine or abnormally high levels of certain other hormones. These include luteinizing hormone (LH), which is high at ovulation, thyroid stimulating hormone (TSH), which is elevated because of hypothyroidism, or follicle stimulating hormone (FSH), which is elevated after menopause. Because these hormones can cross-react with antibodies in the slide-test solution, the test can show a positive result even though the woman is not pregnant. On the other hand, certain medications, as well as urine that is too dilute, can cause a negative test result even though the woman is pregnant. The test is most likely to be positive if the urine used is the first the woman voids in the morning.

Slide agglutination tests are easy to store and use and are relatively inexpensive. The information they provide, however, does not add much to clinical management because a clinical history and a physical exam can also provide an accurate diagnosis by the 6th week of a normal pregnancy. Because slide agglutination tests cannot detect a low hormone level, this test is not reliable in diagnosing ectopic pregnancy and is not helpful in verifying pregnancy prior to IUD insertion or other medical treatment that should be avoided in pregnancy.

Sensitive Urine Pregnancy Test Kits

These tests can detect pregnancy when the hCG level is 50 mIU/ml or higher, which occurs within about 10 days after ovulation (some kits are even more sensitive). Sensitive kits use two antibodies to link hCG hormone in the woman's urine to an enzyme that changes color.

Sensitive kits are easy to use, but they are more expensive than slide tests and not as easy to store. They are reliable, however, for diagnosing ectopic pregnancy and for verifying that a woman is not pregnant prior to biopsy, x-ray, IUD insertion, or medical treatment that should be avoided in pregnancy.

False results are not common with sensitive urine pregnancy test kits, and cross-reaction with other hormones is not a problem.

Intermediate Sensitivity Tube Tests

Tube tests based on agglutination that are similar to the slide test are available to detect hCG levels of about 200 to 1000 mIU/ml. They are somewhat more expensive than slide agglutination tests but not as easy to use, and they may require more time to perform. Depending on availability and cost, however, tube tests may be a useful alternative to the Sensitive Urine Test Kits described above, but not quite as sensitive.

Blood Pregnancy Tests

A quantitative blood (serum) test can be used to measure the exact level of hCG; this test can accurately detect levels of hCG as low as 5 mIU/ml. Called Quantitative Beta-hCG assay, this test can help identify a non-viable pregnancy such as missed abortion or trophoblastic (molar) pregnancy. Sequential hCG levels may also help diagnose ectopic pregnancy.

Quantitative Beta-hCG assays, like radioimmunoassays and radioreceptorassays, require sophisticated laboratory facilities and do not provide immediate results. When a simple yes or no (positive or negative) answer is the goal and Sensitive Urine Kits or Tube Tests are available, more costly blood tests do not have any clinical advantages.

PRIORITY SITUATIONS FOR PREGNANCY TESTING

In most cases, pregnancy test results do not make a crucial difference in clinical management. There are some situations, however, when having a pregnancy test available can be very helpful:

1. **To distinguish between pelvic infection and ectopic pregnancy.** The early symptoms of a pelvic infection and an ectopic pregnancy can be very similar: abnormal bleeding, pelvic and abdominal pain, abdominal tenderness and guarding, and uterine and adnexal tenderness. As the problem progresses, signs of internal hemorrhage that indicate ectopic pregnancy, or significant fever and sepsis that indicate an infection is present are likely to develop. Making the correct diagnosis as soon as possible may be a matter of life and death. Having a Sensitive Urine Test Kit available to diagnose ectopic pregnancy quickly and early could save a woman's life.
2. **To avoid unnecessary vacuum aspiration surgery.** Symptoms of incomplete abortion can be similar to symptoms of early pelvic infection or of spontaneous degeneration of a uterine leiomyoma (fibroid). If the woman has not passed recognizable tissue and if pregnancy has not been diagnosed prior to the onset of signs associated with a spontaneous abortion, distinguishing incomplete abortion from these problems may be tricky. If a Sensitive Urine Test Kit result is negative, incomplete abortion is not likely and vacuum aspiration surgery can be avoided.
3. **To confirm pregnancy problems.** Pregnancy testing may be helpful when a patient is referred for an evaluation of rare pregnancy problems. A quantitative Beta-hCG level, or two quantitative Beta-hCG tests obtained several days apart, can confirm diagnosis of trophoblastic (molar) pregnancy or an abnormal or non-viable pregnancy. Alternatively, an ultrasound evaluation can be used to help diagnose rare problems.
4. **To avoid unsafe or unneeded abortion surgery.** Routinely performing a Slide Urine Test (2-minute agglutination) before planned abortion is reasonable. A negative result

shows that the pregnancy hormone level is below 1500 mIU/ml, which means that the woman is either not pregnant or has been pregnant for less than 6 weeks. If the woman is not pregnant, an unnecessary procedure is avoided.

AVOIDING PREGNANCY TEST INTERPRETATION ERRORS

Sometimes, the results of a pregnancy test do not agree with other clinical signs:

1. **Any test can be wrong.** Laboratory error is always possible. Specimens could be mixed up, or there could be a problem in performing the test. It is essential to follow kit instructions precisely and time the steps carefully. Be sure to follow recommendations for storage; respect kit expiration dates.
2. **Know the test being used.** Interpreting results depends on understanding both the sensitivity of the test and what it will and will not detect.
3. **False results are common with slide agglutination tests.** A slide test is likely to be negative, even though the woman is pregnant, if the test is performed either too early or too late (after about 16 to 20 weeks, when the hCG hormone level has dropped). Results can also be negative with an ectopic pregnancy, threatened or missed abortion, or when the woman is pregnant but her urine is too dilute. Protein or blood in the urine could cause a positive test when the woman is not pregnant, as could a cross reaction with thyroid or menopause hormones.
4. **False results are not common with Sensitive Urine Test Kits.** A false result could occur if this sensitive test is performed incorrectly. For example, there could be excessive rinsing or the person performing the test could have red-green color blindness. Unusual medical problems such as severe kidney disease or cancer can also cause a false result.

COUNSELING AND PATIENT INSTRUCTIONS FOR OPTIMAL PREGNANCY

Often, a visit for diagnosing pregnancy provides an important opportunity for patient education and family planning counseling. If the patient is pregnant, precautions for pregnancy can be reviewed and arrangements made for prenatal care. The importance of diet, including adequate intake of folic acid (0.4 mg daily) and calcium (at least 1,500 mg daily), needs to be stressed, as well as the importance of avoiding alcohol⁶ and other potentially toxic exposures. If the patient is not pregnant but would like to be, she may need information to maximize her chance for fertility. Because she is not pregnant, this will be a good opportunity to begin planning for optimal pregnancy. If the visit is a pregnancy “scare”—the patient is not pregnant and does not want to become pregnant—this is an ideal time for her to learn about and to initiate effective contraception.

INSTRUCTIONS FOR OPTIMAL PREGNANCY

1. Think about medical risk factors (your own, your partner's, and both your families) that may affect pregnancy. You may want to talk to a physician if either family has hereditary problems such as sickle cell anemia or Tay-Sachs disease. If you have any serious medical condition or take medication for any reason, talk to your health provider before you become pregnant. Your medications may need to be changed to avoid problems in pregnancy, and you will want to be sure any medical conditions you have are under control. This is especially important for problems like diabetes or tuberculosis.
2. Be sure your diet is as good as it can be, and take a daily vitamin supplement if possible. Ideally, start several months before you become pregnant. Pregnancy can deplete important vitamins and minerals like iron and calcium, so you will need to be sure to get plenty of good nutrition. The vitamin folic acid, 0.4 mg daily, is specifically recommended to reduce the chance of spinal defects in your baby.

3. Avoid exposure to potentially toxic agents. Do not drink alcohol, do not smoke, and do not use any illegal drugs. Avoid excessive caffeine, and avoid x-rays of the abdominal area.
4. Try to avoid being exposed to a sexually transmitted infection. Avoid intercourse or use condoms if you have any chance at all of being exposed to a sexually transmitted infection. Infections such as herpes, gonorrhea, chlamydia, or syphilis can cause serious or deadly complications in your baby.
5. Try to avoid being exposed to contagious illnesses. Fever can cause problems in pregnancy; try to avoid contact with people with contagious diseases, such as influenza.
6. Avoid contact with animal feces. Toxoplasma infection is transmitted through cat feces, and other animals carry infectious organisms as well. Do not handle feces during pregnancy. If possible, wear gloves when working with soil, and afterward wash your hands with soap and clean water.
7. See your health provider as soon as possible if you think you may be pregnant. Having your first pregnancy exam early will help in getting accurate dates for your pregnancy. If possible, schedule your exam within 2 weeks after missing your period.
8. Watch for the danger signs of possible pregnancy problems. Signs of pregnancy problems like ectopic pregnancy (which is also called tubal pregnancy) and miscarriage are likely to occur during the first month or two of pregnancy. Remember the danger signs and contact your health provider right away.

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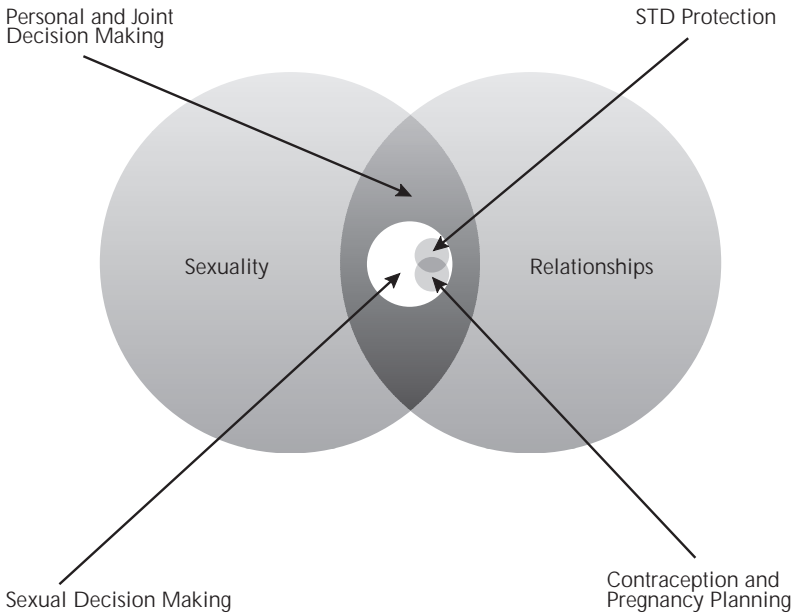
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Sexuality and Reproductive Health

Nonke came many times to the family planning clinic. She asked questions about the contraceptive she used. She did not ask why she had pain when her husband entered her during their lovemaking. She was embarrassed to bring up such matters. Yet she desperately wanted to do something so she could give her husband more satisfaction and so she too could experience the pleasure she heard her friends mention.

Contraception is a significant part, but still only a part, of family planning. Family planning, in turn, is a very small part of sexuality (see Figure 10:1). Family planning practitioners have a unique opportunity to supply sexual counseling services to patients who might have no other readily available resource for help.

Figure 10:1 Sexuality, family planning, and safer sex



TAKING A BRIEF SEXUAL HISTORY

If you have time to ask only one question of each patient, a reasonable choice might be:

What do you do to protect yourself from AIDS?

The patient who responds, "Who, me?" can be encouraged to look closely at whether there is any risk for sexually transmitted infection (STI) in her or his present or past sexual relations. The patient who says, "I use condoms every time I have sex" can be praised, reinforced on correct condom use, advised about where to get free or inexpensive condoms, and reminded that condoms sometimes slip off or break.

If you have 2 to 5 minutes, ask these 10 questions to get a basic history:

1. Have you had a sexual experience with another person in the past year?
2. (If yes to question 1) With how many different people? One? Two or three? Four to 10? More than 10?
3. (If yes to question 1) In this past year, have you had sex with men, with women, or with both?
4. Can you tell me about your sexual life before this last year?
5. Have you ever had a sexually transmitted infection of any kind?
6. Have you ever shared needle or injection equipment with another person for any reason?
7. Have you ever felt for any reason that a sex partner put you at risk of infection?
8. What do you do to protect yourself from AIDS?
9. What do you do to protect yourself from unplanned pregnancy?
10. Is there anything else about your sexual lifestyle I need to know to take the best possible care of you?

If you have longer than 5 minutes, add questions about specific sexual practices, gynecological problems related to sexual function, relationships, alcohol and drug use, and sexual dysfunction.

It is appropriate to allow patients to defer the sexual history until a later visit or to decline to discuss sexual issues altogether. Once you have expressed your view that the sexual history is a normal and valuable part of the health history for all people, the patient will decide whether to respond.

THE PLISSIT COUNSELING MODEL

The PLISSIT counseling model was developed for health care workers who are not psychiatrists, psychologists, or sexual therapists but who wish to address the sexual needs and concerns of their patients and make appropriate referrals when necessary.¹ It consists of four stages: Permission giving, Limited Information giving, Specific Suggestions, and Intensive Therapy.

Permission giving is telling the patient that being sexual in his or her own way is acceptable. Permission giving from a knowledgeable professional figure is quite powerful. However, health care workers are not required to give permission for thoughts, feelings or behaviors that violate their own professional value system. Furthermore, professionals ought not approve of behaviors that threaten the physical or psychological health of patients and their partners.

Limited information giving usually involves discussing anatomy and physiology as well as dispelling myths about sex.

Specific suggestions involve skill-building such as changing position for intercourse and other activities, using lubricants, or using a squeeze or stop-start technique.

Intensive therapy will probably prove too time-consuming and involved for all but those who are specially trained and wish to devote considerable time to such work. Intensive therapy may be necessary for body image problems, relationship problems, identity issues, depression, personality disorders, or psychoses.

HUMAN SEXUAL PHYSIOLOGY

Sexual arousal may be caused by a dream, a fantasy, a memory, or any of the five senses: taste, smell, sight, sound, or touch. Couples can enjoy a wide range of intimate sexual expressions—from holding hands, hugging, kissing, massage, and dancing to petting, mutual masturbation, anal stimulation, oral-genital sex, and so on. Sexual practices vary from

individual to individual and from culture to culture. One common factor can be found in all these expressions: *touching*. People need touching for nurture, for solace, for expressing simple affection, for communicating, and for sexual gratification. This chapter does not describe specific sexual practices but discusses the physiology of the sexual response, the contraceptive's effect on that response, and information for counseling couples on sexual dysfunctions. Researchers describe four physiological stages of sexual response as listed in Table 10:1.

One significant difference between men and women has to do with the ease of attaining multiple orgasms during a single sexual episode. Women are physiologically capable of moving between plateau and orgasm one or several times.

Men have a refractory period that follows ejaculation. During the refractory period, they have difficulty achieving a second erection, and after they attain an erection, it may be difficult to have orgasm and ejaculate. The length of the refractory period gradually increases as men grow older. It may be only 5 to 15 minutes in an 18-year-old, but by the age of 60, the refractory period may be 18 to 24 hours. The length of the refractory period varies widely. In general, the more frequently a man ejaculates, the shorter his refractory period.

FEMALE RESPONSE AND SENSITIVITY

Virtually any portion of a woman's skin may give pleasurable and exciting sensations when caressed, providing she is willing and not distracted. Women vary greatly in what sort of stimulus produces orgasm. It is common to find healthy, normal women who are orgasmic by some means but are not orgasmic with penile-vaginal thrusting alone. However, regardless of the method by which they are produced, orgasms are physiologically identical, except perhaps in duration.

Table 10:1 Stages of sexual response

Stage	Sexual Response
Excitement	<i>Males:</i> Pelvic engorgement, erection. <i>Females:</i> Lubrication and dilation of the upper vaginal canal. Both men and women have increased muscle tension, increased heart and respiratory rate, and increased blood pressure. The focus of attention becomes more centered on sexual matters.
Plateau	Sustained engorgement, muscle tension, elevated heart and respiratory rates, and elevated blood pressure for a period that may last from minutes to hours.
Orgasm	Rhythmic contractions of pelvic voluntary and involuntary musculature in both sexes. In men, this action can result in ejaculation of semen. Orgasm is a beginning of relief from tension.
Resolution	Gradual loss of muscle tension, progressive relaxation, and often a sense of drowsiness and contentment. Blood vessels open to drain pelvic and genital engorgement, and gradually (usually over a period of minutes) the individual returns to a nonexcited state.

Source: Masters and Johnson (1966)

Breast and nipple sensitivity tends to be high in most women, but some women do not find breast caressing particularly arousing. For most women whose genitals are intact, the glans and shaft of the clitoris, the inner surfaces of the labia minora, and the first inch and a half of the vagina are the most sexually sensitive areas of all. Indeed, the clitoral head (glans) may be so sensitive that direct touch is sometimes or always uncomfortable. Some women have an area of sexual sensitivity beneath the anterior wall of the vagina about halfway from the hymenal ring to the vaginal vault. (Genital mutilation or circumcision can interfere greatly with these physiological sensations and can

leave a woman with little or no feeling or with painful sensations.) Women may respond sexually to anal stimulation.

Ejaculation of fluid from the urethra at orgasm should be regarded as a normal female sexual response and not as urinary incontinence. Usually, a folded bath towel under the woman's hips is sufficient to keep sheets and bedclothes from becoming dampened. The source and function of this sexual event remain poorly understood.

MALE RESPONSE AND SENSITIVITY

Men tend to find genital sexual stimulation more intense than whole-body touch arousal. Nipple stimulation may be as arousing for men as it is for women. The genital sites of highly pleasurable sensitivity (in order of decreasing response to touch) are as follows:

- Area of frenular attachment on ventral surface of penis, just behind the glans
- Coronal ridge of glans
- Urethral meatus
- Shaft of the penis
- Penile base, which is located within the perineal area between the area of scrotal attachment and the anus
- Scrotum and testicles (gentle manipulation only)
- Perianal skin

EFFECTS OF CONTRACEPTION AND SAFER SEX ON SEXUAL FUNCTION

The family planning provider should remember that contraception and sexual practices can influence the client's ability to function sexually. Generally, candid communication can help the client avoid or overcome many negative influences.

FEAR OF INFECTION

Worry about human immunodeficiency virus (HIV), genital warts, and other incurable viral sexually transmitted infections often affects a couple's sexual experience. The clinician's task is to help patients at risk for these infections to keep sex pleasurable and infection free.

FEAR OF PREGNANCY AND INFERTILITY

For men, the subject of pregnancy may cause concern, but their level of concern tends to be lower than that for women. Among women, feelings about pregnancy have an impact that men generally do not feel. For couples trying to conceive, instructions to have intercourse around ovulation can be stressful for both partners. The fear of an unintended pregnancy can decrease an individual's enjoyment.

LACTATION

Reassure patients about the naturalness of sexual feelings associated with breasts. In cultures where the breast is considered an erotic object, some new fathers may be confused about their feelings about their partner's breasts while milk flows from them. Some fathers wrongly fear that intercourse will spoil the mother's milk.

COMBINED ORAL CONTRACEPTIVES

Decreased sex drive is an occasional side effect of oral contraceptives. Patients with this symptom will frequently report it. However, young women who are virgins may not realize that their desire is affected by the pill. Another concern is that couples who use the pill may be reluctant to interrupt lovemaking to add condoms or other methods for STI protection.

DIAPHRAGMS AND OTHER VAGINAL BARRIERS

Some women who request diaphragms may initially feel uncomfortable about inserting the device. A poorly fitted diaphragm may cause discomfort and thus inhibit sexual enjoyment. A diaphragm that is too large may press too hard against the tissues; one that is too small may become dislodged when the vagina expands during sexual excitement. The extra lubrication these products supply is pleasant for some couples and a messy interference for others.

CONDOMS

Some men lose their erection rapidly after ejaculation, and others maintain a relatively erect penis for some time. All men should hold the rim of the condom at the base of the penis as they withdraw to prevent the condom from slipping off. For couples with any STI risk, a condom should be put on *before* the penis comes in contact with the vagina, anus, or mouth, even before ejaculation is pending.

COITUS INTERRUPTUS (WITHDRAWAL)

Withdrawal requires the man to do the opposite from his usual desire (*i.e.*, he must pull out and move away from his partner when his desire is to push deeper, clasp, and hold more firmly). This method may leave some women without orgasmic relief. The couple should make a special effort to continue sexual play after withdrawal to make sure both partners have achieved gratification and relief of sexual tension.

Semen remains on the penis after ejaculation. Thus, the man should not put his penis back into the vagina until he cleans his penis and also urinates to flush out the urethra.

ABSTINENCE

Couples may achieve satisfaction with sexual abstinence as long as both select this alternative as the one that most closely meets their

individual needs. However, the couple practicing sexual abstinence may lose a major method of nonverbal communication in their relationship and may find it difficult to compensate by communicating in less intimate ways. They must make special efforts to maintain or strengthen other forms of communication.

FEMALE AND MALE SEXUAL DYSFUNCTIONS

When anything occurs to distract a person from excitement, then erection (in men), lubrication (in women), and orgasm or ejaculation may be impeded. Medications that affect the autonomic nervous system or have a sedative effect may cause a change in sexual function.

LOSS OF DESIRE

Loss of desire may follow previous experiences that have caused embarrassment, pain, or inadequacy. Other important reasons for losing desire include the following:

- Estrogen deficiency with secondary vaginal atrophy (whether postsurgical or postmenopausal) commonly leads to dyspareunia, which is painful penis-in-vagina intercourse. This condition often can be treated successfully with topical or systemic estrogen therapy.
- Birth control pills may diminish desire in some women, but diminished desire in pill users is more often associated with psychological factors (depression, grief, suppressed anger, etc.).
- Chronic fatigue affects both male and female sexual responsiveness. Any time a primary care-giving parent has a young child and complains of diminished responsiveness, then chronic fatigue should be considered as an important contributing factor.
- Debilitating diseases and conditions such as childbirth, surgery, cancer, chronic dieting, and excessive weight loss may

temporarily or permanently diminish desire and responsiveness.

- Medical disease may negatively affect sexual responsiveness. About half of female diabetics will eventually become anorgasmic. Organic pelvic or genital disease may lead to dyspareunia and eventual secondary loss of desire.

FEMALE SEXUAL DYSFUNCTIONS

Anorgasmia

Primary Anorgasmia. Some women are orgasmic during their first sexually exciting experience, and others never learn to have an orgasm. Women who have primary anorgasmia sometimes achieve a relatively low level of sexual excitement and may think of intercourse or other sexual activities as pleasant. They may get most of their reward from touching, holding, kissing, caressing, attention, and approval. However, women who regularly achieve high levels of sexual response without orgasmic release of tension may find the experience frustrating. Emotional irritability, restlessness, and pelvic pain or a heavy pelvic sensation may occur because of vascular engorgement.^{2,4}

Women who have not yet had an orgasm usually have some combination of the following:

- Sociocultural inhibitions that interfere with normal sexual response.
- A lack of knowledge about sex and sexuality, which interferes with normal sexual development.
- A lack of opportunity to practice in a safe, secure, socially acceptable, and private atmosphere (alone or in a relationship) in a situation that offers approval and support.
- A partner who ejaculates prematurely.
- A partner who has primary or secondary difficulty in achieving an erection.

- Genital mutilation (circumcision) that removes part or all of the clitoris, scars the genital area, or constricts the opening to the vagina. Often, vaginal intercourse is painful not only because of scarring from this procedure but also because of associated infection.

Secondary Anorgasmia. Secondary anorgasmia is the loss of ability to become orgasmic. The cause may be alcoholism, depression, grief, medication, illness, estrogen deprivation associated with menopause, or an event that has violated the patient's sexual value system.

Situational Anorgasmia. Women who are orgasmic in some situations may not be in others. A woman may have an orgasm from one type of stimulation but not from another. Or a woman may achieve orgasm with one partner but not another, or have an orgasm only under certain conditions or only with a certain type or amount of foreplay. These common variations are within the range of normal sexual expression.

Encourage a woman with situational anorgasmia to explore alone and with her partner those factors that may affect whether or not she is orgasmic, such as fatigue, emotional concerns, feeling pressured to have sex when she is not interested, or her partner's sexual dysfunction.

Family planners should consider recommending the female-above position for penile-vaginal intercourse, as it may allow for greater stimulation of the clitoris by the penis or symphysis pubis or both, and it allows the woman better control of movement. Bridging is the combining of a successful method for sexual stimulation with a desired technique so that the body learns to associate orgasm with that technique. If, for example, the woman is readily orgasmic with manual stimulation but not with penile-vaginal thrusting, she is encouraged to combine those two regularly until her body has learned to associate high levels of excitement and orgasm with penile-vaginal thrusting.

Random Anorgasmia. Some women are orgasmic but not in enough instances to satisfy their sense of what is appropriate or desirable. Often such women have trouble giving up control and allowing themselves to respond fully. Therapy can be aimed at helping them give up the need to keep their sexual feelings under control at all times.

Dyspareunia

Dyspareunia (painful intercourse) often can be resolved, even when long-standing, self-perpetuating pain is a factor. Clinicians should consider dyspareunia to be primarily a physical, rather than an emotional, problem until proven otherwise. In most instances of dyspareunia, there is an original physical cause. Among many African women, dyspareunia results from the damage caused by vaginal circumcision.

When pain occurs, the woman may be distracted from feeling pleasure and excitement. Both vaginal lubrication and vaginal dilation decrease. When the vagina is dry and undilated, penile thrusting is painful. Even after the original source of pain (a healing episiotomy, for example) has disappeared, a woman may feel pain simply because she expects pain. In brief, dyspareunia can be classified by the time elapsed since the woman first felt it:

- *During the first 2 weeks* or so, dyspareunia caused by penile insertion or movement of the penis in the vagina or by deep penetration is often due to disease or injury deep within the pelvis.
- *After the first 2 weeks* or so, the original cause of dyspareunia may still exist with the woman still experiencing the resultant pain. Or it may have disappeared, but the woman has anticipatory pain associated with a dry, tight vagina.

Dyspareunia is treated by the taking following steps:

- Carefully taking a history.
- Carefully examining the pelvis to duplicate as closely as possible the discomfort and to identify a site or source of the pelvic pain.
- Clearly explaining to the patient what has happened, including identifying the sites and causes of pain.
- Removing the source of pain when possible.
- Prescribing very large amounts of water-soluble sexual or surgical lubricant during intercourse. Discourage petroleum jelly. Moisturizing skin lotion may be recommended as an

alternative lubricant, unless the patient is using a condom or other latex product. Lubricant should be liberally applied (2 tablespoons full) to both the penis and vulva or introitus. A folded bath towel under the woman's hips helps prevent spillage on bedclothes.

- Instructing the woman to take the penis in her hand and control insertion herself rather than letting the man do it.
- Encouraging the couple to add pleasant, sexually exciting experiences to their regular interactions, such as bathing together (in which the primary goal is not cleanliness), mutual caressing without intercourse, and using sexual books and pictures. Such activities tend to increase both natural lubrication and vaginal dilation, both of which decrease friction and pain.
- Recommending a change in coital position to one admitting less penetration for women who have pain on deep penetration because of pelvic injury or disease:
 - Maximum penile penetration is achieved when the woman lies on her back with her pelvis rolled up off the bed, compressing her thighs tightly against her chest with her calves over the man's shoulders. Minimal penetration occurs when the woman lies on her back with her legs extended flat on the bed and close together while her partner's legs straddle hers.
 - If no vaginal penetration is tolerable, the couple may substitute interfemoral intercourse, in which the woman lies with her legs straight and her ankles locked (crossed). A triangular space between the upper thighs and vulva permits stimulation of both vulva and penis.

Vaginismus

Vaginismus is a painful or spastic contraction of a woman's pelvic floor muscles that occurs with attempted penetration of the vagina. Young women may be unable to begin having intercourse without pain.

Primary vaginismus. Vaginismus is commonly seen in the gynecological examining room among young women who appear afraid of their first pelvic examination. Rather than being uncooperative, such young women are actually suffering from a reflex they have not yet learned to control.

Secondary vaginismus. Vaginismus is sometimes a secondary process. A woman who had severe dyspareunia from some physical cause, such as the structural changes caused by female circumcision, may develop secondary vaginismus as a reflex. Women who have been raped, sexually abused, or examined by a rough clinician also may develop secondary vaginismus.

In general, women who have vaginismus are strongly motivated to change. Many of them can learn to break their cycle of spastic contractions even with one limited pelvic exam performed with extreme gentleness (including a one-fingered vaginal exam and omission of the rectal exam). Allow the woman to be in charge of the exam; do nothing without her knowledge and permission, and explain all parts of the examination in detail in advance. As the exam progresses, reassure the woman that her pelvic findings are normal (if they are normal). A partner can be counseled to show the woman the same degree of gentleness and communication.

Some women may require vaginal dilation as part of the treatment of vaginismus. The best vaginal dilator is the woman's own finger, which she can insert with the aid of a little lubricant.

MALE SEXUAL DYSFUNCTIONS

Rapid (Premature) Ejaculation

When ejaculation during intercourse occurs without any sense of voluntary control and within a minute or so of insertion of the penis, it may be termed rapid because the time available for sexual pleasure is quite limited for both people. Although a few men tend to ejaculate rapidly as a response to anxiety or stress, most men who ejaculate rapidly have done so consistently from their earliest experiences with a partner.

Erective Difficulty (Impotence)

Primary erectile difficulty (inability to sustain an erection sufficiently for insertion) is not common and usually has to do with high levels of anxiety about sexual performance.

Secondary erectile difficulty is quite common. Its cause may be psychological, but more likely it is due to organic disease or use of pharmacologic substances. In general, erectile loss caused by organic disease is persistent and progressively worsens. Men with this problem may lose sexual desire. In contrast, men whose erectile loss is primarily psychogenic sometimes have a history of acute onset with a specific precipitating event. Thereafter, the erectile loss does not occur on all occasions or with all partners. Night-time erections usually continue.

Organic Erectile Loss. Organic erectile loss is usually associated with one of four types of organic disease.

Testicular failure. In rare cases, sexual dysfunction is caused by testicular failure associated with low serum testosterone.

Endocrine disease. Diabetes mellitus is commonly associated with sexual dysfunction in three different circumstances:

- Diabetic men have the same sorts of psychogenic erectile loss as other men.
- Previously undiagnosed diabetics who are not in good metabolic control may experience dysfunction, but this condition is usually reversible with good metabolic control.
- Men with long-standing diabetes and diabetic neuropathy may develop erectile loss or loss of sexual responsiveness over time. This loss is usually not reversible, and these men may be candidates for a penile prosthesis.

Vascular disease. Any disease that obstructs arterial blood supply to the genitalia may affect erection.

Neurologic disease. Any lesion from the spinal cord to the genital innervation may interfere with erection, ejaculation, or both. A man may have suffered cord trauma, a cord tumor, multiple sclerosis, or

diabetic neuropathy; undergone surgical procedures; or have some other cause of this injury.

Generally debilitating disease. Debilitating diseases that affect a man's sexual function include cancer, chronic malnutrition, and starvation.

Pharmacologic Erective Loss. Other than alcohol (both acute intoxication and physical damage from chronic usage) and addictive drugs, three major kinds of pharmacologic agents are commonly associated with loss of desire, erection, ejaculation, or orgasm in men (and women):

- Antihypertensive therapy (including diuretics)
- Antidepressants and antipsychotic agents
- Anti-ulcer therapeutic agents (except simple antacids)

Any pharmacologic agent that affects the autonomic nervous system or has a potentially sedative effect may cause a change in sexual function. Because the change in function is often dose related, changing the type of medication or dose may relieve the loss in sexual function. Remember that alcohol or drug use is a common cause of both sexual dysfunction and problems with relationships.

Psychogenic Erective Loss. By the age of 40, many men have experienced one or more occasions in which they wished to have an erection but were not able to get one. A man tends to react to this experience in one of two ways. He feels some sadness and regret but does not worry unduly, or he views the situation with alarm and anxiety and suggests to himself that something in the apparatus is broken and, perhaps, it will never work properly again. On subsequent occasions, the man with the first reaction has little thought of the previous incapacity, whereas the man with the second reaction evaluates his performance repeatedly and, by so doing, rapidly distracts himself from feeling sexual excitement and pleasure.

When there is psychogenic erectile loss, encourage both partners to concentrate on sight, sound, smell, touch, and taste and to fill their minds with sensation rather than allowing themselves to become distracted by thinking. Performance anxiety can also be relieved by tem-

porarily forbidding the couple to insert the penis but instead encouraging them to practice touching, caressing, and kissing and to share other sensuous and erotic experiences. Under such circumstances, erection usually returns rapidly and intercourse can occur.

Ejaculatory Delay

Delayed ejaculation almost always occurs with vaginal or anal intercourse rather than with masturbation, unless this problem is related to medication or disease. It is often caused by performance anxiety, but it also may be a learned behavior (anger at partner, unilateral contraception decision, etc.) or may occur in a man who finds masturbation more stimulating than sexual activity with his partner.

Treatment begins with having a man masturbate to orgasm with his penis close to but not inside the vagina. For example, over a few days a man masturbates until he ejaculates on his partner's vulva, then progresses to ejaculating in the vagina.

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The Essentials of Contraception: Effectiveness, Safety, Noncontraceptive Benefits, and Personal Considerations

Family planning decisions should be made on a completely voluntary basis, but also on the basis of thoroughly informed choice on the part of individuals and couples. A decision about child-bearing cannot be called voluntary if individuals and couples have not been previously educated and informed about the meaning of family planning to their lives and the lives of their children and about the methods of family planning that are available.

— Dr. Fred T. Sai

Choosing a contraceptive is an important decision. A method that is not effective can lead to an unwanted pregnancy. A method that is not safe can cause medical problems. A method that does not fit a person's lifestyle is not likely to be used correctly or consistently. Users them-

selves should make the decision about their contraceptives. In making that decision, they need to consider the feelings and attitudes of their partners. Through counseling, you can help your client choose the most suitable contraceptive. You also can influence the user's motivation and ability to use the method correctly.⁷ Encourage clients to educate themselves about the various methods available.

Demographic and Health Surveys indicate that married women of reproductive age in Africa are less likely to use a method of family planning than are married women of reproductive age in other regions of the world. The percentage of married women at risk for pregnancy who report using a method of family planning ranges from 5% in Uganda to 75% in Mauritius. The percentage who report using a modern method ranges from only 1% in Mali to 49% in Mauritius.¹⁹ See Table 1:6 in Chapter 1 on Benefits of Family Planning.

The prevalence of contraceptive use is lowest among young women and highest among women in their late 20s through their 30s. Once women have two or three children, they are more likely to use a family planning method. Education also plays an important role in whether a woman will use a contraceptive method.

Most married women in Africa know about family planning. However, in Burundi, Ghana, Liberia, Mali, Niger, Senegal, and Uganda, fewer than 40% can spontaneously name any modern method of family planning.¹⁹

Contraceptive users may employ a variety of methods throughout their lives and should know enough to consider various contraceptive methods. The client's choice of a contraceptive depends on several major factors: effectiveness, safety, noncontraceptive benefits, and personal considerations.

EFFECTIVENESS: "WILL IT WORK?"

"Is the condom really effective?"

"Which would be the most effective method for me?"

"Why did one magazine say diaphragms are 98% effective and another say they're 80% effective?"

"Can you still get pregnant if you take your pills every day on schedule?"

"Will it work?" is the question usually asked first and most frequently about any contraceptive method. Because this question cannot be answered with certainty for any particular couple, most clinicians and counselors try to help clients understand something of the difficulty of quantifying efficacy.

It is useful to distinguish between measures of contraceptive effectiveness and measures of contraceptive failure. If 18% of women using the diaphragm became accidentally pregnant in their first year of use, that does not mean that the diaphragm is 82% effective. The actual percentage would be lower, because some of those women would not have become pregnant even if they had used no contraceptive. For example, if 90% would have become pregnant had they used no contraceptive, using the diaphragm reduced the number of unplanned pregnancies from 90% to 18%, a reduction of 80%. If only 60% of these women would have become pregnant if they did not use contraception, the diaphragm's true efficacy would be only 70%.

However, because no study can say how many women would have become pregnant had they not used the contraceptive, it is simply not possible to directly measure effectiveness. Thus, we can speak only of pregnancy rates—the proportion of users who became pregnant while using the contraceptive.

EFFICACY DURING TYPICAL AND PERFECT USE

Our current understanding of contraceptive efficacy is shown in Table 11:1. Because many of the studies on contraceptive efficacy have flaws, we can only estimate the risk of pregnancy. We provide estimated percentages for the following events:

1. Becoming pregnant during the first year for the *typical user* who may not always use the method consistently and correctly
2. Becoming pregnant during the first year for the *perfect user* (someone who uses the method consistently and correctly)
3. Continuing to use the method after 1 year

EFFICACY OVER TIME

The annual risk of contraceptive failure among methods that require user compliance should be lower the longer a woman uses the method, as users prone to fail do so early. As time passes, the group being studied should have relatively more successful contraceptive users (or those who are relatively infertile).

Still, over time the cumulative likelihood of contraceptive failure grows. For example, suppose that 18% of diaphragm users become pregnant in the first year, 12% in the second year, and 8% in the third year. By the end of the third year, 34% will have accidentally become pregnant (this result reflects the smaller size of the user pool in each year).

Table 11:1 Percentage of women experiencing an unintended pregnancy during the first year of perfect use and the first year of typical use and the percentage continuing use at the end of the first year, United States

Method	Percent of women experiencing an accidental pregnancy within the first year of use		Percent of women continuing use at one year ³
	Typical use ¹	Perfect Use ²	
Chance ⁴	85	85	
Spermicides ⁵	26	6	40
Periodic abstinence	25		63
Calendar		9	
Ovulation method		3	
Sympto-thermal ⁶		2	
Post-ovulation		1	
Cap ⁷			
Parous women	40	26	42
Nulliparous women	20	9	56
Sponge			
Parous women	40	20	42
Nulliparous women	20	9	56
Diaphragm ⁷	20	6	56
Withdrawal	19	4	
Condom ⁸			
Female (Reality)	21	5	56
Male	14	3	61
Pill	5		71
Progestin only		0.5	
Combined		0.1	
IUD			
Progesterone T	2.0	1.5	81
Copper T 380A	0.8	0.6	78
LNg 20	0.1	0.1	81
Depo-Provera	0.3	0.3	70
Norplant and Norplant-2	0.05	0.05	88
Female sterilization	0.5	0.5	100
Male sterilization	0.15	0.10	100

Emergency Contraceptive Pills: Treatment initiated within 72 hours after unprotected intercourse reduces the risk of pregnancy by at least 75%.⁹

Lactational Amenorrhea Method: LAM is a highly effective, *temporary* method of contraception.¹⁰

Table 11:1 Percentage of women experiencing an unintended pregnancy failure during the first year of perfect use and the first year of typical use and the percentage continuing use at the end of the first year, United States — Continued

Source: Hatcher RA et al. (1998)

¹Among *typical* couples who initiate use of a method (not necessarily for the first time), the percentage who experience an accidental pregnancy during the first year if they do not stop use for any other reason.

²Among couples who initiate use of a method (not necessarily for the first time) and who use it *perfectly* (both consistently and correctly), the percentage who experience an accidental pregnancy during the first year if they do not stop use for any other reason.

³Among couples attempting to avoid pregnancy, the percentage who continue to use a method for one year.

⁴The percentages becoming pregnant in columns (2) and (3) are based on data from populations where contraception is not used and from women who cease using contraception in order to become pregnant. Among such populations, about 89% become pregnant within one year. This estimate was lowered slightly (to 85%) to represent the percent who would become pregnant within one year among women now relying on reversible methods of contraception if they abandoned contraception altogether.

⁵Foams, creams, gels, vaginal suppositories, and vaginal film.

⁶Cervical mucus (ovulation) method supplemented by calendar in the pre-ovulatory and basal body temperature in the post-ovulatory phases.

⁷With spermicidal cream or jelly.

⁸Without spermicides.

⁹The treatment schedule is one dose within 72 hours after unprotected intercourse, and a second dose 12 hours after the first dose. Prevon (one dose is 2 blue pills) is the only dedicated product specifically marketed for emergency contraception in the United States. In addition, the U.S. Food and Drug Administration has declared the following brands of oral contraception safe and effective for emergency contraception: Ovral (1 dose is 2 white pills), Alesse or Levlite (1 dose is 5 pink pills), Nordette or Levlen (1 dose is 4 light-orange pills), Lo/Ovral or Levora (1 dose is 4 white pills), Triphasil or Tri-Levlen (1 dose is 4 yellow pills), Trivora (one dose is 4 pink pills).

¹⁰However, to maintain effective protection against pregnancy, another method of contraception must be used as soon as menstruation resumes, the frequency or duration of breastfeeds is reduced, bottle feeds are introduced, or the baby reaches six months of age.

FACTORS INFLUENCING EFFICACY

Some methods, such as sterilization, implants, and injectables, are naturally very effective, and proper and consistent use is nearly guaranteed. Other methods, such as the pill and intrauterine device (IUD), are also naturally very effective, but there is still room for the user to err, by forgetting to take her pills or failing to check for proper placement of IUD strings. Fertility awareness and barrier methods have lower natural effectiveness, and users have greater room to use the method improperly.

User Characteristics

Characteristics of the user can affect the probability that a contraceptive user may become pregnant:

1. **Pattern of use.** Imperfect users can expect to have higher pregnancy rates than perfect (consistent and correct) users. Unfortunately, most studies have not been able to measure perfect use adequately.
2. **Frequency of intercourse.** Among the characteristics of perfect users, the most important user characteristic that determines contraceptive failure is frequency of intercourse.^{13,24}
3. **Age.** Because a woman's biological ability to conceive and bear a child declines with age, pregnancy rates should decline with age. The biological decline is likely to be greatest among those who are routinely exposed to sexually transmitted infections (STIs) such as chlamydia and gonorrhea. Among those not so exposed to STIs, the decline is likely to be moderate until a woman reaches her late 30s.¹⁴ In many studies, however, increasing age is associated with decreasing frequency of intercourse, a factor that should drive down pregnancy rates.²⁵
4. **Involuntary intercourse.** In some relationships, a woman may be pressured or forced into intercourse. In these situations, she may not be able to use methods that are employed at the time of intercourse, such as condoms, vaginal barriers, or spermicides.

User characteristics such as race and income seem to be less important determinants of contraceptive failure.

Influence of the Investigator

The competence and honesty of the investigator also affect the published results. The errors committed by investigators range from simple arithmetical mistakes to outright fraud.²²

Methodological Pitfalls

Family planning providers should know that published studies are plagued by several methodological problems.

Pearl index. One of the most common problems is the inappropriate use of a measure of failure called the Pearl index. This measure is often used to compare pregnancy rates obtained from studies of women using the method for different amounts of time. As the risk of contraceptive failure declines over time because less effective users are removed as they become pregnant, those still using after a long period are unlikely to fail. Thus, by running a study a long time, an investigator can drive the reported pregnancy rate lower and lower. A better measure of failure is the life table, which is easy to interpret and controls for the distorting effects of varying durations of use.

Determining pregnancy. Deciding which pregnancies to count can be a problem. Most studies count only the pregnancies women observe and report. If, on the other hand, a pregnancy test were administered every month, the number of pregnancies (and hence the pregnancy rate) would increase because early fetal losses not observed by the woman would be added to the pregnancy total. Such routine pregnancy testing in the more recent pill trials has resulted in higher pregnancy rates than would otherwise have been obtained and makes their results not comparable to other pill trials or trials for other methods.

Incentives. Many studies of the pill and IUD are conducted because companies wishing to market them must carry out clinical trials to demonstrate their efficacy. In contrast, there have been few studies of withdrawal, because there is no financial reward for investigating this method. Moreover, researchers may have little incentive to report unfavorable results. Surgeons whose patients have with high pregnancy rates following sterilization simply do not write articles calling attention to their poor surgical skills. Likewise, drug companies do not commonly publicize their failures.

GOALS FOR TEACHING EFFICACY

Keep these thoughts in mind when counseling about contraceptive effectiveness:

1. **The best method of contraception is one that actually will be used correctly and consistently.**
2. **Pregnancy rate estimates apply to groups, not an individual user.** For example, a 5% probability of pregnancy during the first year for the pill will not protect the careless user and may not even apply to very young women, who are less likely to be compliant. The 20% probability of pregnancy during the first year from a diaphragm study need not discourage a careful and disciplined woman who has infrequent intercourse. Help your clients understand that numbers are not what protect—correct and consistent use protects.
3. **Make sure your staff provides consistent information.** One study of information provided by family planning staff indicated that providers tended to give the lowest reported probabilities of pregnancy for pills and IUDs, intermediate probabilities of pregnancy during typical use for diaphragms and foam, and higher than typical probabilities of pregnancy for condoms.²¹ Thus, family planning providers may extensively bias their client education in favor of methods they provide most frequently. Despite their safety, condoms and withdrawal get an undeserved low efficacy score within many family planning clinics and offices. You can avoid unintentional bias by deciding carefully what pregnancy rates your clinic or staff members are going to use.
4. **Technology fails people just as people fail technology.** In the past, clients were often told that unplanned pregnancies were their own fault because they did not use their method correctly or carefully. Contraceptives are imperfect and can fail even the most diligent user.

5. **Using two methods at once dramatically lowers the risk of unplanned pregnancy**, provided they are used consistently. If one of the methods is a condom or vaginal barrier, protection from disease transmission is an added benefit. For example, the probabilities of pregnancy during the first year of perfect use of condoms and perfect use of spermicides are estimated to be 3% and 6%, respectively. During perfect use, it is reasonable to assume that the contraceptive mechanisms of condoms and spermicides operate independently. The annual probability of pregnancy during simultaneous perfect use of condoms and spermicides would be 0.1%, the same as that achieved by the combined pill (0.1%) and the Levonorgestrel (LNg 20) IUD (0.1%) during perfect use. Even if the annual probabilities of pregnancy during perfect use for the condom and spermicides were twice as high—6% and 12%, respectively—the annual probability of pregnancy during simultaneous perfect use would be only 0.4%, comparable to that of the minipill (0.5%) and the Copper T 380A IUD (0.6%)!¹¹
6. **Methods that protect a person for a long time** (sterilization, implants, IUDs, and long-acting injections) **tend to be associated with higher contraceptive efficacy**, primarily because there is little opportunity for user error.

SAFETY: "WILL IT HURT ME?"

"I smoke. Won't the pill give me a heart attack?"

"Could the IUD puncture my womb?"

"Will I be able to get pregnant after stopping my method?"

In general, contraception poses few serious health risks to users, and no method poses as great a health risk as does pregnancy. Unplanned and unwanted pregnancies unnecessarily place women at health risks. Still, some contraceptives pose potential risk to the user.

- The method itself may have inherent dangers: it might be associated with death, hospitalization, surgery, side effects, infections, loss of reproductive capacity, or pain.
- Unplanned pregnancy is associated with risk: a particular woman must assess both the likelihood of contraceptive failure and the dangers a pregnancy would pose to both herself and her child. (See Chapter 1 on Health Benefits of Family Planning.)
- Future fertility may be influenced by contraceptive choice. (See Chapter 7 on Infertility.)

MAJOR HEALTH RISKS

For the most serious outcome of all—death—the absolute level of risk from contraception is extraordinarily low for most women. The risk of serious illness is also uncommon; the risk is greatest in women with underlying medical conditions that may be influenced by hormonal contraception:

- **Cardiovascular disease.** The pill has been associated with an increased risk of myocardial infarction and stroke. About one death in 100,000 users under the age of 45 has been attributable to the pill.⁸ Risk from the pill increases with age because risk factors such as hypertension, thromboembolic disease, diabetes, and a sedentary lifestyle increase with age. Smoking is a definite risk factor.
- **Cancer.** The association between cancer of the breast and cervix and the use of the pill remains under scrutiny.
 - There may be specific subpopulations of users who have an increased risk of breast cancer.²⁰ Risk factors for breast cancer include a family history of breast cancer and delayed or no childbearing.
 - Cervical cancer has been reported more often in pill users, although the correlation may be due to other, unidentified factors that place the oral contraceptive user at a higher risk.² Risk factors for cancer include having had multiple sexual partners and cigarette smoking.

Conversely, the pill appears to protect users against cancers of the endometrium³ and ovary.⁴ Also, barrier methods used in conjunction with spermicides decrease the user's risk of cervical cancer.^{15,17}

FUTURE FERTILITY

An important issue in helping a couple evaluate the safety of a contraceptive may be their future childbearing aspirations. There are several important considerations to keep in mind to protect the future fertility of contraceptive clients:

- **Abstinence** is the single most effective and risk-free means of protecting future fertility.
- **Pregnancy** and the outcomes of pregnancy carry substantial risks to future fertility.
- **The pill**, which has a protective effect against acute gonococcal pelvic inflammatory disease (PID) and decreases the risk of ovarian cyst surgery and fibromyomata, may be the ideal contraceptive option for the woman who wants to be sexually active for a number of years before bearing children.⁸ Perhaps the best contraceptive option for a young healthy woman who wishes to delay her childbearing is the combination of pill and condom.
- **Mechanical and chemical barriers** combined offer the greatest protection against damage to the fallopian tubes.⁵
- **Some IUDs**, which can increase the risk of PID, are probably the least desirable option for women who want to preserve fertility.¹⁶ The Levonorgestrel IUD, however, may decrease the risk of PID.
- **Sterilization** must be considered permanent.

No matter what other methods of contraception a woman is using, if she is at any risk because her partner tests positive for the human immunodeficiency virus (HIV) or because she does not know his status, she should use plastic or latex condoms with every sexual act. No other contraceptive method besides abstinence provides the same degree of protection.

SIDE EFFECTS

Often, the minor side effects of contraceptives, in addition to the more serious complications, influence whether an individual selects a certain method. "What physical changes will I undergo?" "Will I be annoyed by spotting, weight gain, cramping, or the sensation of using a given method?" Clinicians cannot dismiss the important role that side effects play when an individual must repeatedly assess whether to continue using a method or whether to use it consistently.

Side effects can be hormonally or mechanically induced. Headaches, weight gain, and depression can be side effects of hormonal methods. Menstrual changes such as spotting and decreased or increased bleeding can be caused by hormonal or mechanical methods. Changes in physical sensations, such as decreased sensitivity of the penis or a feeling of pressure on the pelvic walls, and the problem of uterine cramping, are generally caused by mechanical methods.

For almost all of these side effects, instruction and client education can help users accept and understand what is happening. The appearance of side effects that are not serious is not a medical reason to avoid using a method.

PRECAUTIONS

Because some women are relatively more likely to encounter problems with a specific method of birth control, considering the precautions to the methods is important when a woman chooses her method. Most of the serious pill and IUD problems could be avoided by (1) not using the methods to which a woman has medical precautions and (2) teaching the user to recognize the early warning signals for serious complications.

The authors prefer to use the term "precautions" rather than contraindications. In the past, lists of contraindications have created barriers to contraceptive provision and use. Health educators, journalists, clinicians, and clients need only see the word "contraindication" linking a medical condition and a medication they are considering using,

and all attempts to qualify the degree of contraindication are virtually futile. In place of contraindicating the use of a method, a graded scale of conditions may serve as medical eligibility criteria for starting contraceptive methods. The Appendix, developed by the World Health Organization, lists the conditions and considerations for selection.

GOALS FOR TEACHING SAFETY

1. **Try to educate the client about misconceptions.** People who are afraid do not respond well to rational persuasions. Many clients hold certain opinions about contraceptives—that the pill is very dangerous even to healthy, nonsmoking young women or that injectables lead to permanent sterility (see Table 11:2). However, if you see you are getting nowhere, stop. Help each client select a method that can be used without fear.
2. **Make sure that you and your staff know all about the major side effects** of contraceptives, such as the relationship between pill use and blood clots or reproductive cancers. Give accurate information.
3. **Tell clients what they need to know** even if they do not ask. Clients do not always ask the questions they need answered.
4. **Compare the contraceptive risks** with the risks a woman faces if she becomes pregnant. In general, the risks of pregnancy, abortion, and delivery are far greater than those for using a contraceptive.
5. **Help clients make a contraceptive choice that will protect them from both pregnancy and sexually transmitted infections (STIs).** Safety concerns often overlap with worries about infections.
6. **Teach clients the danger signals** of the method they select. If a danger signal appears, the informed user can quickly seek help.

NONCONTRACEPTIVE BENEFITS

Although the noncontraceptive benefits provided by certain methods are not generally the major determinant for selecting a contraceptive method, they certainly can help clients decide between two or more suitable methods (see Table 11:3).

As the acquired immunodeficiency syndrome (AIDS) epidemic continues, methods that reduce the user's risk of acquiring human immunodeficiency virus (HIV) infection provide a noncontraceptive benefit that may weigh as heavily as the contraceptive benefit. Any sexually active person who may be at risk of acquiring infection with HIV, human papilloma virus (HPV), gonorrhea, syphilis, chlamydia, herpes, or other STI should consider male (or female) condoms.

Oral contraceptives offer several noncontraceptive benefits: they protect against symptomatic PID, cancers of the ovary and endometrium, recurrent ovarian cysts, and benign breast cysts and fibroadenomas.⁸ In addition, as women who have suffered menstrual cramps and discomforts can attest, the pill eases their discomforts. Make it a practice to tell your clients about the noncontraceptive benefits of the various methods. Having additional reasons for using the contraceptive will probably improve their motivation to use the method correctly and consistently.

Table 11:2 Percentage of women who do not use contraceptives reporting health concerns about pills, IUDs, and sterilization

Country	Pill					IUD					Sterilization					
	No problem	Health concerns	Other concerns	Don't know	No problem	Health concerns	Other concerns	Don't know	No problem	Health concerns	Other concerns	Don't know	No problem	Health concerns	Other concerns	Don't know
Burundi	21.1	15.9	1.6	61.5	18.0	22.5	0.0	59.5	43.6	3.9	0.0	52.5	43.6	3.9	0.0	52.5
Ghana	24.3	28.6	5.0	42.1	10.6	23.4	6.4	59.6	19.2	21.9	1.4	57.5	19.2	21.9	1.4	57.5
Kenya	18.6	43.2	6.2	32.0	12.4	31.6	21.0	35.0	29.1	25.2	6.6	39.1	29.1	25.2	6.6	39.1
Mali	31.5	14.5	17.5	36.5	24.6	14.9	19.7	40.9	33.4	8.1	34.5	24.0	33.4	8.1	34.5	24.0
Sudan	12.9	45.1	4.2	37.9	14.8	36.2	14.1	34.9	43.8	11.6	26.8	17.9	43.8	11.6	26.8	17.9
Uganda	7.6	42.5	3.7	46.2	7.9	36.5	7.4	48.2	12.2	23.6	21.0	43.2	12.2	23.6	21.0	43.2

Source: Bongaarts and Bruce (1995)

Personal Considerations

A method that does not fit the individual's personal lifestyle or societal norms will not likely be used correctly or consistently, and possibly will not be used at all. Take into account the woman's and partner's attitudes as well as their situation (see Table 11:4). Some issues are relatively easy to manage, such as providing health education to couples who lack knowledge of contraceptive methods. Other issues, however, such as a husband's disapproval of contraception, require great care.

Comfort and Confidence

The best method of birth control for clients is one that will be in harmony with their wishes, fears, preferences, and lifestyle. Table 11:5 lists questions designed to help clients determine whether a certain birth control method is a realistic choice. These questions may be used exactly as written or adapted for local use without permission. "Don't know" answers point to a need for more thinking, more introspection, or more information. "Yes" answers may mean the user might not like or be successful with the method. Most individuals will have a few "yes" answers. "Yes" answers mean that potential problems may lie in store. If clients have more than a few "yes" responses, they may want to talk to their clinician, counselor, partner, or friend. Talking about their concerns can help them decide whether to use this method, or if they use it, how to do so in a way that will truly be effective for them. In general, the more "yes" answers they have, the less likely they are to use this method consistently and correctly.

Table 11:3 Noncontraceptive benefits, risks, and side effects

Method	Dangers	Side Effects	Noncontraceptive Benefits
Pill	Cardiovascular complications (stroke, heart attack, blood clots, high blood pressure), depression, hepatic adenomas, possible increased risk of breast and cervical cancers	Nausea, headaches, dizziness, spotting, weight gain, breast tenderness, chloasma	Decreases menstrual pain, PMS, and blood loss; protects against symptomatic PID, some cancers (ovarian, endometrial) and some benign tumors (leiomyomata, benign breast masses), and ovarian cysts; reduces acne
IUD	PID following insertion, uterine perforation, anemia	Menstrual cramping, spotting, increased bleeding	None known except for progestin-releasing IUDs, which decrease menstrual blood loss and pain
Male Condom	Anaphylactic reaction to latex	Decreased sensation, allergy to latex, loss of spontaneity	Protects against sexually transmitted infections, including HIV; delays premature ejaculation
Female Condom	None known	Aesthetically unappealing and awkward to use for some	Protects against sexually transmitted infections
Implant	Infection at implant site, complicated removals, depression	Tenderness at site, menstrual changes, hair loss, weight gain	Lactation not disturbed; may decrease menstrual cramps, pain, and blood loss
Injectable	Depression, allergic reactions, pathologic weight gain, possible bone loss	Menstrual changes, weight gain, headaches, adverse effects on lipids	Lactation not disturbed, reduces risk of seizures, may have protective effects against PID and ovarian and endometrial cancers
Sterilization	Infection; anesthetic complications; if pregnancy occurs after tubal sterilization, high risk that it will be ectopic	Pain at surgical site, psychological reactions, subsequent regret that the procedure was performed	Tubal sterilization reduces risk of ovarian cancer and may protect against PID
Abstinence	None known	Psychological reactions	Prevents infections, including HIV

Table 11:3 Noncontraceptive benefits, risks, and side effects
(Continued)

Method	Dangers	Side Effects	Noncontraceptive Benefits
Barriers: Diaphragm, Cap, Sponge	Vaginal and urinary tract infections, toxic shock syndrome	Pelvic pressure, vaginal irritation, vaginal discharge if left in too long, allergy	Provides modest protection against some sexually transmitted infections
Spermicides	Vaginal and urinary tract infections	Vaginal irritation, allergy	Provides modest protection against some sexually transmitted infections
Lactational Amenorrhea Method (LAM)	Increased risk of HIV transmission to infant if mother HIV+	Mastitis from staphylococcal infection	Provides excellent nutrition for infants under 6 months old

Source: Hatcher et al. (1998)

Reproductive Life Span

A typical African woman spends about 35 years—more than half her life span of 67 years—at potential biological risk of pregnancy, during the time from menarche (at about age 13) to natural menopause (at about age 48). What matters most to a woman when she considers a contraceptive will ordinarily change over the course of her reproductive life span. As is shown in Table 11:6, different reproductive stages are associated with distinct fertility goals and sexual behaviors.

- From menarche to first planned birth, the primary fertility goal is to postpone pregnancy and birth.
- Between the first and last planned births, the primary goal is to space pregnancies leading to births.
- Between the last planned birth and menopause, the goal is to cease childbearing altogether.

In the stage between her last birth and menopause, the most important factor for a woman is a method's efficacy at preventing pregnancy; women typically opt for female or male sterilization.

Table 11:4 Percentage of women who do not use contraceptives reporting reasons for nonuse

Country	Lack of knowledge	Health concerns	Husband disapproves	Infrequent sex	Religion	Difficult access	Opposed to family planning				Fatalism	Inconvenient to use	Others
							Cost too high	Cost too high	Cost too high	Cost too high			
Burundi	34.8	7.7	5.7	7.4	3.5	3.3	1.0	4.5	3.0	4.1	1.0	24.0	
Ghana	33.5	16.0	6.8	8.3	6.3	5.3	3.9	2.9	n.a.	3.4	0.5	13.1	
Kenya	27.6	16.8	19.8	7.3	2.7	1.2	4.1	0.2	1.9	2.2	0.4	16.0	
Mali	41.3	4.6	12.1	0.5	12.3	3.4	n.a.	n.a.	n.a.	n.a.	3.2	22.6	
Sudan	32.8	26.3	10.7	1.2	7.5	4.2	3.0	1.2	9.6	2.7	0.3	0.6	
Uganda	48.2	8.0	8.4	3.9	1.7	10.1	3.9	4.9	2.8	2.8	0.9	4.4	

Source: Bongaarts and Bruce (1995)

Table 11:5 Contraceptive comfort and confidence scale

Method of birth control you are considering using: _____

Length of time you used this method in the past: _____

Answer YES or NO to the following questions:

	YES	NO
1. Have I had problems using this method before?		
2. Have I ever become pregnant while using this method?		
3. Am I afraid of using this method?		
4. Would I really rather not use this method?		
5. Will I have trouble remembering to use this method?		
6. Will I have trouble using this method correctly?		
7. Do I still have unanswered questions about this method?		
8. Does this method make menstrual periods longer or more painful?		
9. Does this method cost more than I can afford?		
10. Could this method cause me to have serious complications?		
11. Am I opposed to this method because of any religious or moral beliefs?		
12. Is my partner opposed to this method?		
13. Am I using this method without my partner's knowledge?		
14. Will using this method embarrass my partner?		
15. Will using this method embarrass me?		
16. Will I enjoy intercourse less because of this method?		
17. If this method interrupts lovemaking, will I avoid using it?		
18. Has a nurse or doctor ever told me NOT to use this method?		
19. Is there anything about my personality that could lead me to use this method incorrectly?		
20. Am I at any risk of being exposed to HIV (the AIDS virus) or other sexually transmitted infections if I use this method?		

Total number of YES answers: _____

Most individuals will have a few "yes" answers. "Yes" answers mean that potential problems may arise. If you have more than a few "yes" responses, you may want to talk with your physician, counselor, partner, or friend to help you decide whether to use this method or how to use it so that it will really be effective for you. In general, the more "yes" answers you have, the less likely you are to use this method consistently and correctly at every act of intercourse.

Table 11:6 The stages of reproductive life

	Adolescents and young adults		Later reproductive years	
	Menarche to first intercourse	First intercourse to first birth	First birth to last birth	Last birth to menopause
Fertility goals				
Births	postpone	postpone	space	prevent
Ability to have children	preserve	preserve	preserve	irrelevant
Sexual behavior				
# of partners	none	multiple?	one?	one?
Coital frequency	zero	moderate to high	moderate	moderate to low
Coital predictability	low	moderate to high	high	high
Importance of method characteristics				
Pregnancy prevention		high	moderate	high
Prevention of pelvic inflammatory disease (PID)		high	moderate	low
Not coitus-linked		high	low	moderate
Reversibility		high	high	low
Most common methods				
Most common		pill	pill	sterilization
Next most common		condom	condom	pill, condom

Source: Forrest (1993)

Cost of Contraceptives

We cannot provide contraceptives without considering the client's financial circumstances.¹² A woman should be told in advance what her ongoing expenses will be. If cost will impose a major hardship, offer an alternative contraceptive or a means of obtaining the desired contraceptive less expensively. The economic implications of using some forms of contraception have become significant. However, the cost of contraception is substantially less than the cost of delivering and raising a child.²³

Pattern of Sexual Activity. In considering their contraceptive choice, both women and men should be influenced by their number of partners and their frequency of intercourse.

The number of partners affects the risk of STIs. In some cases, it will be obvious that an individual has more than one partner at any given time. Less obvious are the individuals who practice serial monogamy. These persons have only one partner at a time; however, the relationships are not permanent, and after they end, the individual will move on to a new partner. The methods that would most protect individuals from STIs require the commitment, understanding, and assertiveness of the client. The practitioner recommending the use of condoms (male or female) or other barrier protection must be prepared to take the time required to discuss risks, encourage behavioral change, and teach skills.

The frequency of intercourse also has bearing on a person's contraceptive choice. For example, the woman who has infrequent intercourse may not wish to use a method that requires daily medication or continuous exposure to possible side effects posed by pills, implants, injections, or IUDs. On the other hand, infrequent intercourse may also indicate that a client is at risk of unpredicted intercourse. These clients may need skills in "expecting the unexpected."

Husband's Objections

In sub-Saharan Africa, many women who do not want more children still do not use contraception because they say they face opposition from their husbands.¹ (See Table 11:4.) Surprisingly, lack of discussion may be the reason they believe they face opposition. More than half of women who report their husbands disapprove of family planning have never even discussed family planning with them. These clients need skills in initiating nonthreatening discussions with their husbands and then selecting methods that would suit the couple's relationship.

Access to Medical Care. Many women have difficulty gaining access to the health care system: they do not understand the system, cannot afford it, or find that it shuns them. Others may find their

access hampered by too long a wait at the clinic. Studies have shown that access has great bearing on contraceptive compliance and choice.²⁶ Access can be eased for all clients by providing a full year's supply of contraceptives (13 cycles of pills or 100 condoms).

Goals for Teaching About Personal Considerations

Key concepts for discussing and teaching about contraceptive choice and personal considerations include the following:

1. **The client decides which personal considerations matter.** Only the potential user can weigh all the elements for personal choice, and the clinician will not be able to predict what matters. Privacy? Lubrication? Light periods? What big sister uses? Do not guess—ask.
2. **It is a long way from the examination room to the bedroom.** We offer methods as medicines in a clinical setting, and then our clients go home and use them in a sexual setting, be it a bedroom or a field. Remember to help your client think through the sexual aspects of contraception.
3. **Clients may need permission to make a second (or third) contraceptive choice.** They may not like the first method at all and will need to know it is a good idea to come back to try something else. Besides, it is always good to know how to use several methods.
4. **Clients can be encouraged to talk about birth control issues with their partners.** How can one person decide whether a method of birth control will be compatible with a couple's personal and sexual styles? Help your clients practice discussing birth control with their partners if this is new territory for them.
5. **Personal considerations are likely to change over time.** Teenagers and 35-year-olds will use very different criteria as they evaluate their contraceptive choices. Encourage clients to rethink their contraceptive needs as their lives, sexual drives, and bodies change over time.
6. **Teach clients a wise and cautious approach to sexual activity.** All sexually active people need to know the risk factors for STIs and HIV infection and how to avoid them.

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Lactation and Postpartum Contraception

A number of women in the community had stopped breastfeeding their babies early, so Dr. N puzzled over how to balance what he told the new mother about breastfeeding and about contraception. Breastfeeding was important for the baby and a contraceptive should not interfere with that. The mother should try to space her next pregnancy by about 2 years, so perhaps a contraceptive was quite necessary. He knew that women in this community generally breastfed their babies on demand for the first several months. This very practice would help protect the woman from becoming pregnant for about 6 months. Dr. N carefully explained breastfeeding practices to his patients, and he made certain they had contraceptive supplies at home well before the baby's 6-month birthday.

Breastfeeding contributes significantly to both birth spacing and child survival. Breast milk is an ideal source of nutrition for infants and provides an important level of immunological protection against infection. In addition, the lactational amenorrhea method (LAM) is a highly effective method of contraception. Other methods of contraception, such as barrier methods, progestin-only methods, and the intrauterine device (IUD) are also excellent options for women postpartum. Staff at family planning clinics have an important role in promoting breastfeeding.

LACTATION

Breastfeeding practices vary considerably in Africa. Breastfeeding is quite prevalent in both North Africa and sub-Saharan Africa, where about a third of children aged 4 to 6 months are fully breastfed (not receiving supplemental solid foods or milk). In countries such as Burundi and Mali, more than half the children aged 4 to 6 months are fully breastfed.⁷⁵

Populations with low contraceptive use in which infants are intensively and extensively breastfed have lower fertility rates than populations with infrequent, short durations of breastfeeding.^{2,4,38} Several cultures practice sexual abstinence after childbirth, often while the mother is breastfeeding. This practice decreases postpartum fertility and contributes to child spacing. The length of postpartum abstinence varies from country to country, with average periods of abstinence close to a year or longer reported in Burkina Faso, Cameroon, and Cote d'Ivoire (see Table 12:1).

To provide appropriate advice to postpartum clients, staff should understand related cultural practices. Traditional beliefs include taboos on breastfeeding during pregnancy and sexual relations during lactation.⁸⁶ However, as countries modernize, the length of both breastfeeding and postpartum abstinence may decline.³⁴ Women in rural areas tend both to fully breastfeed longer and to practice abstinence longer,²⁷ while women who live in urban areas and those of higher socioeconomic status more commonly bottle feed.³ Recently, the duration of breastfeeding has increased among women in both urban and rural areas of countries such as Kenya and Ghana.⁸⁴ Women who are younger, have more years of education, use modern contraceptives,⁵² and have wage employment tend to breastfeed for shorter durations.^{64,78} Polygynous marriages may play a role in both extended periods of abstinence and breastfeeding.^{63,75}

POSTPARTUM AND LACTATIONAL PHYSIOLOGY

Women may be infertile for a brief period after giving birth, but the postpartum woman may regain her fertility before she detects signs

that her menstrual cycle is about to resume. The breastfeeding woman will have a longer period of infertility than will the non-breastfeeding woman, but neither can predict when fertility will return.

Most nonlactating women resume menses within 4 to 6 weeks of delivery, but approximately one-third of first cycles are anovulatory, and a high proportion of first ovulatory cycles have defective luteal phases.²² Fifteen percent of the second and third menstrual cycles are anovulatory, and a quarter of those that are ovulatory have luteal-phase defects. Among nonlactating women, the first ovulation occurs on average 45 days postpartum.

Table 12:1 Median duration of any breastfeeding, full breastfeeding, postpartum amenorrhea, postpartum abstinence and postpartum insusceptibility

Country/Date	Breast-feeding	Full Breast-feeding	Amenor-rhea	Abstinence	Insusceptibility
Burkina Faso 1993	25.2	0.6	14.6	18.9	22.2
Cameroon 1991	17.4	1.9	10.4	13.3	16.0
Central African Republic 1994-95	20.6	2.1	14.1	10.4	16.4
Cote d'Ivoire 1994	20.3	3.7	12.3	11.8	16.6
Ghana 1993	21.4	2.0	13.0	9.0	16.2
Kenya 1993	21.1	0.7	10.8	3.0	12.9
Madagascar 1992	19.4	1.6	12.5	3.6	13.4
Malawi 1992	21.2	1.2	11.9		
Mali 1995-96	21.6	6.8	13.6	2.8	14.4
Namibia 1992	17.3	1.7	8.3	6.0	12.8
Niger 1992	20.9	0.6	15.2	2.0	15.8
Nigeria 1990	19.5	1.5	14.6	10.8	19.0
Rwanda 1992	27.9	5.5	16.6	0.6	17.1
Senegal 1997	20.9	4.5	13.2	2.9	15.1
Sudan 1989-90	19.5		13.9	5.0	15.2
Tanzania 1996	21.5	2.2	12.1	5.6	15.7
Uganda 1995	19.5	3.5	12.6	2.2	13.4
Zambia 1996	20.0	2.5	11.5	4.7	14.1
Zimbabwe 1994	18.5	0.7	12.9	3.5	14.1

Source: Data from the Demographic and Health Surveys

Breastfeeding extends postpartum infertility by delaying ovulation and by reducing the likelihood of conception once ovulation or menses return. After the sixth month postpartum, it is increasingly likely that a woman will resume ovulation before menstruation returns.^{7,42,51} However, even after menses return, the hormonal effects of lactation lead to fewer ovulatory cycles and luteal phase defects, further decreasing fertility.^{2,17,24,38,39}

Infant suckling causes both the production of breast milk and the prevention of ovulation through complex hormonal reflexes. Suckling stimulates sensory cells in the nipple and areola, which signal the hypothalamus to release various hormones. One of these hormones, prolactin, stimulates milk production. Suckling directly reduces the release of gonadotropin-releasing hormone (GnRH) by the hypothalamus,⁵⁶ which in turn suppresses the release of luteinizing hormone (LH) required for follicle stimulation in the ovary. Suckling also triggers the release of the hormone oxytocin from the posterior hypothalamus. Oxytocin causes the muscle cells in the areola to contract and squeeze out milk, known as milk "let down." Auditory stimuli (e.g., a crying baby) and other stimuli can lead to "let down." Maternal conditions such as pain, fatigue, sore breasts, stress, and anxiety may inhibit this process.

Full or nearly full breastfeeding is associated with longer periods of lactational amenorrhea and infertility. Frequent, continuous stimulation of the breast by around-the-clock suckling strengthens the reflex that produces the contraceptive effect.^{21,42} Together, a high frequency of breastfeeding episodes per day and a longer duration of suckling per breastfeeding episode significantly delay the return of ovulation.^{7,21,31} Supplementary use of bottle feeding appears to reduce breastfeeding frequency far more than supplementary use of cup and spoon feedings.⁷ However, even partial breastfeeding can inhibit ovulation and prolong amenorrhea. In summary:

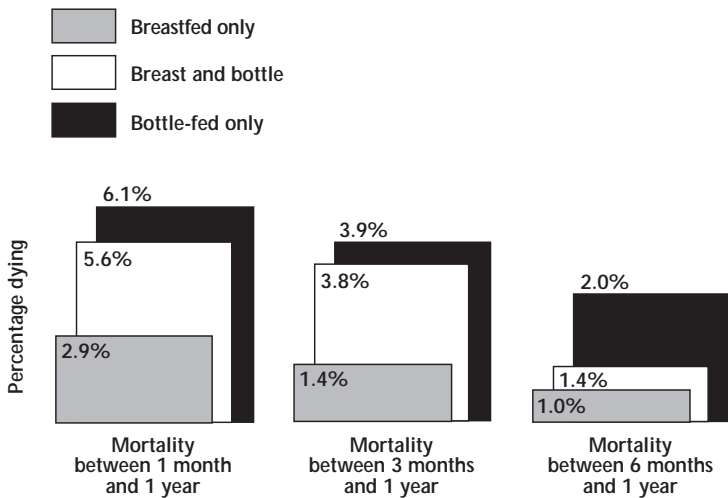
- Breastfeeding delays the onset of ovulation and the return of menses after childbirth.
- The longer a woman breastfeeds, the more likely she will begin menstruating while she is still breastfeeding.

- Breastfeeding decreases fertility even after menstrual bleeding resumes.
- A woman may ovulate before her first menses, especially with prolonged or supplemented breastfeeding.
- Low frequency and short duration of breastfeeding, sometimes due to supplemental feeding, can decrease lactational infertility.

HEALTH BENEFITS OF BREASTFEEDING

At any age, breastfeeding increases an infant's survival chances.^{58,59,65,66,74,87} (See Figure 12:1.) Infants who are breastfed during the first 2 months of life have only 37% of the risk of death during that period that non-breastfed infants face.⁶⁶ Breastfeeding improves child survival the most in countries with high levels of infant mortality and among poorer subgroups within each population.⁶⁵

Figure 12:1 Infant mortality during first year of life by source of milk



Source: Adapted from Galway et al. (1987)

Breastfeeding improves infants' chances of survival for two reasons: (1) breast milk has unique nutritive and anti-infective properties, and (2) breastfeeding contributes to birth spacing, which in turn promotes survival. Breast milk contains all the nutrients an infant needs for the first 4 to 6 months of life. The mixtures of protein, fat, carbohydrate, and trace elements in breast milk change over time to meet the infant's evolving needs.⁵² The particular combination of minerals, vitamins, and amino acids found in human milk is distinct from that in cow's milk, which has a much higher proportion of protein and is more difficult to digest.³⁵ Many infant formulas combine protein, carbohydrates, and electrolytes in good balance, but they are still inferior to breast milk. However, when the woman cannot breastfeed or the infant fails to grow, formulas meeting the Codex requirements are the best option.

Several anti-infective agents are found in human milk. Immunoglobulins, leukocytes, and the bifidus factor all help guard the newborn against several types of bacteria and other harmful organisms.^{35,52,71} These anti-infective agents are always present in breast milk and are concentrated in the colostrum, the breast milk available during the first few days of an infant's life. On the other hand, these agents are absent from infant formula. As a result, breastfed infants have lower risks of respiratory and gastro-intestinal illness,^{18,30,46,52} and preterm infants who are breastfed have lower rates of neonatal necrotizing enterocolitis.⁵²

Breastfed infants are less likely to develop allergies, including eczema, cow's milk allergy, and allergic rhinitis.⁵² Asthma may be less common and less severe among children who are breastfed.⁴⁶ Decreases in the incidence of otitis media^{46,52} and dental caries⁴⁸ are also associated with breastfeeding.

Frequent breastfeeding also improves infant health by lengthening the time between births. Children born within 2 years of their immediately older sibling have a 52% to 161% higher probability of dying within the first 5 years of life than children born more than 2 years after their immediately older sibling.²⁹ (See Chapter 1 on Benefits of Family Planning.) This greater risk may be due to maternal depletion and sibling competition as well as pregnancy-induced wean-

ing of the child.⁶⁵ Thus, the lengthening of the birth interval that breastfeeding can provide can indirectly raise survival chances for a child.⁸⁷

Lower cost is another advantage of breastfeeding over infant formula. Because formula is expensive, some mothers try to save money by diluting the mixtures, which reduces their nutritional value. Some families make their own formula by mixing flour and sugar with water to give the appearance of milk.¹⁴ Formula is often contaminated from using impure water supplies, which can result in diarrhea, a major killer of infants in developing countries. Exclusive breastfeeding (no supplementation) is highly protective against diarrhea.^{33,70}

Breastfeeding has several benefits for the mother as well. Breastfeeding causes the release of oxytocin, which stimulates uterine contractions, and these in turn, help decrease postpartum hemorrhage. Breastfeeding mothers experience a rapid return of uterine tone. In addition, women who breastfeed have a lower risk of ovarian cancer^{76,81} Women who have ever breastfed have a lower risk of breast cancer, and the degree of protection increases with duration of lactation.¹⁶ Although reports are conflicting, breastfeeding may also protect against osteoporosis in later life.¹⁶ Finally, extended breastfeeding facilitates the emotional bond between mother and infant, which may lead to better care of the infant and to increased psychological well-being.⁴⁶

HUMAN IMMUNODEFICIENCY VIRUS AND BREASTFEEDING

Human immunodeficiency virus 1 (HIV-1) can be transmitted by an infected mother to her infant in utero, during childbirth, and through breast milk. That HIV-1 can be transmitted by breastfeeding has been conclusively demonstrated by prospective studies of mothers who were infected postnatally.^{13,85} Rates of maternal-fetal transmission through all three routes combined average 23% to 42%.⁶⁹ Most infants who are infected with HIV-1 acquire the infection in utero or during childbirth. When the mother is infected prenatally, breastfeeding adds an estimated 14% to the risk of HIV-1 transmission.¹³ When the mother was infected postnatally, the risk of HIV-1 transmission is 29%.¹⁴ The risk of perinatal

transmission of HIV-2 is much lower than the risk of perinatal transmission of HIV-1.¹ (See Chapter 5 on HIV, AIDS, and Reproductive Health.)

All babies born to an HIV-infected mother carry passively acquired maternal antibodies to HIV. Those infants who are not infected will gradually lose these antibodies, which nevertheless may persist in some cases until the infants are 15 months of age. Because standard tests for HIV detect HIV antibodies and not the virus itself, they cannot reliably determine which infants born to HIV-positive mothers have been infected until the child has lost the maternal antibodies.²⁵ Thus, the HIV status of infants born to HIV-infected mothers cannot be ascertained until well after birth. It is possible that new, inexpensive HIV tests will be developed that will yield positive results only if the infant is HIV-positive when cord blood is tested. In such cases, a negative result would not conclusively indicate that the infant was HIV-negative.⁵⁷ If such a test is developed, HIV-positive mothers might be advised that an infant who tests positive could be breastfed.

Clearly, the twin facts that breastfeeding greatly reduces infant morbidity and mortality on the one hand but that HIV can be transmitted by breastfeeding on the other pose a dilemma. In particular, there has been much discussion on whether breastfeeding should be discouraged in areas where HIV is prevalent.^{9,13,20,28,32,40,61,77} The World Health Organization concluded in 1998 that:

When children born to women living with HIV can be ensured uninterrupted access to nutritionally adequate breast-milk substitutes that are safely prepared and fed to them, they are at less risk of illness and death if they are not breast-fed. However, when these conditions are not fulfilled, in particular in an environment where infectious diseases and malnutrition are the primary causes of death during infancy, artificial feeding substantially increases children's risk of illness and death.⁹¹

NUTRITION FOR BREASTFEEDING WOMEN AND THEIR INFANTS

Breast milk provides the new infant with adequate calories and protein for the first 6 months of life and offers immunologic protec-

tion derived from maternal antibodies and other factors. The breastfed infant is, therefore, less likely to suffer from diarrheal and other infectious diseases.⁸⁷ For maximum protection, breastfeeding should be continued for at least 2 years and practiced exclusively for at least 6 months "on demand," day and night, whenever the baby is hungry.

Sustained breastfeeding may not be possible for the mother who works away from the home. In such cases, she should try to nurse the infant several times both day and night and make certain her baby is getting good protein supplements or expressed breast milk. The excellent protein balance in breast milk complements other foods given to the infant. If a woman must give her infant bottled formulas, she should prepare and mix them in the correct concentration so that the baby receives enough protein and calories for healthy growth.

What happens if an infant does not get adequate nutrition? Two extreme syndromes that may result are marasmus and kwashiorkor. Infantile marasmus is often caused by premature weaning from breast milk, often because the mother is pregnant again and believes she cannot continue to breastfeed. Substituting grossly inadequate feeding from other sources deprives the infant of necessary calories and proteins. Kwashiorkor affects a child who is weaned to a diet sufficient in calories but deficient in proteins and nitrogen. For every case of marasmus or kwashiorkor, however, many other children suffer more moderate forms of malnutrition.

Women need more calories when they are breastfeeding. They derive a substantial part of these calories from stores built up during pregnancy. Any increase in calories or decrease in energy expenditures will help the breastfeeding mother retain her health, although a balanced diet including protein sources is best. Nursing mothers also need calcium, iron, and vitamins, which should be supplied through diet or supplements.⁹² Family planning can aid a mother's nutrition by preventing a rapid succession of pregnancies that can drain her reserves of nutrition built up during pregnancy. If the mother diets or does not gain sufficient weight during pregnancy, she will need even more calories and proteins during breastfeeding.

COMPLICATIONS OF BREASTFEEDING

Breastfeeding is associated with few serious complications. Lactating women may have breast tenderness, breast infections, and other problems that can be managed with straightforward clinical remedies. More important, instructing the mother both before and after delivery on how she can address potential problems can make breastfeeding easier (see Table 12:2). If a woman is undernourished and breastfeeding, she may be at risk of energy depletion.⁴⁷ Thus, any intervention in the postpartum period should include feeding the mother during the period in which she is breastfeeding the infant.

When women lactate, their estrogen levels are very low and they may have less vaginal lubrication than usual. They may need to use a simple lubricant during sexual intercourse to reduce discomfort. With sustained breastfeeding and the suppression of estrogens, some women will experience other symptoms similar to those of menopause: hair loss, dermatologic changes, and hot flashes.⁴⁸ These side effects diminish when menstrual cycles resume or when breastfeeding declines. It is important not to use estrogen treatment for these symptoms, because estrogen decreases milk production.

THE LACTATIONAL AMENORRHEA METHOD OF CONTRACEPTION

Breastfeeding provides more than 98% protection from pregnancy in the first 6 months if the infant's diet is not supplemented (or supplemented only to a minor extent) and if the woman has not experienced her first postpartum menses.⁴² One clinical study of LAM found a cumulative 6-month pregnancy rate of 0.5% among women who relied solely on LAM and used the method perfectly.⁶⁸ Thus, LAM is an excellent method of contraception and has a pregnancy rate less than most other reversible methods. (see Figure 12:2).

Breastfeeding in general is an effective contraceptive at the population level and can also be an effective contraceptive for an individual

woman, depending on the frequency and duration of suckling and whether she is menstruating. Because frequent and exclusive breastfeeding suppresses ovulation, LAM is an effective temporary, introductory contraceptive for up to 6 months postpartum, as long as a woman follows the general guidelines to recognize her return to fertility.

LAM may also be appropriate beyond 6 months or if the infant is supplemented, as long as she breastfeeds intensely. The 6-month limit for LAM exists primarily because infant diets need to be supplemented after that time to ensure continued growth and development⁵² and to avoid iron-deficiency anemia.⁶ Cumulative pregnancy rates during lactational amenorrhea (regardless of whether the infant received supplementary food) at 6 and 12 months are 2.9% and 5.9%, respectively, compared with 0.5% at 6 months for LAM.⁴³

Table 12:2 Complications of breastfeeding and their management

Problem	Description	Solution
Sore breasts	Mother has pain in breasts (not nipples) while breastfeeding.	Reassure mother this is not unusual. Correct positioning of infant may help. The pain may be related to a poorly functioning let-down response and will usually disappear within a few weeks.
Engorgement	Breasts enlarged with generalized tenseness and tenderness.	Mother should breastfeed frequently and for 10 to 15 minutes on each side at each feeding. 1) In first few days there is little milk. This discomfort will diminish with time. Mother may use mild analgesic. 2) If separated from infant for long period, mother should massage breasts and manually empty every 4 hours until she returns to infant.

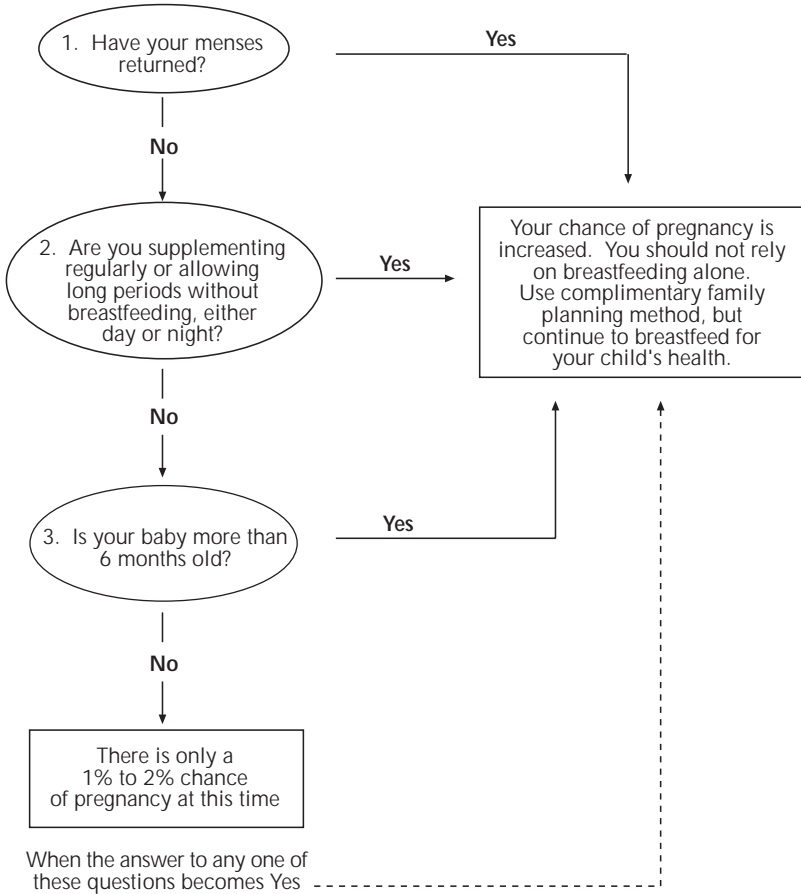
Table 12:2 Complications of breastfeeding and their management (Continued)

Problem	Description	Solution
Plugged duct	Distinct area of breast engorged. Not red, no fever.	Mother should apply moist heat to breast and massage the breast beginning behind the plugged duct and moving toward the nipple. The baby should be breastfed frequently and position changed during each feeding to help dislodge plug.
Leaking	Milk coming from nipple unexpectedly.	This is a normal occurrence. Mother should not stimulate nipple. She should apply pressure directly over nipples with finger, thumb, or brassiere.
Breast infection (Mastitis)	Reddened, tender, localized area of one breast. Fever, flu-like symptoms. Baby may be irritable. Usually caused by staphylococcus.	Keep breast empty. Mother should continue breastfeeding; the infection will not harm baby. Antibiotics appropriate for staph infection should be given. Gently massage affected area while nursing. Moist heat should be applied to the breast, the mother should be urged to drink fluids and to rest in bed. If infection localizes or fever continues, abscess may need draining.
Sore, cracked, fissured nipples ("Nipple trauma")	Tender, reddened nipples, with cracks and occasional bleeding.	Mother should clean breasts with water and expose to heat or sunlight after feedings. Infant should suck for short intervals with frequent feedings and may need assisted feeding until nipples heal. Avoid feeding for long periods of time. Mother can release suction with finger.

Table 12:2 Complications of breastfeeding and their management (Continued)

Problem	Description	Solution
Thrush or moniliasis	Persistently sore nipples (no cracks), inflammation of nipples and areola; baby has white patches in mouth.	Treatment with anti-monilial cream after each feeding if severe. Treat with 1 tsp. baking soda in 1 cup water for mild cases.
Inadequate milk	Baby not gaining weight; sucking not of interest to baby for more than a few minutes at a time.	Check infant attachment to assure sufficient nipple contact. Encourage complete emptying of the breast by expression. The more the mother nurses, the more milk that is produced. Discourage supplementing breast milk in the first months. If there is weight loss and failure to thrive, examine infant in clinic and determine if another method of feeding is warranted.
Flat or inverted nipples	Infant unable to grasp nipple and suckle adequately.	Late in the last trimester is the best time to help flat or inverted nipples to protrude. While supporting the breast, draw out nipple with thumb and index finger. Do 5 to 6 times a day. Use of a milk cup may be helpful in last weeks of pregnancy. <i>CAUTION:</i> too much nipple stimulation late in pregnancy can trigger uterine contractions

Figure 12:2 Use of the Lactational Amenorrhea Method (LAM) for child spacing during the first 6 months postpartum



Source: Labbok et al., (1994)

The perfect-use pregnancy rates during LAM compare favorably with those for other methods of contraception during perfect use. Combining breastfeeding and another method of contraception begun at 6 weeks postpartum (or sooner) should provide even greater protection. (See Table 12:3.)

POSTPARTUM CONTRACEPTION

Because postpartum infertility can be brief and lactational infertility unpredictable, contraceptive counseling should begin in the prenatal period. LAM is a contraceptive method that is begun immediately after delivery. Early postpartum care offers an opportunity to teach mothers how to breastfeed fully, which can lead to the successful use of LAM. In addition, the first postpartum visit, recommended around 4 weeks after delivery, is the focal point of many family planning programs because the woman usually is highly motivated to avoid another pregnancy. This time can be used to review the LAM criteria for continuing the method or for initiating another method of birth control.

CONTRACEPTION FOR THE NONBREASTFEEDING WOMAN

Ideally, the nonbreastfeeding woman should begin using a contraceptive method immediately postpartum or within 4 weeks postpartum. After appropriate counseling and consent, all of the following methods can be initiated in the postpartum period: combined oral contraceptives, progestin-only contraceptives, diaphragm, cervical cap, spermicides, IUD, condoms, and tubal ligation.

For most nonbreastfeeding mothers, there are few precautions for the methods of contraception they can choose. Nonetheless, a few guidelines for clinicians and clients are worth noting:

- Begin any discussion of immediate postpartum sterilization, Norplant insertion, IUD insertion, or Depo-Provera injection well before the delivery. Norplant may be inserted and Depo-Provera may be safely injected postpartum. Discussing these options before delivery will help ensure that consent is fully informed.
- Advise the woman to begin taking combined birth control pills about 2 to 4 weeks after delivery, because the risk of thrombophlebitis and thromboembolism is greatest just after delivery.^{55,90}

Table 12.3 Methods of postpartum contraception

Method	Pregnancy Rates	Advantages	Disadvantages	Comments
Lactational amenorrhea (LAM)	2% if used perfectly	<ul style="list-style-type: none"> Nutritional and anti-infective advantages for the infant Low cost Maternal health benefits 	<ul style="list-style-type: none"> May be ineffective if not used perfectly Additional nutritional demand on mother HIV may be transmitted to infant via breast milk Return of fertility unpredictable Inadequate protection against STIs 	<ul style="list-style-type: none"> Requires patient education Backup method of contraception should be available at all times Mother requires nutrition counseling
Abstinence	0% if used perfectly	<ul style="list-style-type: none"> 100% effective if practiced properly 	<ul style="list-style-type: none"> May be unrealistic for some men and women and in certain cultures 	<ul style="list-style-type: none"> Applies to most couples at varying times
Withdrawal	4% to 19%	<ul style="list-style-type: none"> Very effective method if used correctly Requires no fitting or hormones Inexpensive Can be used anytime and anywhere 	<ul style="list-style-type: none"> Ineffective if used incorrectly 	<ul style="list-style-type: none"> Requires participation of each partner A method all clients should know about and have positive reinforcement Excellent backup method

Table 12.3 Methods of postpartum contraception (Continued)

Method	Pregnancy Rates	Advantages	Disadvantages	Comments
Spermicides/ female barrier methods	6% to 26%	<ul style="list-style-type: none"> No effect on breastfeeding May protect against STIs Can be used immediately postpartum 	<ul style="list-style-type: none"> May be irritating May not be widely available Nonoxynol-9 may be passed in breast milk Can be expensive if used frequently 	<ul style="list-style-type: none"> Cervical cap and diaphragm must be (re)fitted after 6 weeks postpartum
Condoms	3% to 14%	<ul style="list-style-type: none"> Protect against STIs 		<ul style="list-style-type: none"> A male method
Fertility awareness methods	1% to 25% (depends on method)	<ul style="list-style-type: none"> No effect on breastfeeding Can be very effective if used correctly 	<ul style="list-style-type: none"> Mucus changes during lactation are more difficult to interpret Many methods dependent on physiology of ovulation Inadequate protection against STIs 	<ul style="list-style-type: none"> Not recommended until regular menstruation has resumed

Table 12.3 Methods of postpartum contraception (Continued)

Method	Pregnancy Rates	Advantages	Disadvantages	Comments
IUD	0.1% to 2% (depends on type of IUD)	<ul style="list-style-type: none"> No effect on breastfeeding Very effective Postpartum insertion is cheaper, easier, and less painful Can be placed immediately postpartum or interval 	<ul style="list-style-type: none"> Postpartum insertions may have higher risk of expulsion Slight increase in risk of pelvic infection and increased menstrual bleeding Risk of pelvic infection must be assessed Inadequate protection against STIs 	<ul style="list-style-type: none"> Counseling should occur during prenatal visits
Tubal ligation	0.5%	<ul style="list-style-type: none"> Highly effective No direct effect on breastfeeding Can be done immediately postpartum or interval 	<ul style="list-style-type: none"> Anesthesia can temporarily pass into breast milk Involves short separation of mother and infant Is irreversible Requires antepartum counseling Inadequate protection against STIs 	<ul style="list-style-type: none"> Risk of regret is higher in areas of high infant mortality or high rates of divorce or marital dissolution Problems of general anesthesia eliminated with use of regional or local anesthetic
Progestin-only contraceptives (Injectables, implants, minipills)	0.05% to 5% (depends on method)	<ul style="list-style-type: none"> Very effective Does not decrease milk volume Is safe for breastfeeding 	<ul style="list-style-type: none"> Some hormone may pass into breast milk 	<ul style="list-style-type: none"> Recommended waiting until breastfeeding is well established

Table 12:3 Methods of postpartum contraception (Continued)

Method	Pregnancy Rates	Advantages	Disadvantages	Comments
Combined oral contraceptives	0.1% to 5%	<ul style="list-style-type: none"> • Very effective 	<ul style="list-style-type: none"> • Estrogens may reduce milk volume • Mineral content of breast milk may be altered • Hormone may pass into breast milk • Slightly increased risk of thrombophlebitis and thromboembolism immediately after delivery • Inadequate protection against STIs 	<ul style="list-style-type: none"> • Evidence suggests no negative effects on infants from breast milk • May be initiated after 2 weeks postpartum (if not breastfeeding) • Once breastfeeding is well established, low dose pills affect milk volume little

- Avoid use of the diaphragm and cervical cap until 6 weeks after delivery. The risk of toxic shock syndrome increases when bleeding is present. (See Chapter 17 on Vaginal Barriers and Spermicides.) A woman should have her diaphragm or cervical cap refitted at the first postpartum visit.
- Suggest that lubricated condoms are a good option, at least in the short run before the woman is ready for another, preferred contraceptive method.
- Caution women that it may be difficult to practice natural family planning before their cycles are reestablished and cyclic signs of fertility return. Advise them that substantial periods of abstinence are necessary if they do not use a back-up method of contraception.
- Before delivery, discuss the option of inserting the Copper T 380A IUD. Insertion of this IUD within 10 minutes after expulsion of the placenta may be a good option for some women.⁶² However, high rates of IUD expulsion have been noted (see Chapter 15). The LNG 20 IUD is also a good option.
- Inform women about postcoital methods of contraception, where these are available.

CONTRACEPTION FOR THE BREASTFEEDING WOMAN

Lactational amenorrhea method (LAM)

LAM provides effective protection against pregnancy for up to 6 months postpartum. Women who wish to use LAM to avoid becoming pregnant should use another method of contraception as soon as LAM indicates a return to the risk of pregnancy. Breastfeeding women who do not wish to use LAM could begin using contraceptives either immediately after delivery or at the first postpartum examination, preferably no later than 4 weeks after delivery. Clinicians should reinforce breastfeeding and provide appropriate contraceptive services that do not interfere with the woman's ability to breastfeed.

Nonhormonal Methods

Abstinence is 100% effective in preventing pregnancy. A number of cultures promote a period of abstinence postpartum, although the length of abstinence varies. In Nigeria, a period of abstinence often parallels the period of lactation. The husband might sleep in a separate dwelling or with another of his wives. Some mothers observe traditional customs that prohibit intercourse for a long period of time, until some activity of the child marks the end of the abstinent period. For example, some cultures prohibit intercourse until the youngest child can carry a bowl of food to the father, lift a three-legged stool, or walk steadily, all of which might occur between 1 and 2 years of age.

A study in Zaire found a median duration of 4.5 to 8.8 months of postpartum abstinence. The study found that women who were poorer and less urbanized abstained for longer periods of time than did urbanized, wealthier women. The duration of abstinence was also associated with duration of breastfeeding.²⁷ Only 18% of women continued to abstain after they resumed menstruating. In this case, the other 82% would be the target population for family planning methods.

The woman practicing abstinence should be counseled about other contraceptive methods if she desires to resume intercourse. In particular, women should know where and how to obtain emergency contraceptives in case of unprotected intercourse during a fertile time. Assure all women that intercourse will in no way harm milk production unless they become pregnant.

Spermicides and barrier methods have no effect on breastfeeding. The lubricated condom protects against sexually transmitted infections (STIs) and spermicides such as foams, foaming suppositories, creams, and jellies may help offset dryness due to estrogen deficiency. Condoms and spermicides may be used safely even in the immediate postpartum period. However, the diaphragm cannot be refitted until the cervix, vagina, and uterus have involuted. The cervical cap should be refitted at about 6 weeks and should not be used before that time. Some animal studies have found that the spermicide nonoxynol-9 is absorbed through the skin and secreted in very small quantities in breast milk,¹⁰ although no negative effects have been reported.

Charting menstrual cycles and fertility awareness methods (FAM) are not recommended before regular menstruation has resumed. Some FAM rely on detecting minimal changes in cervical mucus and basal body temperature (BBT) to determine whether ovulation has occurred. Once ovulation resumes, some women can detect mucus changes during lactation, but reliable determination of ovulation is more difficult in lactating women than in nonbreastfeeding women. Research is under way to discover what instructions should be given to nursing women using these methods.⁷³ Because BBT cannot be measured unless a woman has at least 6 hours of uninterrupted sleep, mothers who breastfeed at night cannot use FAM that involve recording BBT.⁴⁰ Breastfeeding disrupts fertility signs and symptoms even after menses resume. Thus, a woman may need to have prolonged periods of abstinence when she uses FAM before her regular menstrual pattern returns.⁵⁰

The **IUD** also is an excellent choice for the breastfeeding woman. The copper on the Copper-T does not affect the quantity or quality of breast milk.⁸⁸ (See the following section on Hormonal Methods for information on the IUDs containing natural or synthetic progesterone.) Some women experience mild uterine cramping when they breastfeed with an IUD in place, but the cramping does not usually interfere with lactation or with the effectiveness of the IUD. IUD insertion is less painful and removal rates for pain and bleeding are lower for the lactating mother than for other women.^{8,15}

IUDs may be inserted immediately after expulsion of the placenta or during the first week postpartum, but preferably within 48 hours of delivery. Expulsion rates tend to be higher when IUDs are inserted immediately postpartum, but recent experiences have been very encouraging (see Chapter 15). IUDs inserted postpartum have a pregnancy rate of less than 1% at 12 months postpartum.⁶² Although a few case reports and a small case-control study have suggested that the risk of uterine perforation from IUDs inserted at 6 weeks postpartum is higher among breastfeeding women, other studies have found very low perforation rates in both breastfeeding and nonbreastfeeding women.^{8,15,83}

Tubal ligation is an excellent method for women who do not want to have more children. A tubal ligation can be performed immediately postpartum, although it can disrupt lactation if it requires general anesthesia or separation of mother and infant. Both problems can be minimized by performing the procedure with only local anesthetics and analgesics.⁴⁹ (See Chapter 21 on Voluntary Surgical Contraception.) Women may wish to express and store breast milk before the procedure. For 12 hours following surgery, anesthetics may pass through to the breast milk. During this period, women can express and discard their milk and feed the infant on the stored milk.

Hormonal Methods

The use of hormonal contraception in a lactating woman is an area of dispute among experts.³⁷ All steroids pass through the breast milk to the infant in very small quantities, which have not been shown to be harmful. Estrogens, however, decrease the volume of milk, even in the small doses found in the 30 (and presumably 20) mcg combination oral contraceptives.

Progestin-only contraceptives such as Norplant, the LNg IUD, the Progestasert IUD, Depo-Provera, and minipills (progestin-only pills) appear to have no adverse effects on lactation.^{44,52} Because progestin-only pills do not interfere with the infant's growth and development,^{12,36,44,54,60,67,79} these methods are excellent options for lactating women who wish to postpone a subsequent pregnancy. The methods are simple to use and are highly effective.

Even when they are started in the first week postpartum, minipills have demonstrated no adverse effect on lactation or infant growth.^{54,60} Likewise, studies of Depo-Provera started 2 to 4 days postpartum or at 7 days postpartum⁵² or within 6 weeks postpartum⁴⁵ have found no adverse effects. Two studies of Norplant insertions after 30 days postpartum found no negative effect on psychomotor development and breastfeeding performance.^{79,80} One study found slightly smaller early weight gains among exclusively breastfed infants,⁸⁰ but the other found no difference in infant growth between women given Norplant and control subjects.⁷⁹ (See Chapter 14 on Norplant, Depo-Provera, and Progestin-only Pills.)

Although Norplant and Depo-Provera probably have no adverse effects on lactation or infant health if used immediately postpartum, opinions vary about whether they should be used. Some clinicians worry about early exposure of the infant to progestins, regardless of the amount, although there is no scientific support for this concern. The provider may wish to share this information with the client and wait until breastfeeding has been well established before inserting Norplant rods or giving the Depo-Provera injection. However, if a breastfeeding woman is unlikely to return for a postpartum visit and requests Norplant after delivery (especially if she plans to supplement the infant's diet relatively soon after birth), the contraceptive benefit of using this method would probably exceed the theoretical risks. In the case of Depo-Provera, because the hormonal levels are relatively high in the days immediately following injections, breastfeeding should be well established before injections begin. Immediate postplacental or postpartum insertion of the LNG IUD and the Progestasert IUD have not been studied.

Combined oral contraceptives are not the contraceptive of choice for breastfeeding mothers. Even in low-dose combined pills, the estrogen component reduces the milk supply.^{82,89} Use of combined pills could also change the composition of breast milk, perhaps decreasing its mineral content. Still, the available evidence suggests that use of combined pills during partial nursing does not harm infants.⁸⁹ The appropriate time to provide combined pills to lactating women remains a subject of disagreement. Using low-dose combined oral contraceptives after the first postpartum examination is less likely to interfere with breastfeeding, because lactation has already been established. Nevertheless, milk volume will be reduced. Experts advise against using combined pills when other alternatives, such as the IUD or minipill, are available.²³

Emergency contraception (postcoital) is an option for both breastfeeding women and nonbreastfeeding women who suspect they may have had unprotected intercourse. Women should be aware of these options for preventing pregnancy. Emergency contraceptive pills containing estrogen may have a temporary effect on milk production, although no studies have been conducted in this area. As always, the

woman should be allowed to make an informed choice based on the known risks and benefits. (See Chapter 13 on Combined Oral Contraceptives and Chapter 15 on Intrauterine Devices.)

Effects of Hormonal Contraception on the Breastfed Infant

Although contraceptive steroids taken by the mother can be transferred to the nursing infant through breast milk, the amounts are small. The dose consumed by the infant (the equivalent of one pill for every 4 years of full lactation) is so low that any negative effects on the infant are unlikely.⁴⁹ The main concern is that estrogen suppresses the quantity of milk.

Combined oral contraceptive use during lactation is not the only possible source of estrogen and progestin exposure for the infant. When a mother becomes pregnant and continues to breastfeed her prior infant, that child is exposed to estrogen and progesterone in the mother's milk. Because dairy cattle may be pregnant when they are milked, cow's milk and infant formula made from it may have relatively high levels of estrogen and progesterone.

Although early studies of high-dose oral contraceptives demonstrated some effect of hormones on nursing babies,¹² most of those reports were anecdotal and have not been supported by studies using low-dose pills. However, although the short-term effects of absorbing contraceptive steroids through breast milk appear minimal, the long-term consequences have not been studied.^{26,37,40}

THE ROLE OF FAMILY PLANNING IN BREASTFEEDING

We conclude that the best public health strategy promotes (1) breastfeeding, (2) LAM, (3) the availability of a back-up method to LAM users, and (4) the prompt provision of contraception to women who do not use LAM postpartum, including those who are breastfeeding but do not fit the criteria to rely on LAM. In addition, all women should know about the availability of emergency contraception if the need arises.

Oral contraceptives containing estrogen—even those with low-dose preparations—adversely affect breastfeeding performance^{82,89} and should be discouraged. However, breastfeeding women who are informed of this fact often still choose oral contraception and are even encouraged to do so by clinicians.^{56,72} The challenge for family planning clinicians is to promote both breastfeeding and an appropriate contraceptive method that complements breastfeeding. Breastfeeding and contraception are not physiologically incompatible, although in many societies they might be perceived as incompatible because a lactating woman would not be expected to be sexually active. Nevertheless, many women do resume sexual relations while breastfeeding. The public health challenge is to avoid presenting breastfeeding and contraception as mutually exclusive alternatives and instead to promote them both by emphasizing their health benefits for mothers and children.

INSTRUCTIONS FOR BREASTFEEDING AND FAMILY PLANNING

1. Breastfeeding is a convenient, inexpensive, and nutritious way to feed your baby, and it helps to protect the baby against infection and diarrhea.
2. When you are nursing your child, your own nutrition is important. Eat and drink to satisfy your own hunger and thirst. It is important to take sufficient fluids and extra calcium, iron, and protein in addition to a regular well-balanced diet. You may have to use supplements to get the extra vitamins and iron.
3. If you choose to rely on the lactational amenorrhea method (LAM) as a temporary method of contraception, you must feed your baby frequently and limit supplemental feeds, especially bottles. Begin using another method of contraception when you resume menstruation, when you reduce the frequency of breastfeeds, when you introduce regular supplemental feeds, or when your baby turns 6 months old. Always have a back-up method of contraception available.

4. Use emergency contraception if you have intercourse at a time when you might become pregnant. Postcoital contraception is effective as a one-time method.
5. You can become pregnant while partially breastfeeding your baby, even before having your first menstrual period. If you are breastfeeding and providing regular bottle supplements, begin using a birth control method as soon as your clinician advises, but no later than the time of your first postpartum exam (4 weeks after delivery).
6. If you are not breastfeeding, begin using a birth control method immediately or at the time of the 4-week postpartum visit. You can become pregnant before your first menstrual period after childbirth.
7. Intercourse and menstruation do not reduce the quality and quantity of your breast milk. You do not need to stop breastfeeding because you start having intercourse again or start your period. You can continue breastfeeding when you start using another birth control method and even if you conceive another child. Pregnancy will cause changes in your breast milk, but does not prevent breastfeeding.
8. Use lubricants, such as lubricating jelly, birth control foam, or saliva to make intercourse easier after childbirth. Decreased estrogen production during breastfeeding causes your vagina to lubricate itself more slowly.
9. If you are infected with HIV, the virus that causes AIDS, you could transmit the virus to your baby through breast milk. Talk to a midwife or doctor about the best way to feed your baby. Protect your partner from acquiring HIV, as well. If your partner has the infection, you must still protect both yourself and him from other sexually transmitted infections.

No matter what other methods of contraception a woman is using, if she is at any risk because her partner tests positive for the human immunodeficiency virus (HIV) or because she does not know his HIV status, she should be advised to use plastic or latex condoms with every sexual act. No other contraceptive method besides abstinence provides the same degree of protection.

SPECIFIC COUNSELING ISSUES FOR WOMEN AFTER DELIVERY

- Working women can continue to breastfeed. However, LAM may be a less reliable method for these women because they often have longer intervals between feeding. They should use a complementary method of contraception.
- Women may need a single-decision, long-term contraceptive method (IUD, Norplant, sterilization) if transportation to and from services is a problem. LAM may give the woman time to make necessary arrangements, such as saving money and organizing care for her family, so that she may seek these methods.
- Women with other infants can breastfeed their newborn. Involvement of the other children in the care of the newborn can promote family bonding.
- Some women are concerned that breastfeeding will cause their breasts to sag, while other cultures prize the breast that has "matured." Explain to clients that pregnancy, rather than breastfeeding, is the cause, and that wearing a support brassiere during pregnancy and lactation can diminish sagging.

Table 12.4 Keys to successful breastfeeding

Prenatal period	Early postpartum period	Late postpartum period
<ul style="list-style-type: none"> • Patient and family education • Family support • Supportive and knowledgeable health professionals • Appropriate breast examination • Breast care: <ul style="list-style-type: none"> — No soap or drying agents to nipples and areolas; — Well-fitted cotton brassiere — Nipple conditioning when appropriate — Colostrum expression not recommended — Exposure of breast to air and sunshine may help condition nipple — No excessive nipple manipulation • Good nutrition: <ul style="list-style-type: none"> — Gradual and steady weight gain — No weight reduction diets — Daily supplement of 30 mg of ferrous iron between meals — Limited caffeine intake — No alcohol — No sodium restriction or diuretics • Daily exercise • No smoking 	<ul style="list-style-type: none"> • Awake, alert mother and infant • Immediate (delivery or recovery room) nursing; preferable within 60 minutes of delivery • Proper positioning of the mother and infant; proper infant attachment and removal • Frequent, on-demand feeding, usually every 1 1/2 to 3 hours around the clock for the first several weeks • Sufficient post-milk-ejection nursing (10 to 15 minutes per side) • No formula or water • No artificial nipples or nipple shields • Both breasts used at each feeding. Starting side alternates • Proper breast and nipple care: <ul style="list-style-type: none"> — Breast milk to nipples after each feeding — Adequate air drying after feeding — Only water for cleansing nipples and areolas — Well-fitted cotton nursing bra • Physical and psychological comfort • Good maternal nutrition and hydration: <ul style="list-style-type: none"> — At least 500 extra calories per day — Adequate liquids; drink to satisfy thirst — No universal food restrictions — No high-calorie/low-nutrient foods — Limited postpartum weight loss to 1/2 point per week (2-3 pounds/month). Do not drop below ideal weight for height • Adequate rest (rest or sleep when the baby sleeps) 	<ul style="list-style-type: none"> • Follow-up within 24 to 48 hours after hospital discharge (home visits, phone, or otherwise) • Breastfeeding "expert" available to answer patient questions • Home visiting by nurse or appropriate professional • Encouragement from family friend or community helper for support • Baby's first visit with health care provider within 7 days of hospital discharge

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Combined Oral Contraceptives

Rose was a virgin when she became engaged to Joseph. He was not. Before meeting Rose, Joseph had had intercourse with other women, including prostitutes, and he had been treated at least twice for sexually transmitted infections. However, when Rose and Joseph fell in love, he stopped seeing other women. Rose took oral contraceptives regularly until she and Joseph decided to start a family. When Rose became pregnant, she attended an antepartum clinic. On learning about Joseph's sexual history, the clinician recommended that Rose have an HIV test. The test was positive. Rose was overwhelmed with anger and despair. Rose's and Joseph's future lives have forever changed.

Millions of women in their reproductive years rely on the oral contraceptive (OC) pill, which is a highly effective contraceptive. The combined OC pill, one of the most extensively studied medications, is both safe and effective. In many countries, the pill is now available to women without a prescription. However, the pill provides no protection against sexually transmitted infections (STIs), including the human immunodeficiency virus (HIV). Anyone at risk of becoming infected from or infecting someone else with HIV should use condoms, even if she is already protected from pregnancy by the pill.

The terms “birth control pills,” “pills,” “combined oral contraceptives,” “oral contraceptives,” and “OCs” refer to pills that contain both estrogen and progestin. These terms do *not* refer to progestin-only pills or mini-pills, which are discussed in the next chapter.

OVERCOMING BARRIERS

In some countries, clinical rules and practices create barriers to getting OCs for some women. However, the health risks of pregnancy are far greater than the risks of taking the pill. Thus, many of these clinical rules do not protect women against harmful pill side effects but instead expose them to increased risks of pregnancy. Decrease the barriers to OC use by adapting the following 10 steps to local situations:²

1. At each visit, give the woman enough pills to cover 7 to 20 cycles. If your program policy does not allow this, try to provide at least 3 or 4 cycles of pills. An OC user must *always* have ready access to pills.
2. Do not prescribe a “rest period” just because a woman has taken the pill for several years. Women can use pills as long as they are at risk for pregnancy. However, because pills can increase the risk of thrombophlebitis, stop pills for 2 weeks before major elective surgery. When the woman is able to walk again, she can resume taking the pills.
3. Do not enforce a minimum or maximum age for pills. A woman can use pills for as long as she is at risk for pregnancy. (See exceptions in the section on precautions.)
4. Help make it easy for the woman to remember to take pills. Tell her to begin the first pack of pills on the first day of menstrual bleeding, if possible. Otherwise, she can begin pills within 5 days of the start of her period.
5. Advise use of back-up contraception if a woman is using rifampin or if she is taking any anticonvulsant medication, other than valproic acid. Although there remains some debate on the issue, a

woman taking a broad spectrum antibiotic such as ampicillin or tetracycline should be offered a back-up contraceptive.

6. Prescribe pills for the postpartum period if a woman is *not* breast-feeding. She may start combined pills within 2 to 3 weeks of childbirth.
7. Make it easy to obtain pills. Many countries provide pills without a clinician's prescription. Trained providers (including community-based distribution workers) can initiate and resupply pills, and can make referrals to appropriate facilities if a user has complaints or troublesome symptoms. There are disadvantages to making pills available without prescription: the woman may not return for routine examinations, she may not visit her clinician about problems she is having with the pill, or she may not be a good candidate for pill use but may still choose to purchase and use the pills. On the other hand, the pill is a safe method, especially among the primary users—young, healthy women.
8. Keep checklists short (see Table 13:1 for an example). Select questions to identify which women can receive a limited supply of pills and which should be referred to a clinic.
9. Do not automatically stop the pill if the client is complaining of a single side effect. Consider other causes of that side effect.
10. Prescribe the pill even if the woman does not know how to read. Explain the instructions and have her repeat them to be sure she understands.

MECHANISM OF ACTION

Two estrogenic compounds are used in almost all current OCs: ethinyl estradiol (EE) and mestranol. EE is pharmacologically active, whereas mestranol must be converted into EE by the liver before it is pharmacologically active. Most of the OCs currently prescribed to new patients contain either 30 or 35 mcg of EE. Very few pills containing mestranol are now used. The estrogen and progestin in combined

OCs prevent pregnancy primarily by suppressing ovulation. Estrogenic effects include the following:²⁶

- Ovulation is inhibited.
- Secretions within the uterus and the endometrium are altered.
- The corpus luteum degenerates.

There is scientific debate about the relative potency of the progestins in currently marketed OCs: norethindrone, norethindrone acetate, ethynodiol diacetate, norgestrel, levonorgestrel, desogestrel, norgestimate, and norethynodrel. Levonorgestrel and dextro-norgestrel are the two forms of norgestrel—Levonorgestrel is the active component, and it is twice as potent as dextro-norgestrel. Progestational effects include the following:²⁶

- Ovulation is inhibited.
- Cervical mucus thickens.
- Sperm cannot penetrate the ovum as easily.
- Capacitation of sperm may be inhibited.
- Ovum transport may be slowed or fallopian tube secretions altered.
- Implantation is hampered.²

EFFECTIVENESS

If combined pills are used *perfectly*, only about 1 in 1,000 women will become pregnant within the first year. However, the typical user does not use the pills perfectly. Among users of OCs in the United States, about 5% become pregnant during the first year of typical use. Pill effectiveness can be improved if women reduce the pill-free interval from 7 days to 4 or 5 days.

Many women get pregnant when they discontinue pills, do not begin another method of contraception, and then have unprotected intercourse. Only 50% to 75% of women continue to use pills for 1 year. Because of these high discontinuation rates, it is important to

provide every pill user with a back-up method of contraception, such as condoms. Instruct women on how to use the back-up method and encourage them to practice using it.

Because most women who discontinue pills have not developed a complication or major side effect, you should try to reduce the barriers to successful pill use (see previous section). Explain how pills are to be started and used, and make certain the client understands. It is essential that the new pill user know when to take the first pill, what to do if she misses a pill, and where to return for supplies. She should be informed that spotting and some nausea are most likely to occur in the first cycle or so and that they tend to decrease over time.

ADVANTAGES AND INDICATIONS

ADVANTAGES

1. **Highly effective.** When taken consistently and correctly, pills are a very effective contraceptive that give women control over their own fertility.
2. **Very safe.** Low-dose combined pills (pills with 20 to 35 mcg of estrogen) are very safe for almost all women. It is safer to use pills than to become pregnant and deliver a baby. An African woman's risk of dying from pregnancy ranges from 100 to 1,500 maternal deaths for every 100,000 live births.³⁸ The risk of death from OCs is close to zero if heavy smokers over 35 years of age do not take pills.¹⁵ Pills are one of the most researched medications ever prescribed.
3. **A contraceptive option throughout the reproductive years.** Most women can safely use pills throughout their reproductive years. A rest period every few years is definitely not recommended for women who wish to continue using pills.
4. **Excellent reversibility.** Pills are an excellent option for women who want to become pregnant in the future. Pills protect future fertility, as they prevent ovarian cysts, many forms of pelvic inflammatory disease (PID), ectopic pregnancy, progression of endometriosis, and growth of uterine fibroids.

5. **Beneficial menstrual cycle effects.**

- Pills decrease menstrual cramps and pain. Some women consider these to be the most desirable effect of OCs.
- Pills prevent ovulation and, therefore, ovulation pain (mittelschmerz) in most women.
- Pills decrease the number of days of menstrual bleeding.
- Pills decrease menstrual flow by 60% or more in women with a normal uterus.²⁶ Therefore, pill users are less likely to develop iron-deficiency anemia.
- Pills reduce the incidence of functional ovarian cysts by 80% to 90%.^{14,22} Very low-dose pills (pills with 20 to 30 mcg of estrogen and lowest dose progestin pills) provide less protection against functional ovarian cysts.¹⁴
- Pills can reduce premenstrual symptoms such as anxiety, depression, headaches, and fluid retention for some women.¹⁴ For other women, however, these symptoms may become worse.

6. **Prevention of ovarian and endometrial cancer.** By age 55, a woman is less likely to be diagnosed with cancer if she used pills than if she did not. Women who have used combined OCs for 4 years or less are 30% less likely to develop ovarian cancer than women who have never used the pill. Women who used pills for 5 to 11 years are 60% less likely; and if they used them for 12 or more years, 80% less likely. This protection lasts for at least 10 years after pills have been discontinued. Women who start using OCs at an early age and continue for a long time may be more protected than women who start using pills at an older age.¹⁵ Because ovarian epithelial cancer is more likely to occur in certain families,¹⁹ a strong family history for this type of ovarian cancer might be considered an indication for using OCs. Pill users have about half the risk of nonusers of developing endometrial cancer.^{6,13,15} The protective effect lasts for at least 10 years after pills have been discontinued.

7. **Decreased risk for benign breast cysts and fibroadenomas.** Pill users are less likely to develop benign breast tumors than are women who do not use the pill.²²
8. **Prevention of ectopic pregnancy.** By stopping ovulation, pills prevent all conceptions, including those that implant outside the uterus (ectopic pregnancies). Ectopic pregnancy is an important cause of maternal mortality throughout the world.
9. **Prevention of pelvic infection.** The combined oral contraceptive pill protects against PID, a major cause of female infertility.^{15,25} Pill users are less likely to develop the more severe forms of PID than are users of other contraceptives. However, pills may not protect women against all forms of PID, especially the more chronic, subclinical type caused by *Chlamydia trachomatis*. Indeed, evidence suggests that pills may enhance cervical infections with *C. trachomatis*, possibly offsetting the protective effects of OCs against PID.³¹
10. **Reduction of acne and hirsutism.** Combined OCs lower serum testosterone levels and tend to reduce acne and hirsutism.^{14,26}
11. **Increased enjoyment of sexual intercourse.** Probably because the fear of pregnancy is diminished, many couples who rely on the pill enjoy sexual intimacy more. However, in some women, the pill has just the opposite effect.
12. **Improvement of estrogen deficiency symptoms.** Pills suppress follicle stimulating hormone and luteinizing hormone and prevent hot flashes in women in their 40s. Pills have been shown to have similar beneficial effects in preventing osteoporosis.
13. **Management of endometriosis.** Pills have been used in preventing the progression of endometriosis.^{14,26,27}
14. **Easily obtainable.** In many countries, pills are available at a low cost and without a prescription. The price and availability of pills vary greatly from country to country.
15. **Prevention of hospitalization.** The use of combined OCs prevents more hospitalizations than it causes (see Figure 13:1). In the United States, the protective effects of pills prevent an estimated 1,614 hospitalizations per 100,000 current pill users.¹⁴

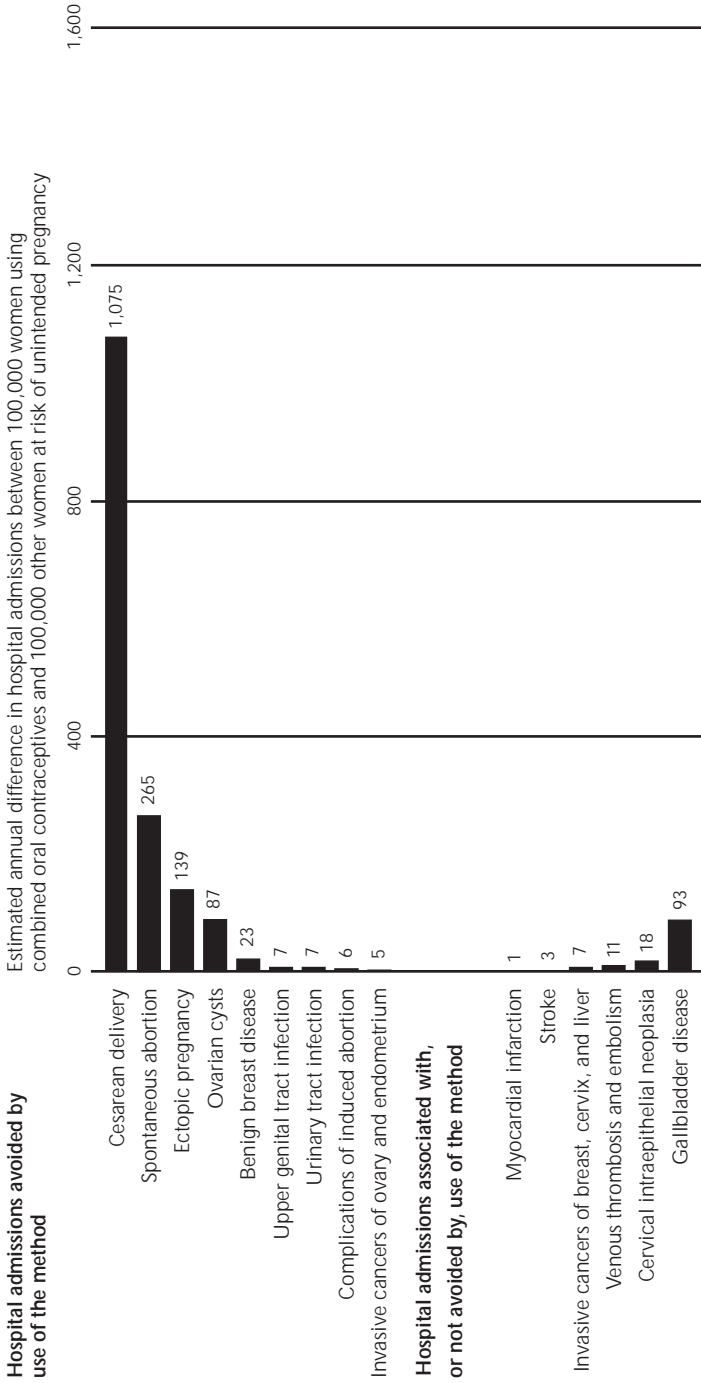
16. **Use as emergency contraception.** Some types of combined pills given within 72 hours of unprotected intercourse reduce the risk of pregnancy by 75%.²⁹ Emergency contraception is used *after* intercourse but *before* pregnancy occurs. Emergency contraceptive pills (ECPs) have a higher than usual dose of oral contraceptives. When taken within 72 hours after unprotected intercourse, ECPs can interrupt fertilization and implantation. One dose is taken soon after intercourse, and a second dose is taken 12 hours later. (See Table 13:1.) Emergency contraception should not be a routine form of protection for women.

About half the women who use ECPs report nausea; about 20% vomit. Nausea and vomiting can be prevented by anti-nausea medications such as dimenhydrinate and cyclizine hydrochloride.

Table 13:1 Oral contraceptive pills available in Africa that can be used as emergency contraceptive pills

Brand Name	First dose within 72 hours of intercourse	Second dose 12 hours after first dose
Anteovin	2 tablets	2 tablets
Eugynon	2 tablets	2 tablets
Eugynon-30	4 tablets	4 tablets
Eugynon-50	2 tablets	2 tablets
Lo-Femenal	4 tablets	4 tablets
Lo-Rondal	4 tablets	4 tablets
Logynon	4 tablets	4 tablets
Microgynon	4 tablets	4 tablets
Microgynon-30	4 tablets	4 tablets
Microvlar	4 tablets	4 tablets
Minidril	4 tablets	4 tablets
Neogynon	2 tablets	2 tablets
Nordette	4 tablets	4 tablets
Nordiol	2 tablets	2 tablets
Normovlar	2 tablets	2 tablets
Ovidon	2 tablets	2 tablets
Ovral	2 tablets	2 tablets
Primovlar	2 tablets	2 tablets
Rigevidon	4 tablets	4 tablets
Stediril	2 tablets	2 tablets
Trinordiol	4 tablets	4 tablets
Triovlar	4 tablets	4 tablets
Triquilar	4 tablets	4 tablets

Figure 13:1 Use of combined oral contraceptives prevents many more hospital admissions than it adds



Source: Harlap et al. (1991) with permission of the Alan Guttmacher Institute.

INDICATIONS

Pills are a particularly attractive contraceptive option for women who are motivated to use a method that requires a daily routine and who have some of the following characteristics:

- Nulliparous
- Young, sexually active
- Not at risk for STIs, including HIV
- Desiring spontaneous intercourse
- Nonlactating, postpartum
- Desiring a reversible method
- Bothered by heavy or painful periods
- Acned, hirsute, or having oily skin
- Having a strong family history of ovarian cancer

DISADVANTAGES AND CAUTIONS

Pills provide no known protection against HIV infection. Women who may be at risk for HIV infection should use condoms alone or condoms with the pill. (Abstinence and long-term mutually faithful relationships are the safest approaches to avoiding HIV infection transmitted by intercourse.)

1. **Challenge of daily compliance.** Some women may find it complicated to take pills every day. If a woman runs out of her supply of pills, her contraceptive protection will stop.
2. **Expense.** Pills are not always available or affordable.
3. **Unwanted menstrual cycle changes.** Pills may be associated with menstrual changes such as missed periods, very scanty bleeding, spotting, and breakthrough bleeding. These changes usually resolve in 3 to 4 cycles. Some women find these menstrual cycle changes distressing. (Combined OCs cause fewer bothersome menstrual cycle changes than do progestin-only pills, Norplant implants, or progestin-elaborating intrauterine devices [IUDs].)
4. **Nausea or vomiting.** Nausea may occur in the first cycle or so of pill use or, less commonly, in subsequent cycles.

5. **Headaches.** Headaches may start in a woman with no history of headaches or they may become worse than they were before pills were started. On rare occasions, changes in vision accompany the headaches. If a woman loses her vision while using pills, she should discontinue their use.
6. **Depression.** In some women, pills may stimulate depression (sometimes severe) and other mood changes.
7. **Decreased libido.** Some women on pills experience a decreased interest in sex or a decreased ability to have orgasms. Decreased libido may be due to decreased levels of free testosterone due to OC use.
8. **Cervical ectopia and chlamydia infection.** Chlamydial cervicitis may be more common in women taking pills.^{26,31} Pills can cause cervical ectopia, a condition in which the delicate mucus-secreting columnar cells that normally line the cervical canal cover part of the external surface near the opening of the cervical canal. Chlamydia thrives inside these columnar cells, making the cervix more vulnerable to *C. trachomatis* infection. However, there is no evidence to suggest this increased risk for chlamydial infection places women at greater risk for PID.
9. **Thrombophlebitis, pulmonary emboli, and other cardiovascular diseases.** Circulatory diseases are the most serious complications attributable to oral contraceptive use.^{14,27} Fortunately, serious complications are extremely rare with low-dose combined OCs. Clinically significant hypertension has been associated with both estrogen and progestin in pills. However, it is not certain whether clinically significant hypertension is caused by OCs. If a woman's diastolic blood pressure rises above 90 mmHg on several visits, discontinue her pills or change to a lower dose. It may be appropriate to switch her to a progestin-only pill. Hypercoagulability and thrombosis are associated with exogenous estrogens. Atherogenesis is prevented by estrogens, which tend to have desirable effects on lipids, increasing high-density lipoproteins (HDLs) and decreasing low-density lipoproteins (LDLs). Androgens and some progestins have just the opposite effect on HDLs and LDLs. Recent changes in OC formulations have lowered the progestins in OCs and have led to new formulations capable of

producing a more favorable lipoprotein pattern than a woman had before using pills. The "new progestins," which contain desogestrel, gestadene, or norgestimate, lead to a favorable HDL:LDL ratio.¹¹

A woman's risk for circulatory disease is most influenced by characteristics unrelated to pill use—factors such as smoking, weight, and cholesterol levels. Cardiovascular disease is most likely to occur in women who:

- *Smoke*
- *Are overweight*
- *Get little physical exercise*
- *Are over 50 years of age*
- *Are hypertensive, diabetic, or have a history of heart or vascular disease*
- *Have a family history of diabetes or heart attack in a relative under the age of 50*

10. **Carbohydrate metabolism.** Carbohydrate metabolism is not significantly affected by the current low-dose pills. Low-dose combined pills may be provided to some women with a history of gestational diabetes, a family history of diabetes, and, in some instances, insulin-dependent diabetes.
11. **Gallbladder disease.** Recent studies conclude that OCs are not an important risk factor for the development of gallstones or gallbladder cancer. However, although pills do not cause gallstones, they may speed the development of gallbladder disease in women who already are susceptible, such that problems become evident earlier.^{14,26}
12. **Hepatocellular adenomas.** Benign liver tumors have been associated with the use of combined OCs. However, with the current low dose pills, the risk of liver tumors is much lower than with higher dose pills, and pill users may bear no greater risk of these tumors than do nonusers.
13. **Breast cancer and other types of cancer.** By age 55, women who used pills are no more likely to be diagnosed with *breast cancer*

than are women who did not use pills. However, there may be a group of young women who have used pills that are at greater risk of having breast cancer diagnosed before the age of 35.^{15,33} Seven of 13 epidemiologic studies found no significantly increased risk of cervical neoplasia in OC users, and five found a statistically increased risk.^{24,30} A link between OCs and benign hepatocellular adenomas was established several years ago.²³ An association between OCs and hepatocellular carcinoma is less certain.^{10,12,17,28} Pills probably have no effect on a woman's likelihood of developing a malignant melanoma; kidney, colon, or gallbladder cancer; or pituitary tumors.^{15,17,20}

14. **Decreased milk supply.** Combined OCs are not the contraceptive of choice for breastfeeding mothers. The estrogen in combined pills, even in low-dose pills, reduces milk supply.³² Use of combined pills may slightly alter the composition of breast milk; most studies report declines in mineral content. Nevertheless, the use of combined OCs while nursing does not harm infants.³²
15. **Other side effects.** Women using pills may experience a variety of other side effects including breast fullness or tenderness, increased facial pigmentation, acne, weight gain, and hair loss.

PROVIDING COMBINED PILLS

Each country needs to develop its own protocols for providing and following up women who receive the pills. Suggestions that may help establish protocols are listed below. For most women, the advantages of combined pills clearly outweigh the risks and disadvantages. However, you should avoid giving pills to women who may have conditions that increase risk. To further reduce any risks and disadvantages of pill use, do not provide pills with more than 35 mcg of estrogen to these women and prescribe pills with low dosages of progestin.

Because misinformation about OCs is widespread, clearly explain the noncontraceptive benefits of pills, how to use them, and what to do if problems with the pill should occur. Encourage all smokers to stop smoking.

INITIAL VISIT

Weight, blood pressure, a Papanicolaou (Pap) smear, and pelvic examination are desirable screening tests for all women. For most women, however, they are *not necessary to start taking pills*. At the minimum, measure blood pressure and use a checklist to evaluate clients annually.

FOLLOW-UP VISITS

Each clinic must decide what medical history should be taken each time a woman returns for a pill refill. Brief, self-administered questions can help the pill user decide whether she should stop using pills if she develops medical problems or experiences a danger sign. (See Table 13:1 on The Pill Checklist.)

Some programs re-evaluate women after their first 3 to 6 months of pill use. Although this is not medically necessary, evaluation is an opportunity for the woman to ask questions about the pill. If a woman has used the pill for 3 to 6 months, is having no problems, and wants to continue the pill continuously, seven packets (a 6-month supply) may be provided. After a woman has used pills for 1 year, a full year's supply of pills may be provided to discourage pill discontinuation.

Table 13:2 Checklist for the provision of combined oral contraceptive pills

Do you have symptoms of pregnancy NOW?	___	YES	___	NO
Have you ever been told NOT to take pills?	___	YES	___	NO
Have you ever had a blood clot, a heart attack, or a stroke?	___	YES	___	NO
Have you had severe headaches or severe chest pain since starting birth control pills?	___	YES	___	NO
Have you developed blurred vision or loss of vision since taking the pill?	___	YES	___	NO

If the answer to any of these questions is "yes," discuss them with your clinician.

CHOOSING A COMBINED ORAL CONTRACEPTIVE: WHICH COMBINED PILL TO PRESCRIBE

How does a clinician decide which of the many pills to prescribe for an individual woman? A flow sheet (see Figure 13:2) can help. Any of the sub-50 mcg pills may be used by most women.

OCs provide no protection against STIs, including HIV infection. Counsel women (and men) to use condoms until they become committed to a long-term, mutually faithful relationship with someone they know is not infected. Consider providing both an OC pill and condoms.

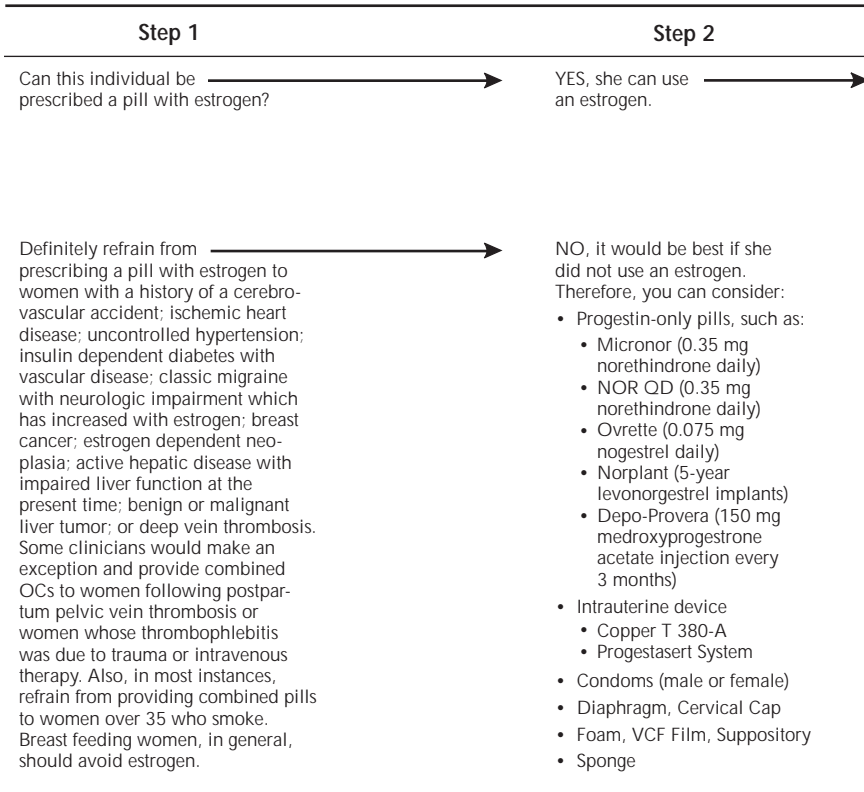
Indications and precautions (Step #1)

Some women should not take an OC with an estrogenic component. Avoid prescribing pills to women who have conditions that place them at greater risk of complications. (See Table 13:3 and Figure 13:2.) On the other hand, today's OCs are suitable for several categories of women who have been denied prescriptions in the past:

Women over 35 years of age

Today's pills are available in much lower doses and appear to be a safe contraceptive choice for women over 35 who do not smoke or have hypertension, diabetes, or hypercholesteremia.^{14,21,26} Women may take the pill until age 50, as long as they have no complications or risk factors. Screening tests such as mammography and cholesterol determinations that might reveal complications, however, are unavailable for most women in the world. Pills should not be withheld from women when these tests are not available, unless a woman has other reasons to avoid pill use.

Figure 13:2 Choosing a combined oral contraceptive



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The following individuals assisted in the development of this flow chart:
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Figure 13:2 Choosing a combined oral contraceptive (Continued)

Step 3			Step 4
Therefore, you may choose between any of the following OCs based on: <ul style="list-style-type: none"> • Number of micrograms of ethinyl estradiol • Availability of pill • Ease of remaining on schedule because of pills • Price of pills to clinic • Price of pills to client • Prior experience of this individual woman or the clinician caring for this woman with a special pill Pills are listed from the lowest to the highest number of micrograms of ethinyl estradiol:			Other clinical considerations that might help in OC choice:
Combined Pill	Estrogen (mcg)	Availability/Cost In Your Clinic	Company
Loestrin 1/20	20	_____	Parke-Davis
Loestrin 1.5/30	30	_____	Parke-Davis
Desogen	30	_____	Organon
Lo-Ovral	30	_____	Wyeth
Nordette	30	_____	Wyeth
Levlen	30	_____	Berlex
Ortho-Cept	30	_____	Ortho
Tri-Levlen	30/40/30	_____	Berlex
Triphasil	30/40/30	_____	Wyeth
Ovcon 35	35	_____	Mead Johnson
Demulen 1/35	35	_____	Searle
Ortho-Cyclen	35	_____	Ortho
Ortho Tri-Cyclen	35	_____	Ortho
Ortho Novum 777	35	_____	Ortho
Ortho-Novum 1/35	35	_____	Ortho
Modicon	35	_____	Ortho
Brevicon	35	_____	Syntex
Norinyl 1/35	35	_____	Syntex
Tri-Norinyl	35	_____	Syntex
Norcept-E 1/35**	35	_____	Syntex
Nelova 0.5/35**	35	_____	GynoPharma
Nelova 1/35**	35	_____	Warner-Chilcott
NEE 0.5/35	35	_____	Lexis
NEE 1/35	35	_____	Lexis
Genora 0.5/35**	35	_____	Rugby
Genora 1/35	35	_____	Rugby
Jenest	35	_____	Organon
NEE 10/11	35	_____	Lexis
Norethin 1/35E	35	_____	Schiaparelli-Searle

- Other clinical considerations that might help in OC choice:
- To minimize the potential risk for *thrombosis* due to estrogen in a woman 40–50 years of age or a woman at increased risk for thrombosis due to another cause (e.g., diabetic or heavy smoker), prescribe:
 - Loestrin 1/20
 - To minimize *nausea, breast tenderness, vascular headaches*, and estrogen-mediated side effects, prescribe:
 - Loestrin 1/20
 Or a 30 mcg pill, such as:
 - Desogen
 - Levlen
 - Loestrin 1.5–30
 - Lo-Ovral
 - Nordette
 - Ortho-Cept
 - To minimize *spotting and/or breakthrough bleeding*, prescribe:
 - Lo-Ovral, Nordette, or Levlen
 - A new progestin pill: Desogen, Ortho-Cept, Ortho-Cyclen, or Ortho Tri-Cyclen
 - To minimize androgen effects such as *acne, hirsutism, oily skin, sebaceous cysts, pilonidal cysts, or weight gain*, prescribe:
 - Desogen, Ortho-Cept
 - Ortho Tri-Cyclen
 - Ortho Cyclen
 - Ovcon-35, Brevicon, or Modicon (of norethindrone pills)
 - Demulen-35 (of ethnodiol diacetate pills)
 - To produce the most *favorable lipid profile*, prescribe:
 - Ortho Cyclen or Ortho Tri-Cyclen
 - Desogen or Ortho-Cept
 - Ovcon-35, Brevicon, or Modicon (of norethindrone pills)

Contraceptive Technology 1994–1996

Table 13:3 Precautions in the provision of combined pills

Low-Dose Oral Contraceptives (COCs) Containing <50µg of Ethinyl Oestradiol		
Condition	Category	Rationale/Comments
Pregnancy	4	As no method is indicated, any health risk is considered unacceptable. However, there is no known harm to mother or fetus if OCs are used during pregnancy.
Breastfeeding		
<6 wks postpartum	4	Theoretical concern regarding association of OC use and risk of thrombosis. Concern that immature neonate may be at risk of exposure to steroid hormones.
6 wks to 6 mths postpartum (primarily breast-feeding)	3	Use of OCs during breast-feeding diminishes the quantity of breast milk and may adversely affect the health of the infant.
>6 mths postpartum	2	
Age		
Menarche—age 40	1	Theoretical concern about the use of OCs among young adolescents has not been substantiated by scientific evidence.
>Age 40	2	The health risk:benefit ratio may change for women with certain risk factors for cardiovascular disease, particularly among women above age 40.
Smoking		
Age <35	2	Age modifies the risk associated with smoking.
Age >35		
light	3	The risk:benefit ratio changes particularly among women who are heavy smokers.
heavy (>20 cigarettes/day)	4	
Essential hypertension		
140-159/90-99	2/3	OC causes only small changes in blood pressure among non-hypertensive women. Primary concern is risk of underlying vascular disease and additional risk of thromboembolism.
160-179/100-109	3/4	
180+/110+	4	
Moderate and severe hypertension	3	
Vascular disease	3/4	The health risk:benefit ratio depends on the severity of the condition.

1 = used in any circumstances

2 = generally used

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Table 13:3 Precautions in the provision of combined pills (Cont.)

Low-Dose Oral Contraceptives (COCs) Containing <50µg of Ethinyl Oestradiol		
Condition	Category	Rationale/Comments
History of pre-eclampsia	1	Absence of underlying vascular disease suggests no need for restriction of OC use.
Diabetes		
History of gestational disease	1	Not a concern; no need for restriction of OC use.
Non-vascular disease: non-insulin dependent	2	Although carbohydrate tolerance may change with OC use, major concern is vascular disease and additional risk of thrombosis.
insulin dependent	2	
Nephropathy/retinopathy	3/4	
Other vascular disease or diabetes of >20 years' duration	3/4	
Venous thromboembolism (VTE)		
Current and history of VTE	4	
Major surgery with prolonged immobilization	4	The increased risk of venous thromboembolism associated with OC should have little effect on healthy women, but may have substantial impact on women otherwise at risk for thromboembolism.
without prolonged immobilization	2	
Minor surgery without immobilization	1	
Varicose veins	1	
Superficial thrombophlebitis	2	
Current and history of ischemic heart disease	4	Among women with underlying vascular disease or demonstrated predisposition to thrombosis, the increased risk of thrombosis with OC should be avoided.

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Table 13:3 Precautions in the provision of combined pills (Cont.)

Low-Dose Oral Contraceptives (COCs) Containing <50µg of Ethinyl Oestradiol		
Condition	Category	Rationale/Comments
Stroke		
Current (in hospital)	4	Among women with underlying vascular disease or demonstrated predisposition to thrombosis, the increased risk of thrombosis with OC should be avoided.
History	4	
Severe hyperlipidemia	3	Although these conditions are risk factors for vascular disease, routine screening is not needed and is inappropriate because of the rarity of the conditions and cost of screening.
Valvular heart disease		
Uncomplicated	2	Use of OC in complicated valvular heart disease is likely to increase the risk of embolic phenomenon.
Complicated (pulmonary hypertension, risk of arterial fibrillation, history of SBE)	4	
On anticoagulant drugs	3/4	Among women with underlying thromboembolic condition or predisposition to thrombosis, any increased risk of thrombosis with OC should be avoided.
Headaches		
Mild	1	Not a concern, no need for restriction of OC use.
Severe		
recurrent, including migraine, <i>without</i> focal neurologic symptoms	2	Focal neurologic symptoms may increase the risk of stroke.
recurrent, including migraine, <i>with</i> focal neurologic symptoms	4	
Irregular menstrual patterns (cyclic pattern maintained)		
<i>Without</i> heavy bleeding	1	Changes in menstrual bleeding patterns are common among healthy women.
<i>With</i> heavy bleeding	1	

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Table 13:3 Precautions in the provision of combined pills (Cont.)

Low-Dose Oral Contraceptives (COCs) Containing <50µg of Ethinyl Oestradiol		
Condition	Category	Rationale/Comments
Unexplained vaginal bleeding (cyclic pattern disrupted)		
Before/during evaluation	3	Evaluation of the underlying pathological condition (such as pregnancy, pelvic malignancy) is necessary.
After evaluation	**	
Breast disease		
Undiagnosed mass	2	
Benign breast disease	1	No concern related to COC use for women with benign breast disease or family history of breast disease.
Family history of cancer	1	
Cancer		Breast cancer is a hormonally sensitive tumor. The risk for progress of the condition may be increased among women with current or past history of breast cancer.
current	4	
past but no evidence of current disease for 5 years	3	
Cervical intraepithelial neoplasia (CIN)	2	Little concern that OC enhances progression of CIN to invasive disease.
Cervical cancer (awaiting treatment)	2	Theoretical concern that OC use may affect prognosis of the existing disease.
Cervical ectropion/erosion	1	Not a risk factor, no need for restriction of OC use.
Endometrial, ovarian cancer	1	OC use reduces the risk of developing endometrial and ovarian cancer. (In general, treatment of these conditions renders a woman sterile. While awaiting treatment, women may use OC.)

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Table 13:3 Precautions in the provision of combined pills (Cont.)

Low-Dose Oral Contraceptives (COCs) Containing <50µg of Ethinyl Oestradiol		
Condition	Category	Rationale/Comments
Pelvic inflammatory disease (PID)		OCs provide protection against PID.
Past (assuming no current risk factors of STIs) with subsequent pregnancy after past PID	1	
without subsequent pregnancy; however, pregnancy is desired	1	
without subsequent pregnancy; and pregnancy is not desired	1	
Within the last 3 months	1	
Purulent cervicitis	1	
Trachomatis or <i>N. Gonorrhoea</i>	1	
Vaginitis without purulent cervicitis	1	
Increased risk of STIs (e.g. multiple partners or partner who has multiple partners)	1	
STIs: current or within 3 months	1	Not a concern, no need for restriction of OC use.
HIV/AIDS		
HIV+	1	No confirmation of an association of OC use with these conditions.
High risk of HIV infection	1	
AIDS	1	

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Table 13:3 Precautions in the provision of combined pills (Cont.)

Low-Dose Oral Contraceptives (COCs) Containing <50µg of Ethinyl Oestradiol		
Condition	Category	Rationale/Comments
Biliary tract disease		
Symptomatic		
surgically treated	2	Estrogen component of OC accelerates the development of symptoms of gall bladder disease.
medically treated	3	
current	3	
Asymptomatic	2	
History of cholestasis		
Pregnancy-related	2	History of pregnancy related cholestasis may predict an increased risk of developing OC associated cholestasis.
Past OC-related	3	
Viral hepatitis		
Active		Because OC is metabolized by the liver, its use may adversely affect women whose liver function is already compromised.
symptomatic	4	
asymptomatic	3	
Carrier	1	In women with symptomatic viral hepatitis, OC should be withheld until liver function returns to normal or until 3 months after the woman becomes asymptomatic.
Cirrhosis	3/4	Because OC is metabolized by the liver its use may adversely affect women whose liver function is already compromised.
Liver neoplasia		
Benign (adenoma)	4	OC is metabolized by the liver, and use may affect prognosis of the existing disease.
Malignant (hepatoma)	4	OC use substantially increases the risk of hepatoma.
Schistosomal fibrosis	1	OC use is not known to predispose to schistosomal fibrosis.
Uterine fibroids	1	OCs provide protection against uterine fibroids.

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Table 13:3 Precautions in the provision of combined pills (Cont.)

Low-Dose Oral Contraceptives (COCs) Containing <50µg of Ethinyl Oestradiol		
Condition	Category	Rationale/Comments
Past ectopic pregnancy		
Subsequent pregnancy desired	1	OCs provide protection against ectopic pregnancy.
Subsequent pregnancy not desired	1	
Obesity	1	Not a concern, no need for restriction of OC use.
Thyroid		
Simple goiter	1	Not a concern, no need for restriction of OC use.
Hyperthyroid	1	
Hypothyroid	1	
Trophoblast disease (current and recent history)	1	Not a concern, no need for restriction of OC use.
Sickle cell disease	2	Not a concern, no need for restriction of OC use.
Iron deficiency anaemia	1	OC use may decrease blood loss. No need for restrictions of OC use.
Epilepsy	1	The condition per se is not a concern. No need for restriction of OC use. Certain antiepileptic drugs lower OC efficacy. If a woman is taking treatment, refer to section on drug interactions.
Schistosomiasis	1	
Malaria	1	Not a concern, no need for restriction of OC use.

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Table 13:3 Precautions in the provision of combined pills (Cont.)

Low-Dose Oral Contraceptives (COCs) Containing <50µg of Ethinyl Oestradiol		
Condition	Category	Rationale/Comments
Drug interactions		
Commonly used drugs which affect liver enzymes: antibiotics (rifampicin and griseofulvin)	3	Commonly used liver enzyme inducers are likely to reduce the efficacy of OCs.
anticonvulsants (phenytoin, carbamazepine, barbiturates, primadone)	3	Use of other contraceptives should be encouraged for women who are on long-term use of any of these drugs.
Other antibiotics	1	
Parity		
Nulliparous	1	Not a concern. No need for restriction of OC use.
Parous	1	
Rapid return to fertility desired	1	Not a concern. No need for restriction of OC use.
Severe dysmenorrhoea	1	OC use may decrease or alleviate symptoms of dysmenorrhoea. No need for restriction of OC use.

Source: WHO (1996)

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Smokers

It is not required or wise to withhold pills from all women who are heavy smokers but have no other reasons to avoid pill use. Encourage smokers to stop smoking. Explain that cigarette smoking interacts with OCs to increase a woman's risk of myocardial infarction, stroke, and other clotting injuries. Teach the warning signs when using pills.

Young women

An adolescent woman can start taking the pill when she becomes sexually active or considers becoming sexually active. The medical and social risks of pregnancy at a young age exceed the risks of taking OCs, even if menstrual periods have not begun. No evidence suggests that the estrogen in current low-dose OCs can limit height due to premature closure of the epiphyses, even in adolescents who have not begun menstruating. In menstruating adolescents, epiphyseal closure is well under way. Tell the young woman who has had very irregular periods or very late onset of menses that OCs will make her menses more regular, but that when she stops her OCs in the future to become pregnant, her periods may become irregular again and that becoming pregnant could take a number of months.

Because adolescent pill users may stop using pills because of minor side effects such as nausea or spotting, take all minor side effects in adolescents seriously. If nausea or vomiting is a problem, prescribe a 20 mcg pill, the lowest estrogen pill available, or a progestin-only pill. If acne is a particular concern, one of the new progestin pills may be the best choice, but all pills are likely to have a beneficial effect on acne.

Postpartum/lactating women

Because pills may decrease the amount of milk a breastfeeding woman produces, most women should begin pill use after the baby has been weaned. The progestin-only pill is probably a better choice than the combined pill for these women. Contraceptive choices for breastfeeding women are discussed extensively in Chapter 12 on Lactation and Postpartum Contraception and in Chapter 14 on Norplant, Depo-Provera, and Progestin-Only Pills.

Alternative options (Step #2)

If a woman should not take estrogen, consider all alternative contraception options, including progestin-only methods and IUDs.

Selection (Step #3)

Select any sub-50 mcg combined pill based on its availability, cost, or on the prior experience of the client or clinician. No single OC is clearly better than all the rest. Today's combined OCs contain far less estrogen or progestin than pills of a generation ago. Most of the noncontraceptive benefits of combined OCs appear to occur in women using low-dose pills.

Price. It is appropriate to consider price in choosing a pill. Cost influences decisions about which pill to provide, along with clients in deciding whether they can use the pill successfully. Find out where clients can obtain pills most inexpensively.

Dose. Start with the lowest dose pill available:

- A 20 mcg (unavailable in most clinics in Africa) or a 30 mcg pill
- A pill with just 0.4 or 0.5 mg of norethindrone rather than 1 mg of norethindrone found in 1+35 pills
- The pills with the lowest amount of levonorgestrel available to your clinic

Clinical considerations (Step #4)

The estrogenic, progestational, and androgenic effects of OCs affect a number of organs and tissues throughout the body (skin, uterus, ovaries, brain, breasts, arteries, veins, etc.). A pill may stimulate a specific organ in a woman quite differently than the natural (endogenous) hormones the woman produced before she began using OCs. A specific pill may suppress hormone production or affect one organ system or tissue differently in two different women. But, there are ways to minimize a woman's risk of specific side effects or metabolic changes brought about by pills:

Thrombosis. The most serious complication to avoid is thrombophlebitis. A client at an increased risk of thrombophlebitis should use the pill with the least estrogenic potency, such as a 20 or 30 mcg pill.

Estrogenic side effects. Most women using pills with less than 50 mcg of EE do not experience one of the estrogen-mediated side effects, which include the following:^{9,14}

- Nausea
- Increased breast size
- Leukorrhea (whitish vaginal discharge)
- Cervical ectopy (growth of columnar cells onto the surface of the cervix)
- Thromboembolic complications (blood clots)
- Hepatocellular adenomas (benign liver tumors)
- Growth of leiomyomata (fibroids)
- Telangiectasia (superficial vessels on the skin)

Estrogen- and progestogen-associated side effects include the following:

- Breast tenderness
- Headaches
- Hypertension
- Myocardial infarction

Spotting. Spotting and breakthrough bleeding are more likely to occur when women use lower dose pills. These symptoms tend to diminish dramatically over the first few months of pill use. Some women stop using pills because of these problems, but counseling users about expected menstrual changes can decrease the likelihood that they will stop using the pill. However, if a woman does not accept the pattern of bleeding associated with one type of pill, she may want to try another type.

Androgenic effects. Low-dose combined pills tend to have a beneficial effect on acne and oily skin, because they all suppress a woman's production of testosterone.^{14,18} The new progestins (desogestrel, norg-

estimate, and gestodene) appear to further reduce problems such as hirsutism, oily skin, sebaceous cysts, pilonidal cysts, and weight gain. These pills are associated with higher sex hormone binding globulin levels and lower free testosterone levels. In some cases, however, the progestin component of OCs produces both androgenic and progestational effects:⁹

- Increased appetite and weight gain
- Depression, fatigue, or tiredness
- Acne or oily skin
- Increased breast size (alveolar tissue)
- Increased LDL cholesterol levels
- Decreased HDL cholesterol levels
- Diabetogenic effect
- Pruritus (itching)
- Decreased tolerance of starches and sugars (carbohydrates)

Lipid changes. To produce the most beneficial lipid profile, prescribe one of the new progestin pills containing desogestrel, norgestimate, or gestodene. Generally, these new progestins increase HDL cholesterol and decrease LDL cholesterol. When prescribing one of the norethindrone pills, choose one with 0.4 or 0.5 mg of norethindrone.

Other Considerations in Pill Choice

Higher dose estrogens. A woman should not be started on pills with more than 50 mcg of estrogen. However, there are clinical situations when a 50 mcg pill may be helpful:

- Occasional spotting or the absence of withdrawal bleeding cannot be managed on a pill with less than 50 mcg.
- Acne, dysfunctional uterine bleeding, ovarian cysts, and endometriosis have all been treated occasionally with OCs containing 50 mcg of estrogen. Dysfunctional bleeding has been treated by prescribing a variety of OCs in the following regimen: one tablet four times a day for 5 to 7 days. Ovarian cysts less than 6 cm in diameter in women of childbearing-

age have been treated with combined monophasic pills (pills that contain the same dose of hormones throughout the active cycle of pills).

- Low-estrogen symptoms of menopause rarely occur in a woman taking a 20, 30, or 35 mcg pill and may be eliminated by a 50 mcg pill.
- Pregnancy, despite the perfect use of a 30 to 35 mcg pill, may signal that the user is a candidate for a 50 mcg pill. A second approach, which may be preferable, is to decrease the number of pill-free days from 7 to 4 or 5 (21 active pills followed by only 4, 5, or 6 days of no OCs before beginning a new package of pills).
- Rifampin and Dilantin (phenytoin) both accelerate the breakdown of estrogens in OCs, and women on these medications should probably be started on a 50 mcg pill.

New progestins. The new progestin pills may be ideal for women who are beginning to use contraceptives. The new progestins have several potential advantages over pills previously available:

- Higher HDL cholesterol and lower LDL cholesterol levels. However, while this biochemical profile might be expected to be beneficial to women over time, no clinical studies to date demonstrate clinical advantages.
- Lower free testosterone levels and higher sex hormone binding globulin (SHBG) levels. SHBG is increased more by desogestrel pills than by levonorgestrel pills.
- Reduced amenorrhea. There appear to be no women who go 2 months without a withdrawal bleed. Most women who take other low-dose OCs are amenorrheic for several cycles and feel uncertain or uncomfortable about this degree of menstrual irregularity.

The disadvantages of the new progestin pills are as follows:

- They may increase the confusion over the many pill options.
- Lowering of free testosterone may have negative effects although preliminary evidence has not shown this to be true.

- The price of some of the new progestins may be higher than the price of other pills.
- They present a greater risk of deep vein thrombosis.

Multinational studies have shown that soon after beginning pills with gestodene or desogestrel, women have a twofold to fourfold increase in nonfatal thromboembolic disease that is not affected by smoking, age, or history of hypertension.^{34,35}

Extensive in vivo and in vitro tests show norgestimate to have less androgenic effect than previously available progestins. In combination with EE norgestimate raises SHBG, reduces free testosterone, and elevates HDL cholesterol. It maintains a more favorable LDL:HDL ratio over a 2-year period than do the progestins levonorgestrel and norethindrone. Norgestimate does not adversely affect clinical coagulation profiles.

Desogestrel is the progestin most extensively used in pills prescribed in Europe, where a number of progestins have been competing for the pill market for over a decade. Its metabolic effects are similar to those described for norgestimate pills. Desogestrel is marketed as a monophasic pill in much of Africa and Europe as Marvelon and elsewhere as Desogen and OrthoCept.

Gestodene, used extensively in OCs in Europe, has many of the advantages of norgestimate and desogestrel.

Triphasic pills. Triphasic pills (pills that vary the dose of hormone taken in the early, middle, and end of the active cycle of pills) offer no particular advantages to clinicians. Indeed, they may complicate instructions for using pills. Of combined OCs containing levonorgestrel, the triphasics have the least amount of levonorgestrel.

Pill interactions. The lower the dose of estrogen or progestin provided to a woman as a contraceptive, the greater the chance that the effectiveness of a contraceptive pill is reduced.

- A second medication may induce liver enzymes that cause breakdown of an estrogen or progestin (microsomal liver enzyme induction). Rifampin has potent enzyme-inducing

effects; the antifungal drug griseofulvin may have similar but less powerful enzyme-inducing properties. The anticonvulsants most likely to have this effect are phenobarbital, phenytoin, carbamazepine, primidone, and ethosuximide (the anticonvulsant sodium valproate does not have this effect).⁵ Pregnancy may occur more often in low-dose OC users on anticonvulsants.^{4,8} Women receiving long-term phenobarbital therapy should begin with an OC containing 50 mcg of EE; if they have breakthrough bleeding, the dose should be increased even more.⁴

- A second medication may increase plasma SHBG levels, thereby decreasing the amount of biologically active free steroid.
- A second medication may decrease the amount of hormone initially absorbed or reabsorbed following passage through the liver. Antibiotics may decrease OC effectiveness by decreasing enterohepatic recirculation, increasing fecal or urinary excretion of steroids, or increasing liver degradation. However, despite anecdotal case reports of pregnancy occurring among users on antibiotics, no firm pharmacokinetic evidence exists linking antibiotic use to altered steroid blood levels.⁵
- Side effects of medication may cause nausea, diarrhea, or drowsiness or may cause a woman to fail to take OCs. Missing low-dose OCs may be more deleterious than missing higher dose pills.
- Spotting or breakthrough bleeding may cause a patient to skip several pills or discontinue the method altogether, both of which could lead to unplanned pregnancy.

Using OCs may affect the pharmacokinetics of other drugs a woman is taking. For example, OCs decrease clearance of benzodiazepines such as diazepam, nitrazepam, chlorthalidone, and alprazolam, and lower doses of these medications may be indicated for women on pills.^{1,5} Use of OCs may increase the effects of anti-inflammatory corticosteroids by decreasing their clearance and increasing their half-life. Lower doses of steroids may be indicated in OC users.⁵

Clearance of bronchodilating drugs such as theophylline and aminophylline, as well as the closely related drug caffeine, may be reduced by 30% to 40% in pill users.⁵ Questions remain as to the effects of OCs on analgesics, antihypertensive agents, and cyclosporin.⁵

MANAGING OF PROBLEMS AND FOLLOW-UP (PROBLEMS FOLLOW IN ALPHABETICAL ORDER)

Acne or oily skin

Combined pills tend to decrease acne. The estrogen in combined OCs has a beneficial effect on acne, as does the lowering of the circulating level of free testosterone caused by all available pills. Only rarely does a woman's acne become worse using a combined pill. If this happens, try a pill with a different formulation.

Amenorrhea and very scanty bleeding

The cyclic buildup of the uterine lining is almost always less in women using pills than in women experiencing natural cycles. The amount of vaginal bleeding in the 7 pill-free days may be scant or absent. Women should be told in advance to anticipate a decrease in bleeding.

Determine whether the patient is pregnant. Check for uterine enlargement, softening of the cervix, and other signs of pregnancy. The most important differential diagnosis to consider in a pill user who has missed periods includes pregnancy (intrauterine or ectopic) and inadequate buildup of the endometrium due to low-dose pills.

Breakthrough bleeding and spotting between periods

Spotting and breakthrough bleeding are more likely to occur among women taking low-dose pills than among women using higher dose pills. However, even women using very low-dose pills have more regular cycles than women using no birth control pills. Inform clients that spotting is quite common in the first few months of taking pills, that it tends to improve over time, and that you may be able to change

her pill to a different formulation should spotting or breakthrough bleeding continue and be bothersome to her. *Chlamydia infection can cause spotting or breakthrough bleeding.* Consider chlamydia infection in the differential diagnoses if the woman has had a recent change in sexual partners.

Breastfeeding problems

Combined pills appear to decrease both the volume and protein content of breast milk in some breastfeeding women. Small amounts of the hormones in pills are present in the breast milk. Some studies have shown normal weight gain in infants whose mothers were using OCs while breastfeeding. The hormones that pass through breast milk do not appear to harm the breastfed infant, but breastfeeding women should use an alternative to combined OCs.^{14,26} Progestin-only contraceptives are a better choice than combined OCs. If a woman decides to use combined OCs postpartum, she should not use them until after she has established a good flow of breast milk.

Breast fullness or tenderness (mastalgia)

Lowering the amount of estrogen provided in each pill tends to reduce breast tenderness. The differential diagnosis of breast fullness or tenderness includes actual growth of breast tissue; cyclic edema due to either the estrogen or the progestin; early pregnancy; and tenderness from benign breast disease, a fibroadenoma, or breast cancer. After ruling out the possibility of pregnancy and breast cancer, switch the patient to the lowest estrogen pill available or to a progestin-only pill. Symptoms may improve if the woman avoids vigorous physical exercise (which shakes breast tissue) during times of most discomfort.

Chloasma

Pills may cause chloasma (mask of pregnancy), particularly if a woman is exposed to a lot of sunlight. Darkening of skin pigment usually occurs on the upper lip, under the eyes, and on the forehead. The increased pigmentation may be slow to fade when pills are discontin-

ued. Other skin conditions that may occur in pill users include telangiectasia, neurodermatitis, erythema multiforme, erythema nodosum, eczema, photosensitivity, and loss of hair.

Depression and other mood changes

If severe depression begins after a woman starts taking pills, strongly consider advising her to discontinue the pills to see whether the depression goes away. She should use a different method of contraception that both she and her partner find acceptable. If depression is related in part to fear of becoming infected with HIV, encourage condom use. Lowering of the estrogen or the progestin content (or both) may benefit depression associated with pill use. Because OCs can deplete the body of some vitamins, use of supplemental vitamins (especially containing Vitamin B) may help improve depression.

Eye problems such as blurred vision or loss of vision

Vision changes may accompany headaches and a transient decrease in blood flow (ischemia). If a patient has experienced transient, total, or partial loss of vision, strongly consider discontinuing pills immediately to see whether the symptoms go away. If visual symptoms accompany migraine headaches that have become worse, discontinue pills immediately.

Headaches

Headaches may be mild, severe, recurrent, or persistent. Women may note an increase or decrease in the severity of migraine headaches. Pill-induced headaches are sometimes associated with blurred vision, loss of vision, nausea, vomiting, or weakness in an extremity. Because severe headaches may be an early warning of a stroke, they need to be taken seriously. Pay particular attention if symptoms are increasing. Definitely consider discontinuing pills if headaches have become worse. If the woman's headaches are clearly related to beginning oral contraceptive use, discontinue or change to a pill with lower estrogen or lower progestogen. Re-evaluate the woman's headaches after 1 or 2 cycles.

Decreased sex drive or libido

Although some women note a decrease in sex drive, many others find they enjoy intercourse more because they no longer fear pregnancy. If a woman does note an unwanted change in her interest in sex when she starts on a combined pill, consider giving a different pill.

Nausea

Although less of a problem for women on lower dose pills, nausea is most likely to occur during the first cycle or so of pills or during the first few pills of each new package. Vomiting is rare. Many women can control nausea by taking their pills with a meal (the dinner or evening meal may be best). Taking pills at bedtime has helped some women. When nausea occurs for the first time after months or years of taking pills, look for signs of early pregnancy. Nausea may also be caused by flu or another acute infection rather than the pill. Consider changing to a combined pill with less estrogen or to a progestin-only pill containing no estrogen. Inform the patient that if she vomits within 1 hour of taking a pill, she should take an extra pill from a separate pack to replace the pill she took just before vomiting.

Pregnancy

Although pills are very effective, they can fail. Inform the patient that there is no apparent increased risk of birth defects if pills have been taken during pregnancy. Discontinue pills if a diagnosis of pregnancy is made. Refer the patient for prenatal care if she wishes to continue pregnancy or for a legal abortion if she wishes to terminate the pregnancy.

Weight change

Pill use may be associated with an increase or decrease in weight. Weight change is usually minimal and not related to pill use. History should include questions about change in appetite since starting pills, cyclicity of weight gain, and symptoms of early pregnancy. There is no evidence that overweight women require a higher dose pill for the OCs to be effective. Obese women should start on a low-dose com-

bined pill. The protective effect of pills against endometrial cancer may be particularly desirable in overweight women, whose risk of endometrial cancer is increased.

INSTRUCTIONS FOR USING COMBINED PILLS

Birth control pills do not protect you from HIV or other sexually transmitted infections. If there is any risk of sexually transmitted infection, use a condom (male or female) every time you have sexual intercourse.

No matter what other methods of contraception a woman is using, if she is at any risk because her partner tests HIV positive or because she does not know his HIV status, she should be advised to use plastic or latex condoms with every sexual act. No other contraceptive method besides abstinence provides the same degree of protection.

The pill is a very effective method of birth control. It works primarily by stopping ovulation (release of an egg). In addition to preventing pregnancy, pills decrease the risk of ovarian cancer, cancer of the lining of the uterus, benign breast masses, and ovarian cysts. Pills decrease menstrual blood loss, menstrual cramps, and the chance of having an ectopic pregnancy—a pregnancy outside the uterus.

1. Swallow a pill at the same time every day—pills work best if you keep a steady level of hormones in your system.
2. **Choose a back-up method of contraception** (such as condoms or foam) to use with your first pack of pills because the pills may not fully protect you from pregnancy during this first cycle. A back-up method is probably not necessary if you start taking pills on the first day of bleeding (see instruction #3 below). Whether or not you use a back-up contraceptive your first month on pills, keep a back-up method handy all the time and learn to use it correctly in case you do any of the following:

- Run out of pills
 - Forget to swallow your pill
 - Experience a pill warning signal and discontinue pill use
 - Want protection from sexually transmitted infections, most notably the virus which causes AIDS (Condoms provide the best protection.)
 - Have repeated episodes of breakthrough bleeding
3. You may start taking your pills according to one of several different schedules:
 - First day of menstrual bleeding
 - First Sunday after your period begins
 - Today if you are certain you are not pregnant
 4. Take one pill a day until you finish the pack. Then follow these directions:
 - If you are using a 28-day pack, begin a new pack immediately. Do not skip days between packages.
 - If you are using a 21-day pack, stop taking pills for 1 week and then start your new pack.
 5. Take your pill at the same time you do something else at about the same time every day, like going to bed, eating a meal, or brushing your teeth. A regular routine may make it easier to remember your pills.
 6. Check your pack of birth control pills each morning to make sure you took your pill the day before.
 7. If you have bleeding between periods, try to take your pills at the same time every day. If you have spotting (light bleeding between periods) for several cycles, you may want to call your clinician to see whether you need a different pill. Spotting is more likely to occur with the current low-dose birth control pills. Because spotting is generally not a sign of a serious problem in young women, your clinician may take a "watch-and-wait" approach if you are not concerned or inconvenienced. If you suddenly begin to have

bleeding between periods and you have not previously had this problem or have not missed pills or taken pills late, consider having your clinician check you for an infection. Spotting between periods may also signal decreased pill effectiveness. Some clinicians recommend a back-up contraceptive for women who have spotting when they use pills, especially if the woman is taking a medication that may lower pill effectiveness.

8. Some drugs decrease the effectiveness of birth control pills. Be sure to tell your clinician whether you are using any of these drugs: rifampin, Dilantin (phenytoin), carbamazepine, ampicillin, or tetracycline. Taking vitamin C may actually raise the level of estrogen in your blood and may lead to increased spotting.¹⁴
9. **If you forget to take your birth control pill or if you start your pack late, use your back-up method of birth control for 7 days, and follow the instructions below:**
 - If you miss 1 pill, take that pill as soon as you remember it. Take your next pill at the regular time.
 - If you miss 2 pills in a row, take 2 pills as soon as you remember and take 2 pills the next day. Then return to your regular schedule.

If you miss 3 pills in a row, ask yourself if pills are a good method of birth control for you. You might be better off choosing a different method.

- If you miss 3 pills in a row, you will probably begin your period. Whether or not you are menstruating, throw away the rest of your pack of pills and begin a new pill pack as you did when you first started using pills.

For example, if you are a "Sunday starter," begin your next pack on Sunday. If you started on any other day, simply start your next pack immediately.

- If the only pills you miss are from the **fourth week** of a 28 day pill pack, simply throw away the missed pills. Then continue

taking pills from your current package of pills on schedule. The pills in this fourth week do not contain hormones, so missing these pills does not increase your risk for pregnancy at all. You do not need to use your back-up method of birth control.

10. If you have diarrhea or vomiting, use your back-up method of birth control until your next period. Start using a back-up method on your first day of diarrhea or vomiting. Many women experience nausea the first month they take pills. This tends to go away in the next cycle or so. If nausea continues, switching to the lowest dose pill may help. Ask your clinician.
11. Women taking pills note that periods tend to be short and scanty, and you may see no fresh blood at all. **A drop of blood or a brown smudge on your tampon or on your underwear is considered a period when you are on the pill.**
12. If you do not have your menstrual period when expected while taking birth control pills, you may want to consult your clinician.
 - *If you have not missed any pills and you miss 1 period* without any other signs of pregnancy, it is unlikely you are pregnant. Many women who take birth control pills occasionally miss 1 period. Call the clinic if you are worried. You are fairly safe and can start a new package of pills at the regularly scheduled time.
 - *If you forget 1 or more pills and miss a period*, stop taking pills and use another method of birth control. Contact your clinic for a pelvic examination or a sensitive pregnancy test.
 - *If you miss 2 periods in a row*, come to the clinic for a pregnancy test immediately, even if you took your pills every day. Bring a sample of your first-morning urine in a clean container.
13. If you do become pregnant while taking birth control pills, you must decide whether you want to have a child at this time. The risk of having a baby with birth defects does not seem to be increased in pill users who become pregnant.
14. **If you decide you want to become pregnant**, stop taking pills. You may wish to use another method of birth control until you

have two or three normal menstrual periods off the pill so that when you become pregnant, your date of delivery will be accurate.

15. If you see a clinician for any reason or are hospitalized, be sure to mention that you are taking birth control pills.
16. **If you have problems with any mood changes**—depression, irritability, change in sex drive—see your clinician. Switching pill brands may help if your mood changes are related to the pill. Your clinician can help tell you what to do.
17. Learn the pill warning signals. Any one of these five symptoms may mean that you are in serious trouble. Note that the first letter of each symptom spells out the word "ACHES."

Early Pill Warning Signs

Caution

- A ■ Abdominal pain (severe)
 - C ■ Chest pain (severe), cough, or shortness of breath
 - H ■ Headache (severe), dizziness, weakness, or numbness
 - E ■ Eye problems (vision loss or blurring) or speech problems
 - S ■ Severe leg pain (calf or thigh)
-

Do not ignore these problems or wait to see whether they disappear. Contact your clinician immediately to tell him or her about your problem. Birth control pills are safer when you get help as soon as problems arise.

If you smoke, stop smoking. If you can't, it is all the more important that you watch for the pill warning signals. If you smoke you should probably stop taking pills at age 35.

THREE OF THE MOST COMMONLY ASKED QUESTIONS ABOUT PILLS

Do oral contraceptive pills cause cancer?

Studies have *not* shown that the pill causes cancer; in fact, the pill protects against cancer of the ovaries and lining of the uterus. Although the final word is still not in, we have learned more and more as we have gained experience with pills.⁷ By age 55, a woman is less likely to be diagnosed with cancer if she used OCs.

Good News

Pills make women less likely to develop three types of cancer:

- Ovarian cancer
- Endometrial cancer
- Choriocarcinoma (also called trophoblastic disease or molar pregnancies)

Pills also make women less likely to develop several benign tumors or masses:

- Benign breast masses (fibroadenomas and cysts)
- Fibroids (leiomyomata)
- Ovarian cysts

Bad News

There is one rare tumor of the liver that is more likely to develop in women using pills. However, this tumor is not a cancer.

Neither Harmful Nor Beneficial Effect

Pills probably have no effect on a woman's likelihood of developing a malignant melanoma; kidney, colon, or gall bladder cancer; or pituitary tumors.^{15,20}

Still Not Sure

- **Breast cancer.** By age 55, women who did not use pills are just as likely to be diagnosed with breast cancer as women who used pills.^{15,33} However, there is probably a definable group of young women who have used pills who are at increased risk for having breast cancer diagnosed before the age of 35.
- **Cervical cancer.** Some studies have shown an increased risk for cervical cancer among pill users, while others have not. Women taking pills should have a Pap smear regularly.
- **Cancer of the liver.** Some studies have shown an increased risk for liver cancer,^{10,17} while others have not.^{12,28,36}

Does the pill cause deformed babies and multiple births?

No. The number of babies born deformed or the number of multiple births is no different among women who have used pills and those who have not.³

When a woman stops using the pill, will she have difficulty getting pregnant again?

After a woman stops taking the pill, her ovaries begin to work just as they did before she took the pill. On average, it takes 2 to 3 months after stopping the pill to become fertile. The small number of women who have trouble getting pregnant after taking the pill would have had trouble even if they had never taken the pill.³

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Norplant, Depo-Provera and Progestin-Only Pills (Minipills)

"Ninety-five percent of our patients are using Depo-Provera" was the claim of a large Family Planning Association of Kenya (FPAK) clinic in northern Kenya in 1980. It took only a minute to discover why almost all the women obtaining contraceptives at this clinic were choosing birth control shots. Part of the answer was that there was no Depo-Provera at the surrounding Ministry of Health Clinics. The other reason for the tremendous popularity of Depo-Provera was the privacy it offered. Women could come to the FPAK clinic, obtain their shot every 3 months, and maintain their anonymity. No pills to take on a daily basis. No permit for a husband to sign before tubal ligation. No condoms or spermicides to wrestle with at the time of intercourse.

Any program offering Norplant, Depo-Provera, progestin-only pills, or a progestin-releasing intrauterine device (IUD) will be successful only if providers counsel women in advance about the menstrual changes that will occur when they use a progestin-only approach to contraception. Menstrual changes are the most common reason that women stop using these methods.

NORPLANT

When a woman decides to have Norplant implants inserted, this single decision may provide her with 5 years of effective birth control. At the time of insertion, it is important to assure the client that she can have the method reversed at any time by having the capsules removed.

DEPO-PROVERA

Depo-Provera, a form of depo-medroxyprogesterone acetate (DMPA) is the most commonly used injectable progestin. It is extremely effective in part because its protection continues even if a woman returns several days to 2 weeks late for an injection. DMPA has been used by more than 15 million women worldwide. It is approved for use in more than 90 countries.

MINIPILLS

Progestin-only pills are taken every day with no pill-free interval.

OVERCOMING BARRIERS

Injectable contraceptives have played an important role in Africa because of their availability and their long-term effectiveness and women's ability to use them discreetly. Norplant and progestin-only pills are not as widely used, largely because they are relatively unavailable. Education and counseling are the two greatest assets in overcoming barriers to the use of progestin-only contraception.

1. Bleeding irregularities are common among women who use progestin-only contraceptives. Women who are not aware of this side effect often discontinue use of the methods. Education and counseling allow women to realize that irregular bleeding is not harmful and does not indicate that the methods are not working.

2. Norplant implants are expensive initially. However, when distributed over the 5 years the implants remain in place, the cost per year is reasonable.
3. Norplant implants are sometimes implanted too deeply, making removal difficult and potentially hazardous. Proper training in both insertion and removal reduces this problem. Training in removal should cover several approaches, including the Emory method.²⁶
4. An advantage of Depo-Provera injections is that they allow a woman to use a contraceptive without telling anyone else. Clinicians should be sympathetic to women placed in the position of needing to keep private their contraceptive use.
5. Because minipills have low doses of progestin, it is important they be taken every day at the same time.

MECHANISM OF ACTION

Progestin-only contraceptives may be administered by mouth, injection, or implants. The effects of these delivery systems are summarized in Table 14:1.⁷ (Some IUDs also deliver progestin.) Progestin-only contraceptives may prevent pregnancy via several mechanisms:

- Inhibiting ovulation
- Thickening and decreasing the amount of cervical mucus (making it more difficult for sperm to penetrate)
- Creating a thin, atrophic endometrium
- Disrupting normal functioning of the corpus luteum (premature luteolysis)

NORPLANT

With this long-acting contraceptive, steroid levonorgestrel slowly diffuses through six slender, flexible capsules. Each of these match-sized capsules is 34 mm long and has a diameter of 2.4 mm. (See Figure 14.1.) Each capsule contains 36 mg of levonorgestrel, which is

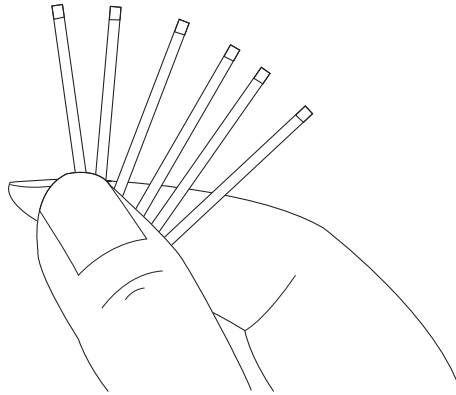
Table 14:1 Delivery systems for progestin-only contraceptives and combined oral contraceptives

	Progestin-Only			Combined OC
	DMPA	Norplant	Progestin-only pill	
Administration				
Frequency	Every 3 months	5 years	Daily	Daily
Progestin dose	High	Ultra-low	Ultra-low	Low
Blood levels	Initial peak then decline	Constant	Rapidly fluctuating	Rapidly fluctuating
First pass through liver	No	No	Yes	Yes
Major mechanisms of action				
Decreased ovulation	+++ Yes	++ Yes	+ Yes	+++ Yes
Decreased sperm penetrability	Yes	Yes	Yes	Yes
Decreased receptivity to blastocyst	0.3	0.04	0.5	0.1
First year failure rate				
Menstrual pattern	Very irregular	Very irregular	Often irregular	Regular
Amenorrhea during use	Very common	Common	Occasional	Rare
Reversibility				
Immediate termination possible	No	Yes	Yes	Yes
By woman herself at any time	No	No	Yes	Yes
Median time to conception (from first omitted dose or removal)	6 months	1 month	<3 months	3 months

Sources: Adapted from Guillebaud (1985).

released at a low, steady rate of about 85 mcg per day, decreasing to 50 mcg at 9 months, 35 mcg at 18 months, and 30 mcg thereafter. When the capsules are removed, the contraceptive effect wears off quickly.

Figure 14:1 The 6-capsule Norplant system



DEPO-PROVERA

A deep intramuscular injection of 150 mg of DMPA is given every 3 months. DMPA injections inhibit ovulation by suppressing follicle stimulating hormone (FSH) and luteinizing hormone (LH) levels and eliminating the surge of LH. DMPA probably acts on the hypothalamus.¹⁹ Each 150 mg injection actually provides more than 3 months of protection. A long-term user of DMPA has a 2-week "grace period" (longer in many instances) during which she can be late for her next shot but still not be at much risk of becoming pregnant.

MINIPILLS

In some women, minipills suppress ovulation. When this happens, the woman tends to be amenorrheic or have prolonged amenorrhea. If ovulation is not suppressed, these progestin-only pills have no effect on the cyclicity of bleeding, and menstrual bleeding occurs as it had before the woman started progestin-only pills. If ovulation does occur, the pills may still have a contraceptive effect because they cause thickening of the cervical mucus.

EFFECTIVENESS

NORPLANT

Norplant failures are rare. In the first year of use, 0.2% users experience a pregnancy.^{30,37} If women already pregnant when the device was implanted are removed from this calculation, the pregnancy rate falls to 0.09%. To avoid using this contraceptive in women who are already pregnant, clinicians should insert implants within 7 days of the onset of menstruation or, for women who have just delivered, either immediately postpartum or within 3 weeks after delivery.

Pregnancy rates for the second through fifth years are, respectively, 0.5%, 1.2%, 1.6%, and 0.4%. After 5 years, the total (cumulative) pregnancy rate is therefore only 3.7%.

Because pregnancies increase in the sixth year, women should have the capsules removed at the end of the fifth year. (Norplant is approved as a 5-year method.) If a woman wishes to continue using Norplant, she can have another set of implants inserted at the same time the first set is removed.

Women who weigh more than 70 kg may have higher pregnancy rates. However, most pregnancies in overweight Norplant users have been in women who were provided the hard capsule Norplant implants. Leiras Oy, the manufacturer, now produces implants only with the new soft tubing.¹⁸

Continuation rates for Norplant users are high; reported first-year continuation rates range from 85% to 95%.^{1,13,30} In five studies from around the world, 33% to 78% of users completed 5 years on Norplant.¹⁸

DEPO-PROVERA

Depo-Provera is an extremely effective contraceptive with a first-year probability of pregnancy of only 0.3%. This pregnancy rate applies to women receiving injections providing 150 mg of DMPA in 1 cc of solution.

Questions have been raised about the desirability of giving injections of 150 mg of DMPA every 3 months when DMPA can be given in much less expensive solutions that provide 400 mg of DMPA per 1 cc of this medication. (With this alternative, only 0.375 cc of solution is required to deliver 150 mg of DMPA.) However, it is very difficult to provide exactly 150 mg of DMPA in such a small amount of solution (0.37 cc), and this way of delivering DMPA is not approved as a contraceptive. Another approach would be to give 400 mg every 6 months in 1 ml of the 400 mg/ml formulation, but an unpublished Upjohn-sponsored trial of this alternative found that pregnancies occurred throughout the 6-month treatment period, not just at the end.² The concentrated form of DMPA is also more painful. Pain has been overcome by diluting the very concentrated form of DMPA with an equal volume of 1% xylocaine.

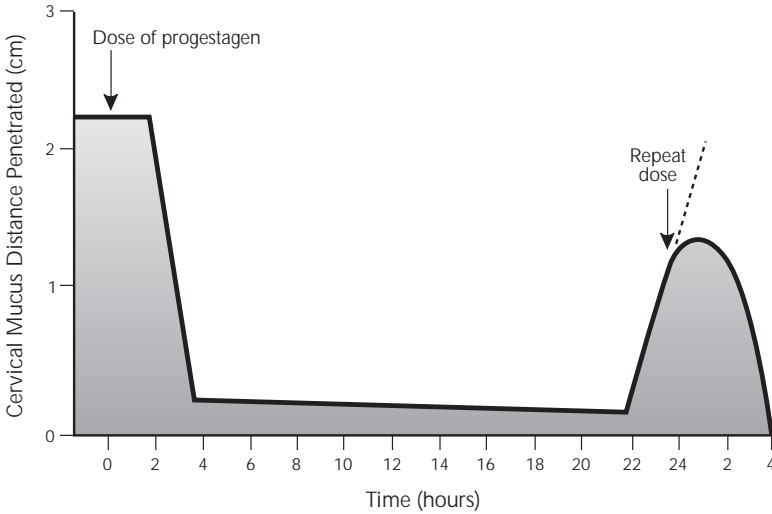
In the largest study of U.S. women, continuation rates for women on DMPA were 59.4%, 41.5%, 30.2%, 24.1% at 1, 2, 3, and 4 years, respectively.²⁷

MINIPILL

Progestin-only pills are generally less effective than combined oral contraceptives (OCs). The proportion of women becoming pregnant in the first year of typical use ranges from 1.1% to 13.2%. If minipills were used correctly and consistently; however, only 5 in 1,000 (0.5%) women would become pregnant in the first year.

The effectiveness of progestin-only pills is highest when ovulation is consistently inhibited. When this happens, a woman tends to be amenorrheic or to have prolonged periods of time between menstrual bleeding episodes. *The effectiveness of progestin-only pills is greatest when the "normal" bleeding pattern is most disturbed.* It is particularly important that progestin-only pills not be taken even a few hours late, because they will then lose effectiveness. Figure 14:2 illustrates how the sperm penetration of cervical mucus increases if the time interval between progestin-only pills is more than 24 hours. In breastfeeding women, the progestin-only pill is nearly 100% effective.⁷

Figure 14:2 Sperm penetration test following progestin-only pill



Note: Minimum reduction in sperm penetration between 4 hours and 22 hours after a single dose of megestrol acetate (0.5 mg). Unlike the rest of the figure, the effect of a repeat dose is presumed, not experimental.

Source: Guillebaud (1985).

ADVANTAGES AND INDICATIONS

ADVANTAGES

The following advantages hold for all progestin-only contraceptives.

1. **No estrogen.** Because progestin-only contraceptives contain no estrogen, they do not cause the serious complications associated with estrogen, which include thrombophlebitis and pulmonary embolism. Studies thus far have not shown any serious short-term or long-term effects of DMPA.^{5,6,20,28}
2. **Noncontraceptive benefits.** Norplant, Depo-Provera, and progestin-only pills offer several noncontraceptive benefits:
 - Scanty menses or no menses
 - Decreased anemia
 - Decreased menstrual cramps and pain

- Suppression of pain associated with ovulation (mittelschmerz)
 - Decreased risk of developing endometrial cancer, ovarian cancer, and pelvic inflammatory disease (PID)
 - Management of pain associated with endometriosis
3. **Reversibility.** Norplant and minipills are immediately reversible. A woman must use alternative forms of contraception as soon as Norplant implants are removed or minipills are stopped. Depo-Provera is reversible, but return of fertility is not as rapid as with Norplant or progestin-only pills.²³ There is a delay in return of fertility of an average of 6 months to 1 year after ceasing use of Depo-Provera.³⁴ No surgical procedure is necessary to discontinue use of Depo-Provera or progestin-only pills.
 4. **Long-term effective contraception.** Norplant implants and long-acting injections are extremely effective long-term contraceptives. In the case of Norplant (and the levonorgestrel IUD), a single decision leads to long-term contraception. The effectiveness of implants and injections does not depend on the woman's taking day-to-day responsibility for her contraception. DMPA provides excellent short-term contraception for women who require protection following rubella immunization, are awaiting sterilization, or are partners of men undergoing vasectomy. Women appearing late for their injection of DMPA have a grace period during which they will not become pregnant. The package insert defines this period as 2 weeks; others suggest that the grace period is 4 weeks.
 5. **Low risk of ectopic pregnancy.** Norplant and DMPA reduce a woman's risk of having an ectopic pregnancy compared to women using no contraceptive at all. Women using Norplant have an ectopic pregnancy rate of 1.3 per 1,000 woman—versus the 6.5 per 1,000 women-years for women using no contraceptive. Ectopic pregnancy may be more common in heavier women or may increase with longer use of Norplant.¹⁸ Ectopic pregnancy is very unlikely to occur in women receiving DMPA injections. Progestin-only pills are less protective against ectopic pregnancies than are combined pills, Norplant, or DMPA.

6. **Amenorrhea.** Progestin-only contraceptives cause amenorrhea in some women, but some users may consider the absence of bleeding an advantage. During the first year of DMPA use, 30% to 50% of women are amenorrheic; by the end of the second year, 70% are amenorrheic, and by the end of the fifth year, 80% are.²⁰ In contrast, amenorrhea occurs less frequently in women using Norplant.

NORPLANT

7. **Continuation rates.** Norplant has higher continuation rates than do other hormonal contraceptives. The percentage of women continuing to use Norplant at 1 year is 85%. The continuation rate is about 15% less for women using pills or Depo-Provera.
8. **Not coitus dependent.** Norplant (and to a lesser extent, long-acting injections) is an excellent contraceptive option for women who have difficulty remembering to take pills or in using methods requiring interruption of intercourse. For example, Norplant may be a good option for a woman who abuses drugs or will have difficulty taking pills but who definitely wants to avoid pregnancy.

DEPO-PROVERA

9. **Culturally acceptable.** In some cultures, women consider receiving medications by injection to be desirable. For some women, it is a desirable option to be able to use a contraceptive without the knowledge of her partner, husband, or family.
10. **No drug interaction.** Thus far, there has been no demonstrated interaction between Depo-Provera and antibiotics or enzyme-inducing drugs.³⁴ DMPA effectiveness does not depend on a normally functioning gut.
11. **Fewer seizures.** DMPA has been found to decrease the frequency of seizures among women of childbearing age.¹⁵

MINIPILLS

12. **Ease of use.** Because using the minipill means taking the same type of pill every single day (same color and hormone content), some women may find it easier to use this kind of pill than other OCs.
13. **Emergency contraception.** An emergency dosing of minipills—0.75 mg progestin taken within 48 hours of unprotected intercourse and another dose of 0.75 mg taken 12 hours later—can reduce the risk of unintentional pregnancy. A pill called Postinor, available in Europe and Asia, delivers each 0.75 dose in one pill. All other minipills, which contain far less progestin, require that 20 pills be taken to equal the 0.75 mg dose. One dose of 20 minipills is taken within 48 hours after intercourse and a second dose of 20 pills is taken 12 hours after the first dose. (See Chapter 13 on Combined Oral Contraceptives for more discussion on “Emergency Contraceptive Pills.”)

INDICATIONS

Breastfeeding Women

Norplant, Depo-Provera, and minipills do not harm lactation, and some studies suggest that milk volume may increase.^{12,16} Although progestins can pass through breast milk, the dose ingested by the infant is small. Opinions vary about whether Norplant and Depo-Provera should be provided immediately postpartum. A cautious approach is to wait until breastfeeding has been well established. (See Chapter 12 on Lactation and Postpartum Contraception.)

Norplant. If a breastfeeding woman is unlikely to return for a postpartum visit and requests Norplant before leaving the hospital after delivery, the real long-term contraceptive benefit of using this method seems likely to exceed its theoretical risks, especially if the woman plans to supplement the infant's diet relatively soon after birth.

Depo-Provera. Studies of Depo-Provera started 2 to 4 days postpartum or at 7 days postpartum,¹⁶ and within 6 weeks postpartum¹² have all found no negative effects. Because the contraceptive benefit to the lactating woman in obtaining Depo-Provera immediately postpartum is smaller and the theoretical risks might be higher (hormonal levels are relatively high in the immediate post-injection days) than those for Norplant, it would be less advisable to inject Depo-Provera than to insert a Norplant before breastfeeding is well established.

Minipills. Studies of minipills have demonstrated no adverse effects on lactation or infant growth, even when they are started in the first week postpartum.^{17,21}

Older Women

Safety and low pregnancy rates make Norplant, Depo-Provera (and other long-acting injections), and progestin-only pills good options for older women. A woman may have Norplant inserted when she is fairly certain she wants no more children. Then, after 3 to 4 years, when she is absolutely certain she wants no more children, she may choose to have a tubal ligation or her husband may decide to have a vasectomy, followed by Norplant removal. For a woman who will be deciding about sterilization in the next 3 to 12 months, DMPA may be a better option than Norplant. Progestin-only pills are also an excellent option for women who are in their late reproductive years; they are more effective for older women.³ The absence of complications from thrombosis makes Depo-Provera, Norplant, and progestin-only pills advantageous for older women and for women planning to have an operation that might increase their risk for thrombophlebitis.

Young Women

For younger women, Norplant is desirable because of its extremely low pregnancy rate and its ready reversibility. The thick cervical mucus produced by implants also protects against PID. Depo-Provera is less readily reversible, but it has a very low pregnancy rate and probably protects against PID.

Women Who Cannot Take Estrogen

Progestin-only pills, as well as the other progestin-only methods, are particularly desirable for women who want to use an OC but have reasons to avoid combined pills. Women who have developed severe headaches or hypertension may be candidates for progestin-only pills.

DISADVANTAGES AND PRECAUTIONS

The progestin-only methods have few serious disadvantages. The precautions for prescribing are listed in Table 14:2.

1. **Menstrual cycle disturbance.** One of the most common reasons women stop using progestin-only contraceptives is that these methods change the menstrual cycle. Many women experience an increased number of days of light bleeding. Some women experience amenorrhea, which is most likely to occur in the first year of Norplant use. *While missed menstrual periods become less common over time among women using Norplant, amenorrhea becomes more common over time in Depo-Provera users.* Occasionally, women using Norplant or DMPA experience an increased number of days of heavy bleeding. Bleeding changes are usually *not* associated with increased blood loss in users of progestin-only contraceptives. Counsel women to expect changes in their cycles.
2. **Weight gain.** Some women using progestin-only methods gain weight or complain of feeling bloated. The weight gain is probably due to increased appetite stimulated by progestin rather than fluid retention.³⁴ Over 5 years, weight gain in Norplant users averages just under 5 pounds. Weight gain is less of a problem in women on progestin-only pills than in women on combined OCs.
3. **Breast tenderness.** Breast tenderness, which is occasionally very painful, has been noted in some women using Norplant and Depo-Provera. Always rule out pregnancy as the cause.
4. **Interaction with anticonvulsants.** Anticonvulsants (except valproic acid) increase Norplant pregnancy rates and, probably, pregnancy rates for progestin-only pills.

5. **Bone density decrease.** Decreased bone density has been reported in a retrospective study of 30 Depo-Provera users.⁴ One confounding effect in the study was that the DMPA users (40%) were more likely to smoke than were the premenopausal control women (10%). Although this one study does not mean that women should avoid long-term use of DMPA, the results suggest that osteoporosis and other effects of low estrogen need to be carefully considered.
6. **Lack of protection against sexually transmitted infections (STIs), including HIV.** No matter what other methods of contraception a woman is using, if she is at any risk because her partner is HIV positive or because she does not know her partner's HIV status, she should be advised to use condoms with every sexual act. No other contraceptive method besides abstinence provides the same degree of protection.

Norplant

7. **Difficulty in removing Norplant.** Both insertion and removal require a minor surgical procedure. Removal is particularly likely to be difficult if the implant was inserted too deeply. Norplant removal requires a clinic visit and, occasionally, more than one visit.
8. **Expense.** The initial cost of Norplant can be high, and if the implants are removed soon after insertion, this method is extremely expensive per month of contraception provided. Encourage long-term use by doing the following:
 - Explaining, in advance, the menstrual cycle changes that are likely to occur
 - Avoiding Norplant insertion for the woman who may change her mind quickly and want to become pregnant in the near future
 - Avoiding insertions for women who are already pregnant

Table 14:2 Precautions in the provision of progestin-only contraceptives (POCs)

Condition	Category			Rationale/Comments
	Mini pill	DMPA	Nor-plant	
Pregnancy	4	4	4	As no method is indicated, any health risk is considered unacceptable. However, the evidence on the possible harm to mother and fetus is incomplete.
Breastfeeding				
<6 wks postpartum	3	3	3	Concern that immature neonate may be at risk for exposure to steroid hormones.
>6 wks to 6 mths postpartum (primarily breastfeeding)	1	1	1	No concern regarding use of POCs in breastfeeding mothers after 6 weeks postpartum.
>6 mths postpartum	1	1	1	
Age				
Menarche—age 16	2	2	2	For women under 16 years of age, concerns regarding hypoestrogenic effect due to POC use.
>Age 40	1	1	1	
Smoking	1	1	1	No concern regarding risk of thrombosis with POC use.
Essential hypertension				
Mild hypertension (<180/105)	1	2	1	Concern regarding reduced high density lipoproteins in women using DMPA and Norplant with underlying vascular disease or moderate and severe hypertension.
Moderate and severe hypertension	1	2	1	
Vascular disease	2	3	2	
History of preeclampsia	1	1	1	Absence of underlying vascular disease suggests no need for restriction of POC use.
Diabetes				
History of gestational disease	1	1	1	
Non-vascular disease:				
non-insulin dependent	2	2	2	POC may influence carbohydrate metabolism, but does not present an additional risk of thrombosis.
insulin dependent	2	2	2	

1 = used in any circumstances

2 = generally used

3 = usually not used unless other more appropriate methods are not available or acceptable

4 = not to be used

Table 14:2 Precautions in the provision of progestin-only contraceptives (POCs) (Continued)

Condition	Category			Rationale/Comments
	Mini pill	DMPA	Nor-plant	
Nephropathy/retinopathy	2	3	2	Concern about possible negative effect of DMPA on lipid metabolism, possibly affecting the progression of nephropathy, retinopathy, or other vascular disease.
Other vascular disease or diabetes of >20 years' duration	2	3	2	
Venous thromboembolism				
Current and history	1	1	1	
Major surgery				
with prolonged immobilization	1	1	1	No concern regarding risk of thrombosis in POC users.
without prolonged immobilization	1	1	1	
Minor surgery without immobilization	1	1	1	
Varicose veins	1	1	1	
Superficial thrombophlebitis	1	1	1	
Current and history of ischemic heart disease	2	3	3	Concern regarding hypoestrogenic effect and reduced high density lipoproteins (HDL).
Stroke				
Current (in hospital)	3	3	3	Concern regarding reduced HDL among POC users.
History	2	3	2	
Familial hyperlipidemia	1	2	1	Although these conditions are a risk factor for vascular disease, routine screening is not needed and is inappropriate because of rarity of the condition and cost of screening.

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Table 14:2 Precautions in the provision of progestin-only contraceptives (POCs) (Continued)

Condition	Category			Rationale/Comments
	Mini pill	DMPA	Nor-plant	
Valvular heart disease				
Uncomplicated	1	1	1	No concern regarding risk of thrombosis in POC users.
Complicated (pulmonary hypertension, risk of arterial fibrillation, history of subacute bacterial endocarditis)	1	1	1	
On anticoagulant drugs	2	2	2	POC use may be associated with prolonged bleeding in the first three months. It is unknown if anticoagulants aggravate the bleeding.
Headaches				
Mild	1	1	1	No concern regarding risk of thrombosis in POC users.
Severe:				
recurrent, including migraine, <i>without</i> focal neurologic symptoms	1	2	2	Theoretical concern that severe headaches may increase in frequency; DMPA and Norplant cannot be discontinued immediately or effects persist for sometime after discontinuation.
recurrent, including migraine, <i>with</i> focal neurologic symptoms	2	2	2	
Irregular menstrual patterns (cyclic pattern maintained)				
<i>Without</i> heavy bleeding	2	2	2	Changes in menstrual bleeding patterns are common among healthy women.
<i>With</i> heavy bleeding	2	2	2	POC use may induce irregular bleeding pattern.
Unexplained vaginal bleeding (cyclic pattern disrupted)	3	4	4	Evaluation of these conditions is necessary before initiating POC.

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Table 14:2 Precautions in the provision of progestin-only contraceptives (POCs) (Continued)

Condition	Category			Rationale/Comments
	Mini pill	DMPA	Nor-plant	
Breast disease				
Undiagnosed mass	2	2	2	
Benign breast disease	1	1	1	No concern related to POC use for women with benign breast disease or family history of breast disease.
Family history of cancer	1	1	1	
Cancer:				
current	3	4	4	Breast cancer is a hormonally sensitive tumor. Concerns may be less with POC than with combined pills.
past and no evidence of current disease	3	3	3	
Cervical intraepithelial neoplasia (CIN)	2	2	2	Little concern that POC enhances progression of CIN to invasive disease.
Cervical cancer (awaiting treatment)	2	2	2	Theoretical concern that use may affect prognosis of the existing disease.
Cervical ectropion/erosion	1	1	1	Not a risk factor, no need for restriction of POC use.
Endometrial, ovarian cancer	1	1	1	In general, treatment of these conditions renders a woman sterile. While awaiting treatment, women may use POC.
Pelvic inflammatory disease (PID)				
Past (assuming no current risk factors of STIs)				
with subsequent pregnancy after past PID	1	1	1	
without subsequent pregnancy, however, pregnancy is desired	1	1	1	
without subsequent pregnancy, and pregnancy is not desired	1	1	1	Not a concern, no need for restriction of POC use.

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Table 14:2 Precautions in the provision of progestin-only contraceptives (POCs) (Continued)

Condition	Category			Rationale/Comments
	Mini pill	DMPA	Nor-plant	
Pelvic inflammatory disease (PID) — <i>continued</i>				
Within the last 3 mths	1	1	1	
Purulent cervicitis	1	1	1	
Trachomatis or N. Gonorrhoea	1	1	1	
Vaginitis without purulent cervicitis	1	1	1	
Increased risk of STIs (e.g. multiple partners or partner who has multiple partners)	1	1	1	
STIs: current or within 3 months	1	1	1	Not a concern, no need for restriction of POC use.
HIV/AIDS				
HIV+	1	1	1	No confirmation of an association of POC use with these conditions, although a modest risk may be present.
High risk of HIV	1	1	1	
AIDS	1	1	1	
Biliary tract disease				
Symptomatic				
surgically treated	1	1	1	Not a concern, no need for restriction on POC use.
medically treated	1	1	1	
current	1	1	1	
Asymptomatic	1	1	1	
Sickle cell disease	1	1	1	
Epilepsy	1	1	1	The condition, <i>per se</i> , is not a concern. No need for restriction of POC use.
				Certain antiepileptic drugs lower POC efficacy. If a women is taking treatment, refer to section of drug interactions.

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Table 14:2 Precautions in the provision of progestin-only contraceptives (POCs) (Continued)

Condition	Category			Rationale/Comments
	Mini pill	DMPA	Nor-plant	
Schistosomiasis	1	1	1	Not a concern, no need for restriction of POC use.
Malaria	1	1	1	Not a concern, no need for restriction of POC use.
Drug interactions				
Commonly used drugs with affect liver enzymes: antibiotics (rifampicin and griseofulvin)	3	2	3	Commonly used liver enzymes inducers are likely to reduce the efficacy of POCs.
anticonvulsants (phenytoin, carbamazepine, barbiturates, primadone)	3	2	3	Use of other contraceptives should be encouraged for women who are on long-term use of any of these drugs.
Other antibiotics*	1	1	1	
Parity				
Nulliparous	1	1	1	Not a concern. No need for restriction of POC use.
Parous	1	1	1	
Rapid return to fertility desired	1	3	1	Some delay in return to fertility may occur with DMPA use (10 months median delay in conception after last DMPA injection). No risk for permanent infertility.
Severe dysmenorrhoea	1	1	1	Not a concern. No need for restriction of POC use.

*Excluding rifampicin + griseofulvin

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Norplant (continued)

9. **Extremely low-dose contraceptive.** Because of its low dose, Norplant's effectiveness is lowered more significantly by anti-seizure medicines (except for valproic acid) and by rifampin than are other hormonal contraceptives. Norplant pregnancy rates increase to unacceptable levels if a woman takes any of the following drugs:^{8,22}

carbamazepine	primidone
phenytoin (Dilantin)	phenylbutazone
phenobarbital	rifampin

All anti-seizure medications are strong inducers of the hepatic enzymes, which cause breakdown of levonorgestrel. If a Norplant user begins one of these medications, she should use a back-up contraceptive.

10. **Local inflammation or infection at the site of implants.** First-year users occasionally have infection, skin irritation, or expulsion of a capsule, but complications do not always occur immediately after insertion. One-third of infections and two-thirds of expulsions occur after the first 2 months of use.¹¹
11. **Ovarian cysts.** Most ovarian cysts regress spontaneously. Cysts do not need to be evaluated sonographically or laparoscopically unless they become large, painful, or fail to regress.³⁶

Depo-Provera

12. **No immediate discontinuation.** Weight gain, depression, breast tenderness, and menstrual irregularities may continue until the DMPA is cleared from a woman's body—about 6 to 8 months after her last injection. A woman becomes fertile again in an average of 6 months to 1 year after ceasing to use Depo-Provera.³⁴
13. **Return visits every 3 months.** Some women find the requirement of repeated injections unacceptable. However, most women continue to use DMPA after 1 year.

14. **Lipid changes.** High-density lipoprotein cholesterol levels fall significantly in women using DMPA.²⁰ Adverse changes in lipids do not occur in women using Norplant.

Minipills

15. **Vulnerable efficacy.** Progestin-only pills require absolute regularity in pill-taking and attention to timing.
16. **Less available.** These pills are less likely than OCs to be stocked by pharmacies, family planning clinics, and hospital formularies.
17. **Less clinician experience.** Clinicians are less likely to have had experience prescribing progestin-only pills and may be less comfortable in counseling patients about them.
18. **Ovarian cysts.** Minipill users experience an increased risk of functional ovarian cysts. See the discussion of ovarian cysts under the section on Norplant.
19. **Ectopic pregnancy.** Ectopic pregnancy is more likely among women who become pregnant as a result of minipill failure than among women who use other OCs.

PROVIDING NORPLANT

Although Norplant implants produce few side effects or complications, some women are not ideal candidates. Table 14:3 describes the precautions for providing Norplant implants. These precautions replace the outmoded concept of contraindications.

Although hormonal methods are not considered the method of choice for breastfeeding women. Norplant implants may still be appropriate for this group. (See the section on Indications in this chapter and the discussion in Chapter 12 on Lactation and Postpartum Contraception.)

Table 14:3 Percentage of women reporting regular bleeding patterns or amenorrhea while using Depo-Provera injections Norplant implants

	Depo-Provera		Norplant	
	1 year	5 years	1 year	5 years
Regular cycles*	30	17	27	67
Amenorrhea	25	80	5	9

*Regular cycle is 25 to 34 days for Depo-Provera users and 21 to 35 days for Norplant users.

Source: Shoup, et al. (1993)

NORPLANT INSERTION: 20 HELPFUL HINTS

Norplant insertion is a minor surgical procedure performed under local anesthesia. Using a simple trocar, the clinician places the implants under the skin on the inside of a woman's upper arm in a fan-shaped configuration. Norplant implants should be replaced after 5 years. A two-capsule Norplant system is being developed to simplify both insertion and removal.

1. Use an arm model to practice insertion. If this is the first, second, or third time you have inserted Norplant implants, take 3 to 5 minutes to insert a set of implants into the arm model. Practicing on the model will remind you what to do and what not to do.
2. Reassure your new client that insertion is not painful. Fear of pain at the time of insertion is the number one concern of women considering Norplant.
3. Raise the head of the examination table to make your patient more comfortable.
4. Use the width of 4 fingers if you are a man, or 5 fingers if you are a woman, to measure up from the crease of the elbow to the place where you will make your incision. Mark this site using a template and pen.

5. Use the template and pen every time you insert a set of Norplant implants. Make no exceptions. These marks will help you put your local anesthetic at the precise site your trocar will be placed. This precision will also make removals easier, because you will know where to look for the implants.
6. Add sodium bicarbonate to the local anesthetic to decrease stinging as the local anesthetic is injected into the insertion sites. Use 0.5 cc of sodium bicarbonate (NaHCO_3) for every 5 cc of 1% xylocaine (a 1:10 ratio). Xylocaine comes in a 30 cc bottle. With 3 cc of NaHCO_3 added, you will have enough local anesthetic for a number of Norplant insertions in a single session. Throw away any remaining anesthetic at the end of each insertion session, because the NaHCO_3 destabilizes the xylocaine over time. Mix up only as much of the 1:10 solution you will need in a day.
7. Inject the local anesthetic slowly so that the patient feels less discomfort. A slow injection is particularly helpful if you are injecting xylocaine with no sodium bicarbonate. By the time the injection has been made for the sixth implant, the local anesthesia will be almost ready for the incision to be made.
8. Save 1 cc of local anesthetic for the sixth implant insertion site. If the anesthetic runs out, the client may experience significant pain during insertion of the last implant.
9. Make the incision very small—about 2 to 3 mm. With a small incision, the scar will be smaller. It is possible to make the incision with the trocar itself with no increased risk of pain, tenderness, edema, ecchymosis, or extensive scarring. Making a small incision with a scalpel makes introducing the trocar easier.
10. Insert the implants superficially in the tissue—this is the most important goal of the entire insertion process. Implants inserted deeper in the tissue layers are more difficult to remove.
11. Do not move the inner plunger as you withdraw the outer part of the trocar. Do not push on the inner plunger with your thumb or retract the inner plunger. The plunger should remain fixed.

12. Allow the trocar to remain inside the incision (under the skin) between insertion of each individual implant.
13. Once you have inserted an implant, hold it in place while you advance the trocar to insert the next implant. By holding the implant in place, you will prevent the trocar from catching and misplacing an already inserted implant.
14. Locate the distal tips of all six implants following insertion. If one implant is 5 to 10 mm farther from the incision than the others, it is often possible to push that implant with your fingernail toward the incision before wrapping the arm. Doing so will simplify removal.
15. Gently clean the area with an alcohol swab before bandaging your client's arm.
16. Show the client the incision site before you put on the butterfly bandage or gauze. She will be reassured when she sees the very small incision.
17. Roll the gauze or bandage over a 4"x 4" folded pad. Do not wrap it too tightly. Suggest that your client leave the gauze wrapping on the arm for 3 to 5 days to avoid having people touch the area while it is still tender.
18. Warn your client that she may have a large bruise when her bandage is removed. Tell her that the bruise will change colors before going away completely.
19. After insertion, inform the client whether an implant has been inserted too deeply or too far, or whether the proximal end of one implant was pulled distally.
20. After insertion, provide your phone number to your client and encourage her to call if she has questions or problems. Remind her that Norplant will cause a change in her menstrual cycle and that she should call if her new pattern of bleeding is bothersome. Remind her that medications can improve a bothersome pattern of bleeding.

NORPLANT REMOVAL: 20 HELPFUL HINTS

1. Use the arm model to practice removal. Wyeth Laboratories provides a plastic sheathing into which the implants are placed. The clinician may practice cutting the plastic sheath to remove implants.
2. If possible, perform your first Norplant removal with someone at your side who has experience removing Norplant implants. **Schedule adequate time.** Your first few removals may take 45 to 60 minutes. As you gain experience, the time of removal decreases to 20 to 30 minutes.
3. Try the Emory method of Norplant removal to ease the procedure. Some clinicians average less than 15 minutes per removal by using the following three techniques:²⁶
 - Using 6 to 8 cc of local anesthesia rather than 3 cc
 - Making an 8 to 10 mm incision rather than a 4 mm incision
 - Vigorously disrupting adhesions for 30 seconds by repeatedly opening a small curved hemostat in the tissue near the end of the implants before attempting removal of implants²⁷
4. Remind the client that removal may be more difficult than insertion. Inform her that removal may take 30 or more minutes and could require a second visit.
5. Raise the head of the exam table to make the patient more comfortable.
6. Be sure you are comfortable as you begin the removal. You may be more at ease sitting rather than standing and leaning over the patient's arm.
7. Identify both the proximal and distal end of each of the six implants. Mark the ends with a pen.
8. Add sodium bicarbonate to the local anesthetic to decrease stinging. This procedure is described in suggestion #6 in the previous section on Norplant insertion.
9. Inject the local anesthetic slowly under the proximal one-third of the implants. Wyeth instructions recommend that you initially

inject about 3 cc of 1% xylocaine. Have another 3 to 5 cc of xylocaine available to provide additional anesthesia in case you need it later. An alternative approach is to inject 8 to 10 cc of local anesthesia to permit a longer incision (1 cm) and more vigorous breaking up of adhesions with a small curved hemostat.²⁶

10. Rather than making your incision at exactly the same site as the location of the incision used to insert implants, make the incision 3 to 5 mm above the original incision site. Doing this makes the removal incision closer to the proximal tips of the six implants.
11. Make the incision for removal a bit longer (5 to 10 mm) than the incision used for insertion.
12. Make a second incision if one implant is far from the other implants.
13. Throughout the procedure, ask the client whether she feels any pain. Provide additional local anesthetic if needed.
14. Have an assistant help during the removal procedure.
15. With your finger, apply pressure to the distal end of each implant as you remove it. Push the implant toward the incision.
16. With a sharp blade or a gauze pad, remove the scar tissue covering the implants.
17. Do not pull an implant too hard; it may break.
18. Warn your client that she may develop a bruise after removal, but tell her it will go away completely.
19. Advise your client that taking a prostaglandin inhibitor may be helpful if she has pain in her arm after implant removal.
20. Remind your client that she may become pregnant immediately following Norplant removal. If she does not want to become pregnant, discuss contraception.

MANAGING NORPLANT PROBLEMS AND FOLLOW-UP

A number of side effects may occur in women using Norplant implants. Table 14:4 lists the side effects that were more common in women using Norplant than in women using an IUD.¹⁸

Various treatments can improve these symptoms. Occasionally, the implants must be removed to eliminate these complications. The physiological basis of many Norplant side effects needs clarification and it is an important research priority.

Menstrual disturbances. Changes in the pattern of menstrual bleeding are a common reason for removing Norplant implants, but counseling can minimize decisions to remove implants because of this side effect. Inform women in advance to expect a change in the pattern of bleeding; more than 80% of women will notice a change.^{16,29} The three most common new patterns are an increased number of days of very light bleeding, amenorrhea, and increased days of heavy bleeding. The third pattern is not common. Inform women that several medications can help with these bothersome patterns of bleeding. It is very reassuring for women to know about these symptoms and that something can be done about them before the first sign of a bleeding problem appears. Clinicians may find several therapeutic approaches helpful:

- Several cycles of a low-dose combined OC
- Use of prostaglandin inhibitors
- Exogenous estrogens such as oral 17 β estradiol (Estrace), ethinyl estradiol (Estinyl), or conjugated estrogens (Premarin)

Be sure to inform women that the irregular pattern of bleeding may return when treatment is stopped.

Headaches. Headaches may be associated with pregnancy and with use of OCs and Norplant implants. If severe headaches associated with blurred vision and papilledema develop as a new symptom following Norplant insertion, removal of implants may need to be done

quickly. In December 1992, Wyeth Laboratories sent a letter to physicians describing severe headaches, papilledema, and a pseudotumor cerebri-like syndrome in 14 women using Norplant implants. Whether Norplant is causally related to these symptoms is not yet clear. If a client's headaches can be explained by causes other than Norplant and if headache symptoms are not severe, it may not be necessary to perform a fundoscopic exam.

Breast tenderness. This side effect may occur in some women. Recommended treatments include Vitamin E (600 units/day), tamoxifen (20 mg/day), and danazol (200 mg/day).

Weight gain. Although weight gain is usually due to other causes, weight gain may accompany Norplant use. Occasionally, women decide to discontinue the Norplant because of weight gain.

Hair loss. Hair loss has been noted in a few women, occasionally necessitating Norplant removal.

Acne. Acne has been a problem for some women on Norplant. Usually it is possible to manage acne without removing the implants.

Table 14:4 Common side effects in Norplant users

Side effect	Norplant users
Headaches	16.7-18.5
Breast tenderness	6.2-6.8
Nervousness	6.2-6.8
Dizziness	5.6-8.1
Nausea	5.1-7.7
Acne	4.5-7.2
Dermatitis	3.8-8.2
Breast discharge	3.5-5.1
Change in appetite	3.5-6.2
Weight gain	3.3-6.2
Ovarian enlargement	3.1-11.6
Hair growth or loss	1.8-2.6

Suitability Test. "Should I prescribe a minipill containing levonorgestrel to a woman for several months to see if she is going to tolerate Norplant?" This question is asked repeatedly at Norplant training sessions. Several side effects that could potentially lead to Norplant removal might be anticipated if a woman underwent a suitability test by using a levonorgestrel progestin-only pill for 1 or 2 months before Norplant insertion. Possible indications for using a suitability test for Norplant include a past history of, or extreme patient concern about, the following problems:

- Acne
- Weight gain
- Severe headaches
- Depression
- Allergy to levonorgestrel

Unfortunately, changes in the menstrual cycle that a Norplant user might experience are unlikely to show up with a suitability test. Moreover, the delay in inserting Norplant because of the suitability test means that the woman would be using a less effective contraceptive for a while. Testing a woman with several injections of Depo-Provera would make no sense at all as the hormones and the fluctuations in hormone levels in the serum are completely different.

INSTRUCTIONS FOR USING NORPLANT IMPLANTS

If inserted in the first 7 days of a menstrual cycle, Norplant is effective immediately. No back-up method is necessary. If Norplant has been inserted more than 7 days after your period starts, use a back-up method contraceptive if you have intercourse during the first 24 hours after Norplant insertion.

You are using a very effective contraceptive. Your six implants release levonorgestrel, a hormone-like progesterone that your ovaries produce. Levonorgestrel is the same hormone millions of women take each month in different kinds of birth control pills. You are receiving very low amounts of levonorgestrel constantly. Your contraceptive is

very safe and remains effective for 5 years, at which point it should be removed. You may want to get a new set of implants at that time.

You may have your implants removed at any time. The procedure for Norplant removal takes a bit longer than insertion and may require two visits. The contraceptive effects of Norplant end as soon as the implants are removed. Here is some additional information that might help you:

1. Norplant is one of the most effective contraceptives available. Only about 1 in 1,000 women who use the method will become pregnant in the first year. This pregnancy rate is lower than for the pill or IUD. In the first 2 years of use, Norplant is about as effective as female sterilization. Women who weigh more than 70 kg (154 pounds) may have higher pregnancy rates than those who weigh less.
2. Norplant becomes effective within 24 hours of insertion.
3. If you have pain after insertion, return to see your clinician. You might need antibiotics for an infection. Try to avoid direct pressure on the insertion area for a few days. After the incision has healed, you may touch the skin over the implants. The soft, flexible implants cannot break inside your body, so you should not be concerned about putting pressure on the area.
4. **The Norplant implants may cause you to have irregular bleeding** or more days of bleeding. However, if you have an increased number of days of bleeding, the amount of blood you lose is rarely enough to produce anemia. In fact, you will probably tend to lose less menstrual blood than you did before starting Norplant. A follow-up visit is recommended if you experience heavy bleeding.
5. The hormone levels in Norplant are very low. They are so low that there is very little buildup of the lining of your uterus. This means that there is very little lining to shed and you will notice very light periods or no periods at all. Your bleeding may be irregular. Generally, the amount of blood

loss is less than before Norplant implants are inserted, and some women become concerned when they have no bleeding at all while using Norplant. There is no harm to your health if you do not get your period. If you want to make sure you are not pregnant, you may return to the clinic for a pregnancy test, but you will probably not be pregnant. In some women, menstrual bleeding becomes more regular after implants have been in place for 9 to 12 months.

6. Most women do not have major problems with Norplant. Common side effects noted by women using implants include headaches, nervousness, nausea, dizziness, rash, acne, changes in appetite, weight gain, breast tenderness, hirsutism, and hair loss. Although ovarian cysts sometimes occur in Norplant users, they usually disappear on their own. Surgery is considered if a cyst remains beyond 10 weeks. Several other problems noted by women using Norplant may possibly be caused by the implant: breast discharge, inflammation of the mouth of the womb (cervicitis), mood change, depression, general malaise, weight loss, hypertension, and itching.
7. If you may be at risk for infection of the virus that causes AIDS (the human immunodeficiency virus, or HIV) or any other sexually transmitted infection, continue to use condoms throughout the time you use implants.
8. If you are seen by a clinician for a medical problem, mention that you are using Norplant implants.
9. **Replace the Norplant implants at the end of 5 years;** effectiveness decreases after this time. A new set of implants can be inserted when the old set is removed.
10. Return to your clinician if you have any questions, and watch for the following signs of potential problems:

Norplant Warning Signs

Caution

- Severe lower abdominal pain (ectopic pregnancy is rare but can occur)
- Heavy vaginal bleeding
- Arm pain
- Pus or bleeding at the insertion site (these may be signs of infection)
- Expulsion of an implant
- Delayed menstrual periods after a long interval of regular periods
- Migraine headaches, repeated very painful headaches, or blurred vision

Avoid bumping the area where your Norplant implants were inserted, and keep this area dry for several days after insertion.

COMMONLY ASKED QUESTIONS ABOUT NORPLANT IMPLANTS

1. *In what situations might Norplant implants be a better choice than the injectable contraceptive Depo-Provera?*

Norplant might be a better option than Depo-Provera when a woman has the following concerns:

- Weight gain is a major concern.
- The woman would have difficulty returning every 3 months for an injection.
- She fears repeated shots.
- When the method is discontinued, the client will want to become pregnant right away. This consideration is particularly important for women in their late reproductive years who want contraception now but will want to become pregnant right away after discontinuing contraception.

- When she needs a very effective reversible contraceptive for a long period of time. Some women have situations that contraindicate pregnancy, such as use of Accutane for a year or more, long-term use of anticoagulants, or chemotherapy for cancer.
- When a decrease in high-density lipoprotein cholesterol would be unacceptable.

2. *Can anything be done for a woman who has persistent bleeding while using Norplant?*

The problem is usually an atrophic endometrium. Chronic spotting can be controlled temporarily by having the woman take OCs for a while, which would stimulate the endometrium for 3 weeks and then remove stimulation for 1 week. Cycle your patient for several months. The additional hormones should not be a problem for most women if you use low-dose OCs or a low dose of conjugated estrogens, either ethinyl estradiol or estradiol.

Explain to the woman experiencing this annoying side effect that repeating the use of these extra hormones would not be harmful, that the amount of blood loss is probably less than she would have with the persistent bleeding rather than more; that she can have sexual intercourse in spite of the spotting; and that you would be happy to do an hematocrit to reassure her she is not anemic. Keep in mind that she could have an unrelated problem such as a chlamydia infection, a fibroid, or a cervical infection.

PROVIDING DEPO-PROVERA (DMPA)

The World Health Organization makes the reassuring statement: "In summary, DMPA and NET-EN (norethindrone enanthate) appear to be acceptable methods of fertility regulation. Clinical evidence from more than 15 years of use as contraceptive agents shows no additional, and possibly fewer, adverse effects than are found with other hormonal methods of contraception. Studies thus far have not shown any serious short- or long-term effects of DMPA or NET-EN."³⁴ There are a few precautions to the use of Norplant implants. These are noted in Table 14:2.

Toxicologic studies of DMPA in beagle dogs showed an increase in mammary gland tumors, some of which became malignant.¹² These studies have raised concern about the possibility of breast cancer in women using DMPA. Several studies in the United States and elsewhere have found no effect in humans.^{13,33} In a New Zealand study, 891 women with newly diagnosed breast cancer were compared with 1,864 women selected at random.²⁴ Women were interviewed by telephone about their past use of contraceptives and any risk factors for breast cancer. The overall relative risk of breast cancer associated with any use of DMPA was 1.0 (in other words, no increased risk relative to non-users). In women aged 25 to 34 years, the relative risk was 2.0. The risk was greatest among women who used the drug for 6 years or longer. This study suggests that DMPA may accelerate the presentation of breast cancer in young women, perhaps by acting as a promoter in the late stages of carcinogenesis.²⁴ A World Health Organization collaborative study failed to demonstrate a significantly increased risk for either breast cancer or cervical cancer among women using DMPA.^{35,36}

DMPA is usually provided from vials containing 150 mg of DMPA in each 1 cc of solution. DMPA produced in the United States is labeled for a 3-year shelf-life. DMPA made in Belgium has a 5-year shelf-life. The U.S. Agency for International Development expected that the U.S. Food and Drug Administration (FDA) would approve a 3-year shelf-life labeling by the time it started purchasing DMPA.²⁵ Deep intramuscular injections may be made into the deltoid or the gluteus maximus muscles. Injections into the deltoid may be less embarrassing, but slightly more painful. The needle should be 2.5 to 4 cm in length and 21 to 23 gauge; both needle and syringe should be sterile.³⁴ The area of the injection should NOT be massaged because this may lower the effectiveness of DMPA. Injections usually are not painful.

Injections are scheduled every 3 months, and are performed by clinicians. In international circles, there has been some discussion of self-administering injections of DMPA. After a woman has received several injections, each 150 mg of DMPA has a contraceptive effect greater than 3 months, which means that the method is forgiving of

the woman who returns late for her injection. Some programs will provide injections of DMPA up to 4 weeks late; women are informed that pregnancies are rare but may occur. When a woman does appear late for her shot, stress the importance of returning on time for injections in the future. Try to find out why a woman is late for injections. Her reasons may include a fear of cancer, changes in the pattern of menstrual bleeding, other side effects, cost of injections, time lost coming to the clinic, or partner or family disapproval of the method. Deal with these barriers sympathetically and try to help your client to overcome them. Satisfaction with this method may increase if clients are told to anticipate menstrual irregularity during the first year and an increasing likelihood of amenorrhea in subsequent years.

MANAGING DEPO-PROVERA PROBLEMS AND FOLLOW-UP

At every 3-month follow-up visit, ask about weight gain and any problems or concerns a woman may have, the date of her last menstrual period, and her risk for HIV infection and other STIs. Measure her weight and blood pressure. Use a simple flow chart to document a history of depression, severe headaches, and breast tenderness. In one of the largest studies of DMPA (3,875 users), headaches were noted in 17.1% of users, nervousness in 10.8%, decreased libido in 5.4%, breast discomfort in 2.7%, and depression in 1.7%.²⁷ Weight gain was greater among clinic patients than among private patients who were provided DMPA.²⁷ If the client appears to have a normal annual examination and is not complaining of unacceptable weight gain or other unacceptable symptoms, she may continue DMPA injections as long as desired. At the annual visit, perform a full evaluation, which includes all that you do at the 3-month intervals plus a complete exam. You will have an opportunity to discuss a number of subjects.

MENSTRUAL CHANGES

Women need to be informed in advance of the changes that will occur in their menstrual cycles. Do not underestimate the effect of changes in bleeding; they are the major reason many women discontinue this method. Spotting or breakthrough bleeding may be managed most easily in a family planning clinic by offering women a cycle or so of OCs. Five days of pills could be enough, but it may need to be repeated. Inform women that the irregular bleeding may return. Amenorrhea will increase over time and is not harmful.

ALLERGIC REACTIONS

The U.S. Physicians' Desk Reference (PDR) notes that anaphylactic and anaphylactoid reactions may occur immediately following Depo-Provera injections. Fortunately, severe anaphylactic reactions to DMPA are rare. However, since DMPA is irretrievable once injected, ask the client to wait a half hour before leaving the clinic. You should have on hand emergency medications such as epinephrine, steroids, and diphenhydramine.

INSTRUCTIONS FOR USING DEPO-PROVERA

You have chosen a very effective method of birth control: an injection every 3 months of Depo-Provera. Birth control shots are used by more than 6 million women around the world, and Depo-Provera is the contraceptive most commonly used for these shots. If you wish to get pregnant, discontinue birth control shots several months before you plan to conceive. The following information may help you use Depo-Provera:

1. Use an additional contraceptive method for 2 weeks after your first injection. This is not necessary if the first shot is given during the first 5 days after the beginning of a normal menstrual period.

2. If you may be at risk for infection with the virus that causes AIDS (human immunodeficiency virus, or HIV) or any other sexually transmitted infection, continue to use condoms throughout the time you use Depo-Provera.
3. Return to the clinic every 3 months for another injection.
4. Depo-Provera tends to make a woman's periods less regular, and spotting between periods is fairly common. Some women stop having periods completely. If your pattern of bleeding concerns you, return to the clinic to get a blood test for anemia, to rule out the possibility of a pregnancy, or to rule out the possibility of infection.
5. Weight gain is common in users of Depo-Provera. You will have to pay close attention to avoiding excessive calories if you want to avoid this side effect.
6. See your clinician if you develop any problems.

Depo-Provera Warning Signals

Caution

- Weight gain
- Headaches
- Heavy bleeding
- Depression
- Frequent urination

Contact us if you develop any of the above problems.

COMMONLY ASKED QUESTIONS ABOUT DEPO-PROVERA

1. *In what situations might Depo-Provera injections be a better choice for a woman than Norplant implants?*

Depo-Provera might be more acceptable or a wiser choice than Norplant implants for the woman who

- Is very concerned about a minor surgical procedure
- Has a history of sickle cell disease or of seizures, both of which may actually be improved by DMPA¹⁴
- Is taking a medication that markedly increases production of liver enzymes, which speed up the breakdown of levonorgestrel (the hormone elaborated by Norplant implants); these drugs include phenobarbital, phenytoin (Dilantin), primidone, carbamazepine, and phenylbutazone
- Needs highly effective contraception for just a *few months* (For example, a tubal sterilization or vasectomy may be scheduled; she may be receiving rubella immunization; or she may be using a medication like Accutane (for acne), which is known to produce severe defects in babies if taken by a pregnant woman; or she may be taking anticoagulants or valproic acid.)
- Needs *only a year* of extremely effective contraception (For example, she may have recently had a molar pregnancy and must not become pregnant for 1 year)
- Has a preference for receiving medications by injection
- Wants to keep all information about contraceptive use from her partner (for example, an abusive husband who does not want her to use contraception)

2. *Can a woman who is breastfeeding her baby receive Depo-Provera injections?*

Yes, this is an excellent option for breastfeeding mothers. Postpartum bleeding may be somewhat less predictable if DMPA is given immediately postpartum.

3. *Why is a method that was considered "bad" 10 years ago by the U.S. FDA now a good method?*

It has always been a good method. By the time Depo-Provera was approved in the United States, it was already being used by 8 to 9 million women throughout the world, in over 90 countries that had approved Depo-Provera.

4. *What is the most important difference between Depo-Provera (DMPA) and norethindrone enanthate (NET-EN) injections?*

NET-EN injections are injections of norethindrone in an oily base given at 2 month intervals for the first 6 months of use, after which injections are every 2 to 3 months.⁹ DMPA is given every 3 months. Other countries also have injections containing both an estrogen and a progestin.

It is important that the woman using NET-EN every 3 months *not be late* for her injection. That 3-month interval should not be exceeded or pregnancy rates will increase. Depo-Provera is more forgiving of the woman who is late for her injection.

PROVIDING PROGESTIN-ONLY PILLS (Minipills)

Because few women use minipills, large-scale studies that document their benefits and side effects have not been conducted. In general, progestin-only pills have lower effectiveness, more breakthrough bleeding, and fewer noncontraceptive benefits than do combined OCs.

Most of the health benefits of progestin-only pills are probably similar to those of combined estrogen-progestin pills: decreased menstrual cramps or pain, less heavy bleeding, a shorter period, decreased premenstrual syndrome symptoms, and decreased breast tenderness. In theory, the thick, less penetrable cervical mucus in women taking progestin-only pills should decrease the risk of PID.

Progestin-only pills should theoretically be safer than combined pills. Progestin-only pills have not been shown to increase the risk of either cardiovascular complications or cancer and are less likely to cause headaches, blood pressure elevation, depression, and other side effects than are higher dose combined OCs.³² However, the FDA-required class labeling in the package insert for progestin-only pills does not suggest different contraindications for minipills than for combined pills. The authors propose that contraindications be replaced with the precautions noted in Table 14:2.

Progestin-only pills are not the best choice for women who are not organized enough to take a pill every single day.⁷ Missing one or two progestin-only pills is more likely to lead to a pregnancy than is missing one or two combined OCs.

MANAGING MINIPILL PROBLEMS AND FOLLOW-UP

The most important problems with progestin-only pills relate to the patterns of bleeding. Many problems can be managed much as they are for women using Norplant implants or Depo-Provera. If the woman has increased days of light or heavy bleeding, spotting, or amenorrhea, first rule out pregnancy. If she is not pregnant, counsel her, switch to a combined OC, use supplemental estrogen (in the form of conjugated estrogens, such as 17-B estradiol or ethinyl estradiol), or use prostaglandin inhibitors.

INSTRUCTIONS FOR USING MINIPILLS

1. Have on hand a back-up birth control method such as foam, spermicidal tablets or suppositories, condoms, or a diaphragm. You will need to use your back-up method:
 - While you are waiting to start progestin-only pills or minipills
 - During your first cycle on minipills

- If you miss a minipill, use a back-up method until you restart or until your next period

Progestin-only pills are very low dose contraceptives. Your margin of error is not great. Do not count on this method unless you will be able to take pills every single day. Try to take your minipills at the same time every day. Some women use a back-up method at all times to increase the effectiveness of this approach to birth control. (See the questions at the end of these instructions for more on back-up contraceptives while on minipills.)

2. Swallow 1 pill each day until you finish your pill pack. Then start your new pack the next day. Never miss a day. The evening meal may be the best time to take progestin-only pills.

3. If you miss 1 minipill, take it (yesterday's minipill) as soon as you remember. Also take today's minipill at the regular time even if that means taking 2 pills in 1 day. If you are more than 3 hours late taking a minipill, use your back-up birth control method for the next 48 hours (2 days).

4. If you miss 2 or more minipills in a row, there is an increased chance you could become pregnant. Immediately start using your back-up method. Restart your minipills right away and double up for 2 days. If your menstrual period does not begin within 4 to 6 weeks, see your clinician for an exam and a pregnancy test.

5. Keep track of your periods while you take minipills. If you have more than 45 days with no period, you may want to see your clinician for an exam and pregnancy test.

6. If you have spotting or bleeding between periods, keep taking your minipills on schedule. If your bleeding is very heavy or if you have cramps, pain, or fever, see your clinician. Your bleeding may be caused by infection. In most cases, bleeding is not serious and will often stop after a few days. Bleeding is especially likely if you have missed 1 or more minipills. Bleeding is common during the first few months a woman takes minipills.

7. If you become ill with vomiting, severe diarrhea, or both, use your back-up method of birth control along with your minipills until 48 hours (2 days) after your illness is over. Using your back-up method will give you extra protection in case your illness or the medication you take for that illness interferes with minipill effectiveness.
8. If you decide you want to become pregnant, plan to stop using minipills and change to another method of birth control, such as condoms, for 2 or 3 months. Once you are off minipills, your natural cycle should be reestablished. Your clinician will be able to determine your pregnancy due date more accurately if you have at least two natural menstrual periods before you become pregnant.
9. Stop minipills anytime you want, even in the middle of a pill pack. Remember, though, that protection from the minipill does not last after you stop. Begin using another method the very next day.
10. If you may be at risk for infection with the virus that causes AIDS (human immunodeficiency virus, or HIV) or any other sexually transmitted infection, continue to use condoms throughout the time you use minipills.
11. See your clinician regularly for routine checkups. Be sure to have a blood pressure check, Pap smear, breast exam, and pelvic exam.
12. See your clinician right away if you have severe lower abdominal pain while using minipills.

Progestin-Only Pills (Minipills) Warning Signals

Caution

- Abdominal pain—May be due to an ovarian cyst or an ectopic pregnancy.
(Don't stop pills but contact us right away)
 - Pill taken late—Even if only 3 hours late, use a back-up contraceptive for the next 2 days.
Be careful to take the minipill ON TIME.
-

COMMONLY ASKED QUESTIONS ABOUT MINIPILLS

1. *What effect do minipills have on ovulation?*

Women taking the progestin-only pills will have one of three patterns: (1) they may ovulate every month, and their periods tend to be quite regular, (2) they may never ovulate, in which case their periods tend to be very irregular and they may go months without any bleeding, and (3) they may ovulate some months and not others, in which case their periods are also irregular.

2. *During the first cycle of minipills, are back-up contraceptives essential?*

No, whether or not a woman ovulates the first month on minipills, the production of a thick cervical mucus starts immediately and continues as long as minipills are taken every day at about the same time.

3. *During the first cycle of minipills, are back-up contraceptives wise?*

Perhaps. Minipills may be forgotten or taken late during that first cycle. Mistakes are more common the first month on any method of birth control.

4. *Which women might benefit most by using a back-up contraceptive while on minipills?*

Women who might be encouraged to use a back-up contraceptive while taking minipills include those who are ?

- In the first cycle (just to make sure pills are remembered and tolerated well)
- Late in taking a minipill (they should use a back-up contraceptive until back on schedule)
- Very regular in their menstrual cycles (e.g., every 28 days)—this is presumptive evidence that women are ovulating and might make them lean toward using a back-up contraceptive
- At any risk for HIV infection or STIs—they should use condoms consistently

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Intrauterine Devices (IUD)

"Why do I choose the IUD?" the older mother said in response to a question asked by her women's group. "It is simple, really. I cannot travel so frequently to the clinic. And when I do get to the clinic, I sometimes must wait for a long time to be seen. When I took the pill, I sometimes heard that my contraceptive choice was "not in supply, please come back another day." The IUD is so easy to use. I have as many children as I want."

As contraceptive use increases in Africa, the intrauterine device (IUD) is becoming one of the most acceptable methods. However, its popularity varies widely throughout the continent. For example, it is the most popular method in Egypt, where 16% of married women of reproductive age currently using a contraceptive method have an IUD, and one of the principal methods in Botswana and Kenya. In other countries, such as Mali and Uganda, as contraceptive use of any kind is low, very few women use the IUD.^{26,35} Women with IUDs use them longer than most other reversible methods of contraception.¹⁹

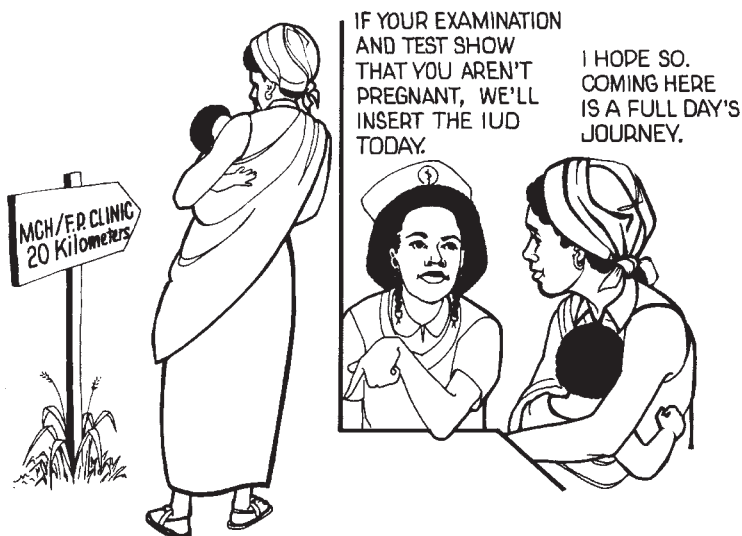
OVERCOMING BARRIERS

Some family planning programs have a policy that limits the time in the menstrual cycle when IUDs may be inserted—for example,

some programs allow IUD insertion only during menses. Although the purpose of such a policy is to make sure an IUD is not inserted into a pregnant woman, it is very inconvenient for clients and interferes with an effective IUD program. In some settings, women have to travel a long distance to reach a family planning clinic; rejecting their requests for an IUD because they are not having their periods would be unfair. In addition, return visits to the clinic cost money and thus create a barrier to services. As a rule, trust your client when she tells you she is not at risk of pregnancy, because she has not had intercourse since her last period or because she has used contraception. This basic trust contributes to thoughtful, dignified, and high-quality family planning services. (See Figure 15:1.) Several reasons support inserting the IUD at any time in the menstrual cycle:

- More options for convenient and flexible appointment times
- Lower infection rate and expulsion rate when the IUD is *not* inserted during days of menstrual bleeding
- At midcycle, the cervix is just as dilated as it is during menses and thus the IUD can be inserted easily at that time.³⁹

Figure 15:1 If you can determine that the woman is not pregnant, an IUD can be inserted even if she is not menstruating



A panel of experts at the Centers for Disease Control and Prevention has developed the following guidelines for informing women about IUDs:⁵

1. Most important, allow the client to choose her own method. She must be an informed user.
2. Make all presentations, counseling, and educational materials compatible with the language, culture, and education of the clients.
3. Set aside time for counseling as a routine part of the clinic visit. During the initial visit, a woman needs counseling to help her select a method, then additional counseling immediately after the IUD insertion to learn about checking IUD strings and watching for signs that suggest problems.
4. Be aware of the local myths and misconceptions about IUDs. Gaining this awareness may require background research. Address the misconceptions sensitively but directly.
5. Ask the client to repeat important information about the IUD to make sure she understands.
6. Give each IUD user an identification card with the name and picture of the IUD. The card may note the date of insertion and date of recommended removal.
7. If a client is not accustomed to following a calendar, inform her about the recommended dates for check-ups and IUD removal.
8. Sample IUDs should be available so that women can handle and examine them.
9. Provide flip charts, posters, and handouts describing key information about IUDs (and other available contraceptive methods).

MECHANISM OF ACTION

New evidence shows that the IUD's principal mechanism of action is to prevent fertilization of the egg. The copper IUD stimulates a variety of responses, including an increase of uterine and tubal fluids containing enzymes and white blood cells (macrophages) that consume, damage, or alter the transport of sperm and ovum so that fertilization does not occur. The Lng-20 IUD, which has primarily a hormonal mechanism of action, thickens cervical mucus, disrupts ovulatory patterns, alters the endometrium, and changes motility in the uterus and tubes.^{1,10,22,28,40}

EFFECTIVENESS

The effectiveness of modern IUDs compares favorably with other long-term contraceptive methods such as Norplant and sterilization. An IUD's effectiveness is influenced by its size, shape, and presence of copper or progesterone as well as by user characteristics such as age and parity. The pregnancy rate among IUD users also depends on such factors as ease of insertion, the clinician's experience in inserting IUDs, the patient's ability to detect IUD expulsion, and the patient's access to medical services. Pregnancy rates tend to be lower under the following conditions:

- The IUD is medicated with copper, silver, progesterone, or another progestin.
- The non-medicated IUD has a large surface area.
- The IUD has a low expulsion rate.
- Partial and complete expulsions are detected quickly.
- The IUD is inserted all the way to the top of the fundus of the uterus.

Copper T 380A. The Copper T 380A (Cu T 380A) has one of the lowest pregnancy rates of any contraceptive. The first-year pregnancy rate in typical users is 0.8%, whereas the lowest expected pregnancy rate (the rate for perfect use) is 0.6%.^{36,37} At the end of 7 years, the total (cumulative) pregnancy rate is 1.7%.²⁵

Levonorgestrel (LNg) IUD. Although expensive and not available in many countries, the Levonorgestrel IUD is the single most effective method of reversible contraception available in the world today, with the Cu T 380A running a close second. In the first 7 years, the total (cumulative) pregnancy rate is only 1.1%.²⁹

MultiLoad Cu 375 (ML Cu 375). The pregnancy rate for the MultiLoad Cu 375 is 1% after 12 months, 1.3% after 24 months, and 1.8% after 36 months of use.⁶

ADVANTAGES AND INDICATIONS

The IUD is a highly effective, safe, long-acting contraceptive method, and the client needs to make only a single decision to use it. In contrast, the pill requires daily decisions, and condoms and spermicides require decisions with each act of intercourse. Although perhaps more expensive initially than other contraceptives, the IUD is less costly over its years of use. It is also easier to use than other methods such as oral contraceptives, condoms, and spermicides. The IUDs that release progestin or progesterone decrease menstrual blood loss and menstrual pain (dysmenorrhea). The LNg-IUD reduces the incidence of pelvic inflammatory disease (PID)²⁷ and is an effective treatment for heavy menstrual bleeding (menorrhagia).³ In addition, IUDs can prevent and treat Asherman's syndrome (in which the walls of the uterus are adhered by synechiae), which can occur after uterine surgery.

Ideal candidates for the IUD include women who have medical precautions to hormonal methods, who want a long-acting and reversible method, who are in a mutually faithful relationship, or who are lactating or postpartum. Voluntary contraception and informed consent must always form the basis for contraceptive decision making.

The Copper T 380A has been used as an option for emergency contraception. When inserted *within 5 to 7 days* of unprotected intercourse, this IUD can significantly reduce the risk of pregnancy. Use of the IUD in this situation can lead to long-term use if the woman selects to keep the IUD. Only copper-bearing IUDs have been studied. The same precautions must be taken if the IUD is used as an emergency option.

DISADVANTAGES AND CAUTIONS

1. **Pelvic Inflammatory Disease.** One of the main concerns about using the IUD is the possibility of developing PID. Both use of the IUD and being at high risk for acquiring sexually transmitted infections (STIs) make women more likely to develop PID.¹⁴ Women increase their risk of acquiring STIs if they have more than one sexual partner or if their partner has other sexual partners. The greatest risk of pelvic infection associated with the use of the IUD occurs at its insertion.¹² (See Table 15:1.) This increased risk of infection may be associated with a microbiological contamination of the endometrial cavity at that time.¹⁹ To reduce the risk of PID, maintain strict asepsis at insertion and leave the IUD in place for its life span. The 1-year IUD (Progestasert System) is recommended only in unusual circumstances, such as allergies to copper. Compared with a copper-releasing IUD, the LNG IUD has been shown to provide a protective effect against PID.³³

Table 15:1 Intrauterine device use and pelvic inflammatory disease (PID)

Time after insertion	PID rate*	Relative risk
≤20 days	9.66	6.36
≥20 days	1.38	1.00

*per 1,000 woman-years

Source: Lee (1988)

2. **Human Immunodeficiency Virus (HIV).** Whether IUDs increase the risk of acquiring the human immunodeficiency virus (HIV) is not known. Because information on this issue is sparse, use your clinical judgment in determining a potential user's risks.³⁵ The effect of IUDs on the uterine lining may create an environment favorable to HIV transmission. It is possible that the increased bleeding associated with the use of some IUDs may increase the transmission of the virus from HIV-positive women to their partners. According to one study, women who used other contraceptives or none at all had lower risks of HIV after exposure

than did IUD users.¹⁸ However, another study from Kenya could find no increased risk of acquiring HIV among IUD users.¹⁷

3. **Menstrual Problems.** Increased menstrual pain (dysmenorrhea) may accompany IUD use. From 10% to 15% of IUD users have their IUD removed because of symptoms or signs associated with bleeding or spotting.^{7,11} However, the blood is usually minor and of little consequence. The LNG-20 IUD actually decreases bleeding. Inserting this IUD in a woman with heavy bleeding will substantially decrease the bleeding. Many users will even experience amenorrhea.¹⁶
4. **Expulsions.** From 2% to 10% of IUDs are spontaneously expelled within the first year. One study found that risk factors for Cu T 380A expulsion were young age, an abnormal amount of menstrual flow, and severe dysmenorrhea before IUD insertion.⁴³
5. **Pregnancy.** Half of intrauterine pregnancies that occur with the IUD in place end in spontaneous abortion.^{15,38} If the IUD is removed early in pregnancy, the spontaneous abortion rate drops to about 25%.¹⁵ Leaving the IUD in place during pregnancy increases the risk that the mother will have severe pelvic infection that leads to her death.⁴

About 5% of women who become pregnant with an IUD in place will have an ectopic pregnancy.³⁸ Women who use the Progestasert System have a rate of ectopic pregnancy 6 to 10 times that of women who use copper IUDs.² Although the IUD labeling may identify never-pregnant (nulliparous) women as a group that should not receive an IUD, most scientific evidence indicates that the IUD is an option for nulliparous women. Nevertheless, the risks that may lead to impaired fertility need to be discussed with your client.

PRECAUTIONS

Informed consent is required of any woman who will have an IUD inserted. Women at greater risk of complications should consider another method of contraception. Table 15:2 lists World Health Organization's (WHO's) precautions.⁴¹

Table 15:2 Precautions to use of intrauterine devices (copper containing)

Condition	Category	Rational/Comments
Pregnancy	4	As no method is indicated, any health risk is considered unacceptable. However, there is no known harm to mother or fetus if IUD is used during pregnancy.
Breastfeeding		
a) <6 wks postpartum	1	Not a concern. No need for restriction of IUD use.
b) 6 wks to 6 mths postpartum (primarily breastfeeding)	1	
c) >6 mths postpartum	1	
Age		
a) Menarche—age 20	2	Concern about risk of expulsion in younger age-groups.
b) > Age 20	1	
Smoking		
a) Age <35	1	
b) Age >35		
i) light	1	No concern regarding risk of thrombosis with IUD use.
ii) heavy	1	
Essential Hypertension		
a) Mild hypertension (<180/105)	1	
b) Moderate and severe hypertension	1	Not a concern. No need for restriction of IUD use.
c) Vascular disease	1	
History of preeclampsia	1	Not a concern. No need for restriction of IUD use.
Diabetes		
a) History of gestational disease	1	

1 = used in any circumstance

2 = generally used

3 = usually not used unless other more appropriate methods are not available or acceptable

4 = not to be used

Table 15:2 Precautions to use of intrauterine devices (copper containing) (Continued)

Condition	Category	Rational/Comments
Diabetes — <i>continued</i>		
b) Non-vascular disease:		
i) non-insulin dependent	1	Not a concern. No need for restriction of IUD use.
ii) insulin dependent	1	
c) Nephropathy retinopathy	1	
d) Other vascular disease or diabetes of >20 years' duration	1	
Venous Thromboembolism (VTE)		
a) Current and history of VTE	1	
b) Major surgery		
i) with prolonged immobilization	1	Not a concern. No need for restriction of IUD use.
ii) major surgery without prolonged immobilization	1	
c) Minor surgery without immobilization	1	
d) Varicose veins	1	
e) Superficial thrombophlebitis	1	
Current and history of ischemic heart disease	1	Not a concern. No need for restriction of IUD use.
Stroke		
a) Current (in hospital)	1	Not a concern. No need for restriction of IUD use.
b) History	1	

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Table 15:2 Precautions to use of intrauterine devices (copper containing) (Continued)

Condition	Category	Rational/Comments
Familial hyperlipidaemia	1	Not a concern. No need for restriction of IUD use.
a) Uncomplicated	1	Prophylactic antibiotics are advised if the woman is not already receiving long-acting antibiotics.
b) Complicated (pulmonary hypertension, risk of arterial fibrillation, history of SBE, anticoagulant treatment)	2	
On anticoagulant drugs	2	IUD use may be associated with prolonged bleeding in the first few months after insertion. It is unknown if anticoagulants aggravate the bleeding.
Headaches		
a) Mild	1	Not a concern. No need for restriction of IUD use.
b) Severe:		
i) recurrent, including migraine, <i>without</i> focal neurologic symptoms	1	
ii) recurrent, including migraine, <i>with</i> focal neurologic symptoms	1	
Irregular menstrual patterns (cyclic pattern maintained)		
a) <i>Without</i> heavy bleeding	1	Changes in menstrual bleeding patterns are common among healthy women.
b) <i>With</i> heavy bleeding	2	
Unexplained vaginal bleeding (cyclic pattern disrupted)		
a) Before/during evaluation	4	Evaluation of the underlying pathological condition (such as pregnancy, pelvic malignancy) is required.
b) After evaluation		
d) Trachomatis or N. Gonorrhoea	4	
e) Vaginitis without purulent cervicitis	2	

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Table 15:2 Precautions to use of intrauterine devices (copper containing) (Continued)

Condition	Category	Rational/Comments
Unexplained vaginal bleeding — <i>continued</i>		
f) Increased risk of STDs (e.g. multiple partners or partner who has multiple partners)	3	
STIs: current or within 3 months	4	Serious concern that IUD increases risk of PID.
HIV/AIDS		
a) HIV positive	3	
b) High risk of HIV	3	
c) AIDS	3	
Biliary tract disease		
a) Symptomatic		Not a concern. No need for restriction of IUD use.
i) surgically treated	1	
ii) medically treated	1	
iii) current	1	
b) Asymptomatic	1	
History of cholestasis		
a) Pregnancy-related	1	Not a concern. No need for restriction of IUD use.
b) Past hormone-related	1	
Viral hepatitis		
a) Active symptomatic	1	Not a concern. No need for restriction of IUD use.
b) Asymptomatic	1	
c) Carrier	1	
Cirrhosis	1	Not a concern. No need for restriction of IUD use.

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Table 15:2 Precautions to use of intrauterine devices (copper containing) (Continued)

Condition	Category	Rational/Comments
Liver neoplasia		
a) Benign (adenoma)	1	Not a concern. No need for restriction of IUD use.
b) Malignant (hepatoma)	1	
Schistosomal fibrosis		
	1	Not a concern. No need for restriction of IUD use.
Past ectopic pregnancy		
a) Subsequent pregnancy desired	3	Risk of future ectopic pregnancy is increased among women who have had an ectopic pregnancy in the past.
b) Subsequent pregnancy not desired	3	
Obesity		
	1	Not a concern. No need for restriction of IUD use.
Thyroid		
a) Simple goitre	1	Not a concern. No need for restriction of IUD use.
b) Hyperthyroid	1	
c) Hypothyroid	1	
Thalassaemia		
	2	
Trophoblast disease (current and recent history)		
	2	
Sickle cell disease		
	2	
Iron deficiency anaemia		
	2	Concern about increased blood loss in initial months of use.
Epilepsy		
	1	Not a concern. No need for restriction of IUD use.
Schistosomiasis		
	1	Not a concern. No need for restriction of IUD use.
Malaria		
	1	Not a concern. No need for restriction of IUD use.

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Table 15:2 Precautions to use of intrauterine devices (copper containing) (Continued)

Condition	Category	Rational/Comments
Drug interactions		
a) Antibiotics	1	Not a concern. No need for restriction of IUD use.
b) Drugs affecting liver enzymes	1	
Parity		
a) Nulliparous	2	Concern that nulliparity is related to risk of expulsion and concern about future childbearing.
b) Parous	1	
Rapid return to fertility desired	1	Return to fertility not affected.
Anatomical abnormalities		
a) Distorted uterine cavity (any congenital or acquired uterine abnormality distorting the uterine cavity in a manner that is incompatible with IUD insertion)	4	In the presence of an anatomic abnormality that distorts the uterine cavity, proper IUD placement may not be possible.
b) Other abnormalities (including uterine fibroids, cervical stenosis, or cervicallacerations) not distorting the uterine cavity or interfering with IUD insertion	2	Abnormalities not distorting the uterine cavity generally do not interfere with proper placement.
Severe dysmenorrhoea	2	Dysmenorrhoea may intensify with IUD use.
Immediate post partum including post abortion		
a) First trimester	1	Slightly increased risk for uterine perforation and expulsion if the IUD is inserted early in the postpartum period or following second trimester abortion.
b) Second trimester	2	
c) Postpartum	2	

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PROVIDING THE METHOD

Obtain a medical history and advise the client about whether the IUD is suitable for her. Discuss her risk factors and the safety and effectiveness of the IUD.

TYPES OF IUDS

IUDs have been made in various shapes, including rings, loops, spirals, T-shapes, and 7-shapes. The materials used have included silver, copper, and plastic. There are two categories of IUDs: those that are medicated and release hormones or copper and those that are not medicated. In Africa, the most commonly used IUDs are the Cu T 380A, and the Multiload 375 and 250. Those less frequently used include the Levonorgestrel IUD, the Copper T 200 and 220C, the stringless single-coil stainless steel ring, the Progestasert System, and the Cu-Fix. (See Figure 15:1.)

Cu T 380A. This IUD is Africa's most commonly inserted type for new IUD users. More than twenty five million Cu T 380A IUDs have been distributed in 70 countries.¹⁸ The Cu T 380A comes in pre-sterilized packages. The T shape is made with polyethylene. Barium sulphate is added to create x-ray visibility. Fine copper wire is wound around the vertical stem, and each of the two horizontal transverse arms has a sleeve of copper measuring 33 mm. The bottom of the T has a single filament of clear or whitish polyethylene string that is knotted after passing through a hole in the T, creating a double string effect. The upper limbs of the "T" are folded down into the inserter barrel no more than 5 minutes before insertion. The inserter tube is inserted so that it just touches the top of the fundus. The outer inserter tube is then retracted about 1 cm to release the arms of the device. The diameter of the inserter is 4.4 mm, but only the tips of the arms fit in the tube.

Multiload 375 and Multiload 250. These devices come in pre-sterilized packages and are preloaded in an inserter tube. Insert these IUDs by retracting the outer barrel over the inserter rod. The vertical limbs of these devices have surfaces of 375 mm² or 250 mm² of copper.

Both the Multiload 375 and the Multiload 250 come in three sizes: standard, short, and SL (mini).

Levonorgestrel IUD. This new IUD is a highly effective contraceptive method developed by Leiras. Its active substance, levonorgestrel, is released directly into the uterus at a constant rate of 20 mcg per day for up to 5 years. This kind of delivery decreases the systemic effects of the hormone. The levonorgestrel IUD is based on a NOVA T model polyethylene frame and has a cylinder of polydimethyl-siloxane-levonorgestrel molded around its vertical arm. The cylinder is coated with a membrane that regulates the release of the hormone.

Copper T 220C. This IUD also comes in a presterilized package. Insert this IUD using the withdrawal technique. The IUD can be loaded and cocked into the barrel without the clinician touching the IUD. Although it may be initially difficult to fold the upper limbs of the “T” down into the inserter barrel, the procedure becomes easier with practice.

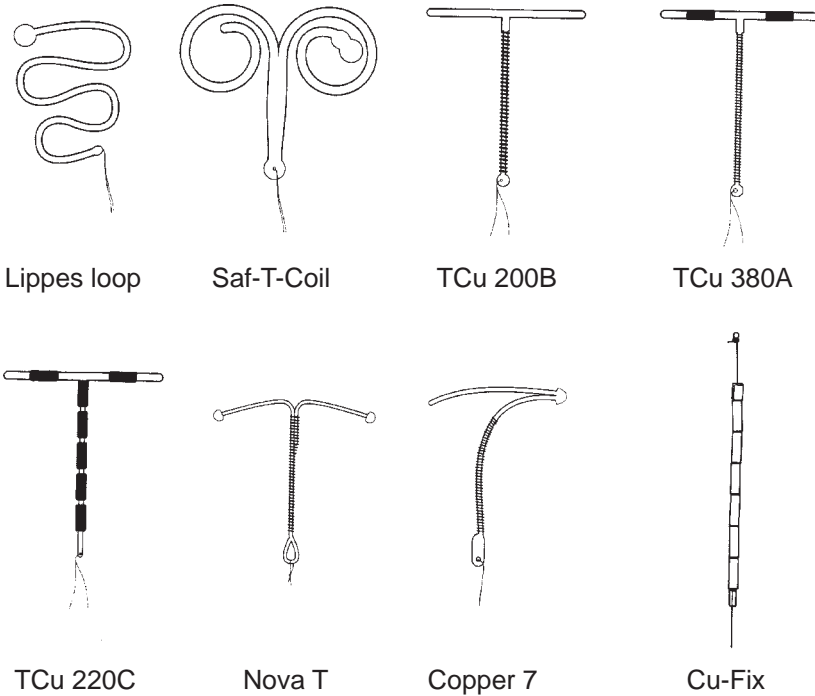
Stringless, single-coil stainless steel ring. This ring is the most widely used IUD in China. Rings come in sizes ranging from A (smallest) to D (largest). The size of the ring used depends on the sounding depth of the uterus. The rings come in either prepackaged sterile units or less expensive packages containing 100 rings that must be sterilized with an iodine (1:2,500 for Betadine) or benzalkonium antiseptic solution for 30 minutes before use. The usual method of insertion involves using an inserter rod to push the device into the uterine cavity.

Progestasert System. This system is approved for 1 year of contraceptive protection, after which it must be replaced. Because of its short usable life, the Progestasert System should be used only in unusual circumstances (such as allergy to copper). This IUD comes in a separate pre-sterilized package. It is shaped like a “T” and consists of ethylene vinyl acetate copolymer. The vertical stem contains a reservoir of 38 mg progesterone and barium sulphate (for visibility on x-rays) in a silicone oil base. It releases 65 mg progesterone per day. The IUD is 36 mm long, 32 mm wide, and when placed in the inserter barrel, has a diameter of 8 mm. The blue-black double string is

attached at a hole in the base of the T. The Progestasert System must be inserted by the withdrawal technique.

Cu-Fix. This frameless IUD has six copper sleeves strung on a surgical nylon thread knotted at one end. During insertion this knot is pushed into the myometrium with a notched needle that works like a miniature harpoon. It is expected to have low rates of expulsion or removal for bleeding or pain because it is frameless.²⁹

Figure 15:2 Types of IUDs



Source: Speroff and Darney (1992)

FACTORS TO CONSIDER IN CHOOSING AN IUD

Safety and effectiveness depend more on the skill of the IUD inserter and the quality of counseling, selection, and follow-up than on the type of IUD used.³⁴ With appropriate training, nurses, nurse-midwives, physician assistants, paramedical personnel, and rural village midwives can safely perform routine IUD insertions. Clinicians should practice first on a model, then insert an adequate number of IUDs under supervision. The clinical supervisor should determine the criteria for competence. Competence should not be judged simply by the number of IUDs inserted; it should be based on the ability to consistently demonstrate safe clinical judgment and correct insertion skills.

IUD INSERTION

The IUD can be inserted any time during the menstrual cycle. It is not necessary to wait for the woman to have her menses.³⁹ Of course, the IUD should never be inserted into the uterus of a pregnant woman. If there is any question of pregnancy, perform a pregnancy test or delay insertion until the next menstrual flow, which usually indicates that the woman is not pregnant. A woman who is not pregnant may have an IUD inserted at the following times:

- At any time in the menstrual cycle
- Within 7 days of unprotected intercourse, if the woman wants an emergency (postcoital) contraceptive device
- Immediately following childbirth (within the first 10 minutes); if the IUD is inserted 1 or 2 days after childbirth, there is a greater risk of expulsion as the uterus contracts⁴²
- Within 6 weeks postpartum
- Immediately after or within 3 weeks of an uncomplicated first trimester spontaneous or legally induced abortion
- Within 6 months of childbirth if the woman is lactating, amenorrheic, and normal upon physical exam

INSERTION TECHNIQUE — GENERAL PRINCIPLES

Teaching clinicians respect for clients and confidence in working with them is the centerpiece of training. *Proceed slowly and gently during all phases of IUD insertion.* Since insertion methods differ slightly for the various IUDs, always read and follow the manufacturer's instructions on IUD insertion. The methods differ depending on the size and shape of the IUD, inserter barrel, plunger, packaging, and strings. (See Figure 15:3.)

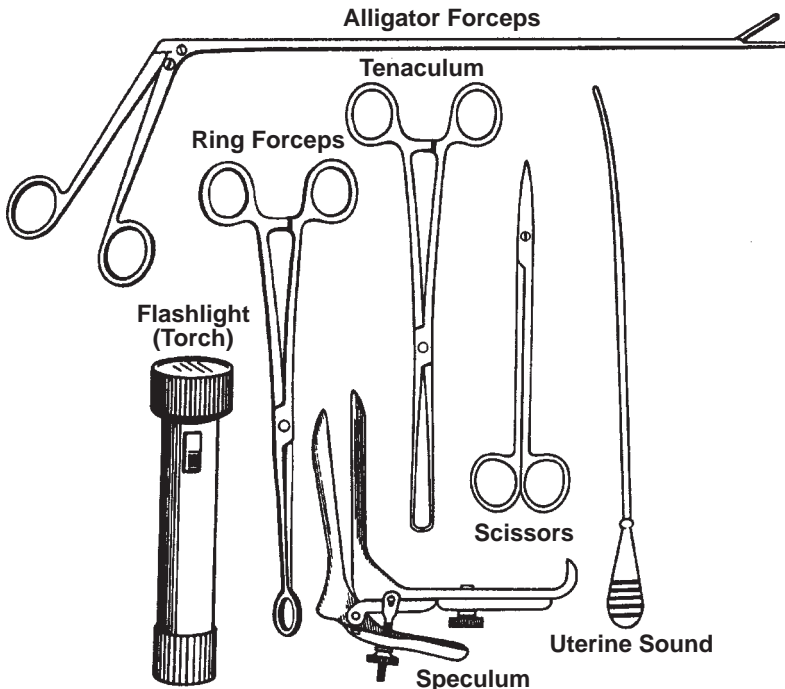
1. Explain the IUD insertion procedure to the patient. Answer questions, eliminate myths about the method, and create a comfortable, confident atmosphere for the client.
2. Administer an analgesic agent or antiprostaglandin prior to insertion, which may reduce discomfort.
3. Perform a careful visual and bimanual exam to rule out pregnancy and active pelvic infection and to diagnose the position of the uterus. IUD perforations usually occur at 90 degrees to the axis of the fundus. An unrecognized retroflexed uterus increases the possibility of uterine perforation at the time of IUD insertion.
4. Use sterile instruments to clean the cervix. After you have inserted a warm speculum and viewed the cervix, apply an antiseptic solution such as 1:2,500 iodine in a motion of concentric circles beginning at the os and spiraling outward on the cervix. If the patient is allergic to iodine, use a chlorhexidine (Hibiclens) solution.

Table 15:3 Intrauterine device termination rates (per 1,000 women) during first and second months after insertion

Reason for termination	Menstrual cycle day of insertion				All cycle days
	1-5	6-10	11-17	18+	
Expulsion	50.3	30.5	24.0	22.0	39.6
Pregnancy	3.0	4.1	4.8	6.1	3.7
Pain and bleeding	20.9	20.6	27.2	36.7	22.7
Miscellaneous bleeding	5.9	7.9	4.8	9.8	6.8
Personal	25.6	30.9	17.6	19.6	26.2
Pelvic infection	3.0	3.1	3.2	1.2	2.9
Total	108.7	97.1	81.6	95.4	101.9

Source: White (1980)

Figure 15:3 Minimal equipment for IUD insertion



5. In some instances, you may inject intracervical local anesthesia at this point (see the section on “Paracervical Anesthesia or Paracervical Block”).
6. Grasp the anterior lip of the cervix with a tenaculum about 1.5 to 2.0 cm from the os. Close the single-tooth tenaculum slowly, one notch at a time. (Using a small amount of local anesthesia may decrease the discomfort of tenaculum placement.)
7. Sound the uterus slowly and gently. Place a cotton swab at the cervix when the sound is all the way in. Remove the sound and the swab at the same time to measure the depth of the fundus to within 0.25 cm.
8. Load the IUD into the inserter barrel. Use sterile conditions. To minimize the chance of introducing contamination, do not remove the IUD from the insertion tube before placing it in the uterus. Do not bend the arms of the “T” more than 5 minutes before it is to be introduced into the uterus. Strict aseptic techniques can be

maintained in the absence of sterile gloves by folding the arms through the packaging. Use a flat surface and pull the solid rod partially from the package (so it will not interfere with assembly).

9. Insert the IUD into the cavity of the uterus by retracting the outer barrel over the plunger (this is the withdrawal technique). (See Figure 15:4.) Insertion should be done slowly and without much force.
10. To guarantee high fundal placement, gently push the inserter tube until resistance is felt.
11. Release the IUD, withdrawing the insertion tube no more than 1 cm while the solid rod is not permitted to move. This movement releases the arms of the “T”.
12. Withdraw the solid rod while holding the insertion tube stationary.
13. Withdraw the insertion tube from the cervix.
14. Clip the strings. Be sure enough of the strings are visible (2.5 cm) to facilitate checking for the presence of the IUD. Note the length of the visible strings in the patient record.
15. Some clinicians have the patient feel for the strings of her IUD before she leaves the exam room. At the very least, as part of the counseling process explain to the client how to locate the string.

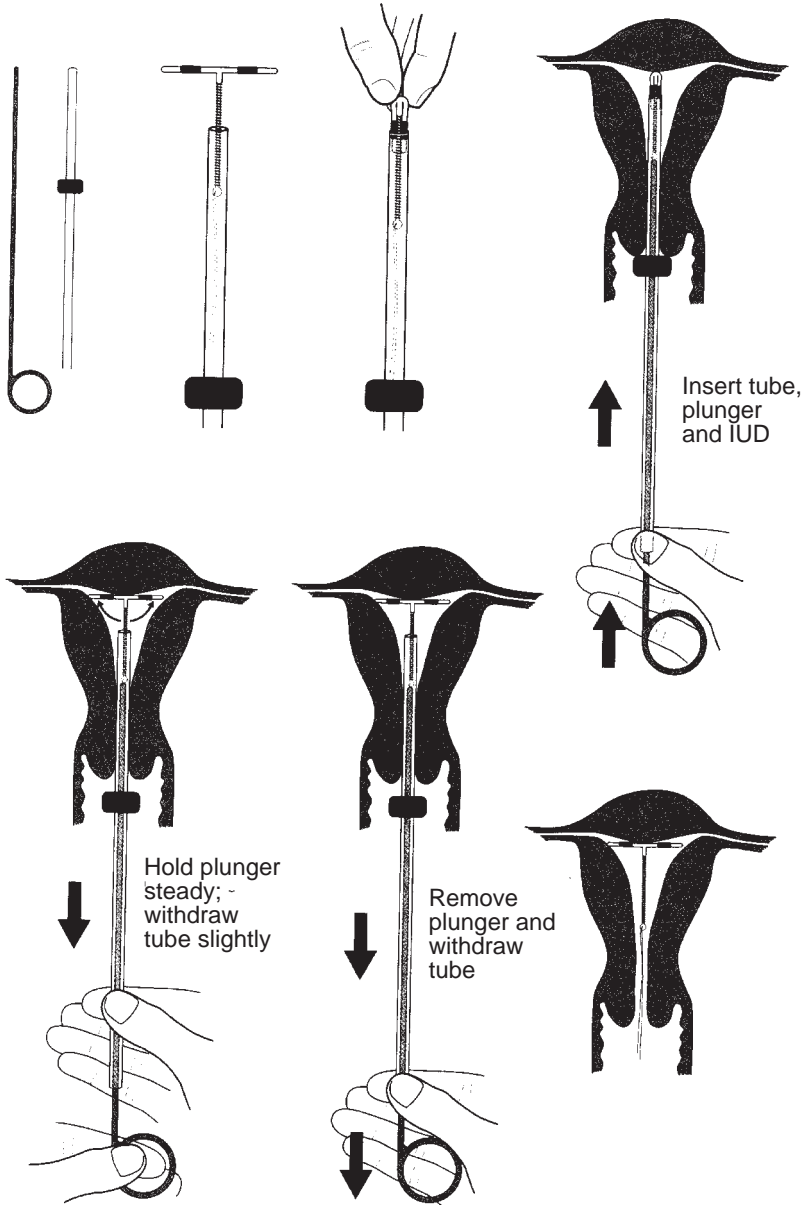
Cardinal Rule for IUD Insertion

*Everything done at the time of IUD insertion and removal
CAN and SHOULD be done slowly and gently.*

IUDS IN NULLIPAROUS WOMEN

Women who have never been pregnant may use an IUD safely, but they may wish to consider another type of contraceptive method. Compared to women who have given birth (parous women), nulliparous women are more likely to experience an IUD expulsion, cramping, or bleeding. Insertion also is more difficult because the cervical os and uterine cavity are smaller.⁷

Figure 15:4 Withdrawal technique



Source: Speroff and Darney (1992)

PROPHYLACTIC ANTIBIOTICS AND IUD INSERTION

There is a general consensus that prophylactic antibiotics should *not* be used routinely at IUD insertion as a measure to prevent subsequent infection. However, two published studies on the subject are at odds; one supports this position but the other does not.^{13,27} Some clinicians provide women with prophylactic antibiotics at the time of IUD insertion in areas where STIs are common. Observe the following guidelines for using prophylactic antibiotics before IUD insertion:

- Assess the patient to make sure she has no precautions to IUD insertion, no clinically acute infection, and no contraindications to taking antibiotics.
- Give the woman 200 mg of doxycycline orally at the time of insertion and 100 mg 12 hours later.
- Give breastfeeding women 500 mg of erythromycin orally 1 hour before insertion or at the time of insertion and 500 mg orally 6 hours after insertion. (Doxycycline is contraindicated during pregnancy and lactation because of potential effects on newborns.)

IMMEDIATE POSTPARTUM INSERTION OF IUDS

If labor and delivery were normal, the uterus is firm, and bleeding has subsided, a Cu T 380A may be inserted. Inserting the IUD immediately following delivery of the placenta (postplacental insertion) or during the first week after delivery (postpartum insertion) is safe and convenient. There is no increased risk of infection, perforation, or bleeding.^{8,34} To reduce the risk of infection, use a sterile long-sleeved glove. (See Table 15:4.)

A major drawback to inserting the IUD so soon following delivery is the high rate of expulsion. Reported rates have ranged from 9% in a Chinese study⁴⁴ to 22% in a Family Health International multicenter trial,⁹ to 31% to 41% in a WHO multicenter trial.⁴² The expulsion rate for copper-bearing IUDs appears to be lower than the expulsion rate for the stringless, single-coil stainless steel ring.³⁴ The chance of expulsion can be reduced if the clinician is experienced in

IUD insertion, an ergot preparation is used to enhance uterine contractility,²¹ and the following steps are taken:

1. Massage the uterus until bleeding subsides.
2. Insert the IUD within 10 minutes of delivery of the placenta.
3. Administer methergine (+/-) but no antibiotics, analgesics or anesthesia.
4. Grasp the IUD with ring forceps.
5. Grasp the cervix with the second ring forceps.
6. Manually place the IUD in the uterine cavity.
7. Grasp the uterus with the hand you have placed on the abdomen.
8. Place the IUD high in the fundus.
9. Release the IUD and rotate the ring forceps 45 degrees.
10. Release the forceps and remove.

Discuss with your client the potential for IUD expulsion. This discussion will help to ensure that the client will return for a follow-up visit after insertion. Also tell her that, despite higher expulsion rates, cumulative pregnancy rates for immediate postpartum IUD insertion are comparable to or lower than those for interval IUD insertions, perhaps because women are less fertile in the postpartum period.²¹ With modern copper IUDs, proper insertion techniques, and adequate follow-up, the pregnancy rate after 24 months following postpartum IUD insertion is 2.0 to 2.8 per 100 users.²¹

The string of the Cu T 380A may lie entirely within the uterine cavity after postplacental insertion. If a postpartum woman is examined 1 month after delivery and the string is not visible, determine the location of the Cu T 380A. Use a sound, alligator forceps, or other sterile instrument to explore the uterine cavity (pregnancy at 4 weeks postpartum is very unlikely). If you detect the IUD in the uterus, tease the string down to the cervical os. Otherwise, as long as you have confirmed the presence of the IUD during sounding, simply leave both the IUD and the string in the uterine cavity.

Table 15:4 Advantages and disadvantages of post-placenta or immediate postpartum IUD Insertion

Advantages	Disadvantages
<ul style="list-style-type: none"> • Patient already at health facility • Contraindication of pregnancy is not present • Fewer complaints of pain and bleeding • Risk of perforation is same or lower • Lower cost • Insertion technique is easier to master 	<ul style="list-style-type: none"> • Expulsion rates higher • Continuation rates slightly lower • Higher rates of missing strings • Counseling postpartum is difficult • Special instructions needed for expulsions

Source: O'Hanley and Huber (1992); Stewart (1993)

PARACERVICAL ANESTHESIA OR PARACERVICAL BLOCK

A paracervical block using no more than 10 to 20 cc of 1% lidocaine without epinephrine can prevent the pain of an IUD insertion or a difficult removal. Paracervical anesthesia is particularly beneficial at the time of insertion for a woman who has never been pregnant or for a woman who has a history of vasovagal reactions. Remember to ask the patient whether she has any known allergies, especially to iodine or any local anesthetic. A suggested procedure for performing a paracervical block is as follows:

1. Perform a bimanual pelvic exam; insert a speculum in the vagina to obtain good visualization of the cervix.
2. Clean the cervix and vagina with antiseptic material.
3. Ask the patient to inform you if she experiences nausea, dizziness, ringing of the ears, or tingling of the lips from the procedure. It is not uncommon for these symptoms to occur, but they will pass quickly.
4. Inject 2 cc of lidocaine at the tenaculum site and then apply the tenaculum to the upper lip of the cervix.
5. Inject the lidocaine around the cervix. Different clinicians use different placements of the injections. One technique is to inject 2 to 5 cc at sites corresponding to 4 o'clock or 5 o'clock and 7 o'clock or 8 o'clock on a clock face (a total of 4 to 10 cc).

6. Insert the needle just under the mucosa in the connective tissue. This method assures rapid and adequate distribution of the anesthetic because most of the smaller blood vessels and capillaries are in this region. Aspirate lightly with each injection to avoid direct intravenous injection.

A serious reaction will be extremely unlikely to occur if the total used is less than 20 cc. Anesthesia takes effect in 2 to 5 minutes.

IUD REMOVAL

Follow the rules for IUD removal:

- Remove the IUD at the time of menses or at midcycle. Removal at these times may be easier than at other times during the cycle.
- Use a paracervical block to make the removal easier for both the provider and the client. A block is especially helpful for clients who are prone to fainting, have severe cramps, or are nulliparous.
- Apply gentle, steady traction to prevent the string from breaking during IUD removal.
- If you do not see the strings, probe for them in the cervical canal with narrow forceps (or the alligator forceps).
- If you cannot remove the IUD with gentle traction, use a tenaculum to steady the cervix and reduce the anteversion or retroversion to assist removal. If this does not work, dilate the cervix with dilators. Dilators should always be available in a clinic that manages IUD complications. For difficult removals, use a laminaria tent to dilate the cervix.
- When the IUD (with or without its strings) is in the uterus, probe the endometrial cavity with alligator forceps (with which the strings or the IUD itself may be grasped), a hook, uterine packing forceps, or a Novak curette. Proficiency in removing the IUD with one of these instruments when the strings are absent or entirely within the uterine cavity can prevent unnecessary hospitalizations.

MANAGING PROBLEMS AND FOLLOW-UP

Serious side effects and complications from IUDs are usually preventable. The rule of thumb is *when in doubt, take an IUD out*. Seven potential complications from IUDs are listed in order of increasing severity.

SPOTTING, BLEEDING, HEMORRHAGE, AND ANEMIA

The average user of a nonmedicated IUD has an increase in blood loss, which is usually minor and of little consequence. However, 10% to 15% of IUD users will have their IUD removed because of symptoms and signs associated with bleeding or spotting. Before inserting an IUD, make the patient aware of the likelihood of bleeding changes. Abnormal bleeding can also be a sign of pregnancy or infection—two problems that must always be ruled out during the process of evaluating IUD clients.

1. If the patient has a hemoglobin (Hgb) level of less than 11.5 gm at insertion
 - provide her with FeSO₄* (300 mg) to take 1 tablet daily for 1 to 2 months
 - instruct in proper nutrition, including iron-rich foods
 - repeat Hgb at 3 month follow-up
 - reassure the patient that the bleeding will likely decline in subsequent cycles
 - provide FeSO₄* (as in step 1)
 - provide ibuprofen[†] 400 mg t.i.d. for first 3 days of cycle
 - examine for other pathology and/or symptoms such as:
 - cancer of the cervix and uterus
 - cervical and uterine polyps
 - leiomyomat
 - postcoital bleeding
 - chronic cervicitis
 - dysfunctional uterine bleeding

2. If within 3 months of insertion the IUD user complains of excess bleeding
 - reassure the patient that the bleeding will likely decline in subsequent cycles
 - provide FeSO₄ (as in #1)
 - provide ibuprofen* 400 mg t.i.d. for first 3 days of cycle
 - perform Hgb and treat as steps 1, 6 and 8
 - examine for other pathology and/or symptoms such as:
 - cancer of the cervix and uterus
 - cervical and uterine polyps
 - leiomyomata
 - postcoital bleeding
 - chronic cervicitis
 - dysfunctional uterine bleeding

3. If at any time the excess bleeding is associated with pain
 - examine the patient to rule out a pelvic infection
 - consider a sensitive pregnancy test to rule out pregnancy (including ectopic pregnancy)

4. If the Hgb is less than 9 gm
 - remove IUD
 - provide FeSO₄ (300 mg) daily for 2 months
 - repeat Hgb at 1 month
 - provide alternative method of contraception

5. If there is a Hgb fall of >2 gm
 - remove IUD
 - treat as in #4

6. If bleeding is thought to be associated with endometritis
 - remove IUD
 - culture for gonorrhea
 - treat with antibiotics (Doxycycline for 10 days)
 - treat partner
 - provide an alternative method of contraception

- | | |
|--|--|
| 7. If the client desires IUD removal because bleeding is not tolerable | <ul style="list-style-type: none"> • remove IUD • provide alternative method of contraception |
| 8. If the client is over 40 years old and having prolonged menses with intermenstrual bleeding | <ul style="list-style-type: none"> • remove the IUD • refer for diagnosis and treatment if abnormal bleeding continues |

*Ferrous gluconate is also acceptable, may be less expensive, and may cause less gastric upset.

†Ibuprofen is an example of one of the nonsteroidal antiinflammatory drugs that can reduce cramping and bleeding.

CRAMPING AND PAIN

The patient may feel slight pain at the time of insertion of an IUD. She may continue over the next 10 to 15 minutes to feel cramping pain, which soon disappears. Increased menstrual pain (dysmenorrhea) may accompany IUD use. Approximately 15% to 40% of IUD removals are for complaints related to pain. Cramping and abdominal pain may be a sign of pregnancy or infection, two problems you must always rule out when evaluating IUD users with abdominal pain.

- | | |
|--|--|
| 1. Pain with sounding of the uterus during insertion | <ul style="list-style-type: none"> • sound slowly and gently • consider smaller sound • if severe, stop and check the alignment of the uterine cavity, if the cavity is normal, use a paracervical block |
| 2. Cramping/pain immediately after insertion, for a day or so thereafter and/or with each menses | <ul style="list-style-type: none"> • if severe: <ul style="list-style-type: none"> — consider IUD removal • if mild: <ul style="list-style-type: none"> — provide mild analgesia such as acetaminophen 1 gm, every 4 hours as needed, or ibuprofen 400 mg, every 4 hours as needed |

3. Pain at time of insertion, persistent and increasing, plus additional signs of abdominal tenderness
 - if strings are present:
 - presume partial perforation has occurred; remove IUD and treat as pelvic infection
 - if strings are present but the IUD is not:
 - consider the possibility of perforation (see IUD removal section)
 - remove the IUD
 - if there is no infection of cervix or uterus:
 - insert another IUD
 - provide 5-7 days of Doxycycline, 100 mg every 12 hours
 - if there is an infection of the cervix or uterus or the possibility of infection:
 - remove the IUD
 - provide alternative contraception
 - treat with antibiotic as above and insert another IUD after 3 menstrual cycles
4. Partial expulsion of an IUD
 - remove IUD, treat as described in the section on PID
 - provide alternative contraception
5. Pelvic inflammatory disease
 - remove IUD, treat as described in the section on PID
 - provide alternative contraception

6. Severe post-insertion pain with fainting

- give spirits of ammonia by nasal inspiration
- if placement is improper:
 - remove the IUD, reevaluate the uterus, resound, and insert another IUD
- if the IUD is felt to be properly positioned and the client's pulse is less than 60:
 - consider giving atrophine 0.4-0.6 mg intramuscularly or intravenously
 - consider using a paracervical block
 - provide pain medication (i.e. acetaminophen or ibuprofen)
 - remove the IUD if necessary

7. Spontaneous abortion

- remove IUD
- treat according to the section on Pregnancy

8. Ectopic pregnancy

- treat according to the section on Pregnancy

EXPULSION OF THE IUD (PARTIAL AND COMPLETE)

From 2% to 10% of IUD users spontaneously expel their IUD within the first year. The symptoms of an IUD expulsion include unusual vaginal discharge, cramping or pain, intermenstrual spotting, postcoital spotting, pain during intercourse (male and female), lengthening of the IUD string, and presence of the hard plastic of the IUD at the cervical os or in the vagina. If in examining the patient you do not feel an IUD string, suspect an expulsion.

1. If the IUD string is not felt, an expulsion may have occurred

- | | |
|-------------------------------------|---|
| 2. If a menstrual period is delayed | <ul style="list-style-type: none"> • check for the IUD string and evaluate for a pregnancy because this may be the first indication of a “silent” expulsion and pregnancy |
| 3. If partial expulsion | <ul style="list-style-type: none"> • remove the IUD • evaluate for pregnancy and/or infection <ul style="list-style-type: none"> — if present, treat as indicated • if neither pregnancy nor infection are present, insert another IUD and give 5 to 7 days of Doxycycline 100 mg every 12 hours |
| 4. If the expulsion is complete | <ul style="list-style-type: none"> • evaluate for pregnancy • insert another IUD if patient is not pregnant and has no infection |

STRING PROBLEMS

- | | |
|-----------------------------------|---|
| 1. Partner is irritated by string | <ul style="list-style-type: none"> • counsel partner at time of insertion that he may feel the string, but it usually won't hurt him • if the string has a short, sharp point coming from the cervix <ul style="list-style-type: none"> — the string may be cut shorter and the new length carefully recorded — the IUD may need to be removed and replaced, and the new string made longer • if the string is long: <ul style="list-style-type: none"> — try shortening the string — occasionally, the IUD needs to be removed (see next set of instructions) |
|-----------------------------------|---|

2. String is long
- rule out expulsion by exam and by sounding of cervix
 - if the IUD seems to be in place: trim the string
 - if there is any doubt about the IUD being in place:
 - remove the IUD and replace with a new IUD
3. String is absent (as determined by patient or examiner)
- if menses has been missed:
 - rule out pregnancy by exam and test. If both are negative, evaluate as noted below. If pregnancy is detected, consult the next section.
 - if menses has not been missed and no abdominal pain is present:
 - use another method of contraception and wait until next menses; examine during next menses
 - if the IUD string is not present, then prepare the cervix as per IUD insertion technique and explore the uterus with alligator forceps
- i) if the IUD is found:
- if the IUD does not seem to be disturbed, reposition the string, treat the patient with antibiotics, and follow the patient routinely
 - if there is any question of IUD dislodgement or abnormal placement or position, remove the IUD, treat the client with an antibiotic, and insert another IUD

- ii) if the IUD is not found:
 - refer the client to a higher level facility
 - obtain an ultrasound (or X-ray)
 - a) if the IUD is not seen on ultrasound or X-ray:
 - do a pregnancy test
 - insert another IUD per insertion guidelines
 - b) if the IUD is seen on the ultrasound:
 - clarify the location of the IUD and rule out perforation; may need to insert another IUD; take an x-ray or ultrasound of the pelvis
 - if perforation has occurred, treat it accordingly
 - if no perforation has occurred, then the x-ray should show 2 IUDs in the uterus (usually both will have to be removed and another inserted)

PREGNANCY

Approximately one-third or fewer of IUD-related pregnancies are attributable to undetected or partial expulsions. Abortion and severe pelvic infection are more likely if the IUD is left in place during a pregnancy. About 5% of pregnancies will be ectopic.

- Inform the patient of the risks from a pregnancy with an IUD in place.
- If abortion is a legal option, determine whether the patient wishes to continue the pregnancy. If the woman is pregnant and the IUD has completely perforated the uterus and is in the abdominal cavity, there may not be any risk to the pregnancy. As the degree of perforation is usually not known, treat the condition as though the IUD were in situ and the string not seen.

- 1) If the patient is undergoing a spontaneous abortion:
 - a) If the patient is in severe pain:
 - empty the uterus of conception products
 - remove the IUD
 - b) If the patient is anemic:
 - provide doxycycline or ampicillin for 7 days
 - check for an ectopic pregnancy
 - provide analgesic medication
 - give FeSo₄
- 2) If the patient requests an abortion
 - refer for a legal abortion
- 3) If the woman wishes to continue the pregnancy and the IUD strings are visible
 - remove the IUD
 - warn the patient that an ectopic pregnancy should be suspected
 - refer the patient for prenatal care
- 4) If the patient wishes to continue the pregnancy and the IUD strings are not visible
 - if signs of an intrauterine infection exist:
 - counsel the patient about the life-threatening situation
 - recommend evacuation of the uterus and treat the patient with antibiotics
 - evacuate and examine the tissue to rule out ectopic pregnancy
 - refer the patient for special obstetric care
 - if no signs of infection exist:
 - inform the patient to watch for signs of infection (such as pain, discharge, bleeding, fever, muscle aches) and of ectopic pregnancy and instruct her where to go should those complications occur
 - refer the client for prenatal care
 - warn the client about the possibility of perforation
 - recover the IUD at delivery

UTERINE PERFORATION, EMBEDDING, AND CERVICAL PERFORATION

The incidence of perforation is approximately 1 in 1,000. Perforation of the uterus by an IUD usually occurs at one of three sites: (1) in the uterine fundus, (2) in the body of the uterus, or (3) through the cervical wall itself. The following guidelines should be used in cases of perforation.

1) IUD plastic device sticking through the cervix

- perform a paracervical block, if needed, to perform the procedure
- provide analgesia
- use alligator forceps to grasp the IUD inside the cervix in the lower uterine cavity, push the IUD back into the uterus, and then remove it through the cervical os
- treat with antibiotics
- provide alternative contraception or insert a new IUD

2) IUD string does not allow IUD to be removed with significant pressure

- try the recommendations in the section on String Problems
- provide a paracervical block
- if the IUD is found in the uterus:
 - use alligator forceps to grasp the IUD in the cervix or uterus and remove
- if the IUD is not removable, refer the client for more specialized care
- if the IUD is not found in the uterus or cervix (and the string is seen):
 - refer the client to a gynecologist
 - provide an alternative method of contraception
 - provide an antibiotic

This is one circumstance where expert help is truly required, because the IUD may be out of the uterus.

3) IUD perforation identified by X-ray or ultrasound and no string visible

- if the client has pain, evidence of bowel obstruction or pelvic infection
 - refer the client to a gynecologist or a general surgeon
 - treat with antibiotics; surgery may be required
- if the client has no pain or evidence of obstruction, infection, or pregnancy
 - provide the patient with alternative contraception
 - inform the patient of signs of obstruction or pelvic infection or where to go if those signs develop
- if the client is pregnant and the IUD is outside the uterus
 - provide information as per pregnancy with IUD in situ

Surgery may be an elective alternative.

PELVIC INFLAMMATORY DISEASE (PID)

PID is a serious complication either from the IUD itself or from exposure to an STI. PID due to the IUD occurs most commonly in the first few weeks following insertion. Regardless of cause, PID needs aggressive treatment and follow-up to be certain it is adequately treated. An IUD should not be reinserted in someone at high risk for developing another pelvic infection. In any patient, wait at least 3 months following treatment for an acute pelvic infection before you insert an IUD. The accurate diagnosis of PID is difficult, but the following signs suggest PID:

- An oral temperature of 38° C or above
- Suprapubic tenderness and guarding
- Tenderness or pain while moving the cervix during pelvic exam

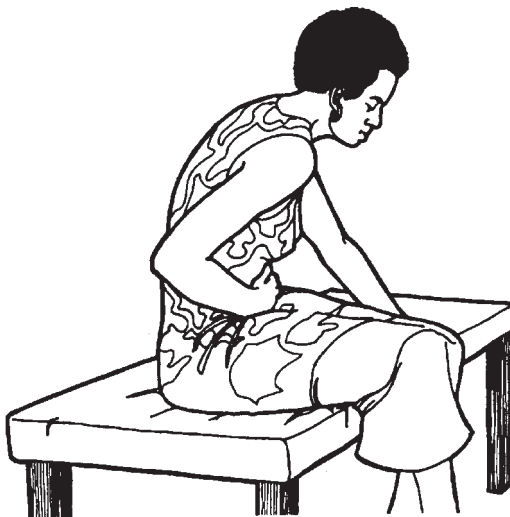
- Purulent discharge from the cervix
- Tenderness of the uterus to palpation
- Adnexal tenderness or adnexal palpable mass or masses

Generally, it is best to treat PID by removing the IUD and giving the woman appropriate antibiotics. If the IUD is left in place, follow-up may be inadequate and a smoldering infection may persist that can progress from endometritis to a more generalized infection. Following an episode of PID, women who want subsequent children should be encouraged to use a method other than an IUD. Pelvic infection during pregnancy can be extremely dangerous.

If the IUD is left in place while the PID is being treated, give a full 10 to 14 days of antibiotics. Reexamine the patient after she has completed her course of treatment. Because the Dalkon Shield is associated with a very high risk of PID, any woman still using a Dalkon Shield should have it removed.

A chronic, foul vaginal discharge in an IUD user is considered to be PID until proven otherwise.

Figure 15:5: Remove the IUD with the first episode of pelvic inflammatory disease



- 1) If patient is pregnant and has symptoms of PID
 - see the section on pregnancy
- 2) If patient has mild pelvic infection, which is defined as a fever of 38° C or lower; no abdominal guarding; mild suprapubic, uterine, and/or adnexal tenderness; and no adnexal masses
 - remove the IUD
 - provide alternative contraception
 - provide treatment (see Chapter 6)
 - reexamine in 1 week
 - advise the patient to seek immediate care if symptoms worsen
- 3) If the patient has moderate pelvic infection, which is defined as a fever lower than 39° C; abdominal guarding; and no rebound, adnexal masses, or vomiting
 - follow the same directions as in #2
 - consider hospitalization
- 4) If the patient has a severe pelvic infection with a fever greater than 39° C; guarding or rebound, pelvic masses, or vomiting and/or appears acutely ill
 - refer her for hospital care

This is a serious, life-threatening problem that needs expert care.

INSTRUCTIONS FOR USERS

After you have your IUD inserted:

- 1. Check your strings.** Before you leave the office or clinic, learn how to feel the strings that protrude 2 inches or so into the vagina. If you cannot feel the strings or if you can feel the plastic part, your IUD may not be protecting you against pregnancy, and you should use another method until you can return to the clinic to have your IUD checked. Your uterus can expel an IUD without your knowing it. Check for the strings frequently during the first few months you have the device, after each period, and any time you have abnormal cramping while menstruating.
- 2. Beware of infection.** When your IUD is inserted, find out where you can go to be treated if you get an infection. If at any time you have fever, pelvic pain or tenderness, severe cramping, or unusual vaginal bleeding, contact your clinician immediately because you may have an infection. IUDs can cause internal pelvic infection (in contrast to vaginal infections) that can lead to chronic pain, hysterectomy, or even death. Women in mutually faithful relationships appear to have little increased risk of infection.¹⁴
- 3. Watch for your periods.** If you miss a menstrual period, contact your family planning worker immediately. The most commonly reported side effects of the IUD are increased menstrual flow, menstrual cramping and spotting, and increased mucous discharge. Remember that if you cannot tolerate the IUD, you can always have it removed. Heavier menstrual bleeding may be serious if you are anemic. However, a small increase in the menstrual flow is normal with the IUD, especially during the first 2 to 3 periods.

No matter what other methods of contraception a woman is using, if she is at any risk because her partner tests HIV positive or because she does not know her partner's HIV status, she should be advised to use latex or plastic condoms with every sexual act. No other contraceptive method besides abstinence provides the same degree of protection.

4. **Do not try to remove the IUD yourself.** Do not let your partner pull on the strings. The clinician will have a better idea of the angle at which the IUD went in. It should come out the same way.

5. **Learn and pay attention to the IUD Warning Signs.**

Early IUD Warning Signs

Caution

- P** ■ Period late (pregnancy) or abnormal spotting or bleeding
 - A** ■ Abdominal pain, pain with intercourse
 - I** ■ Infection exposure (any STD), abnormal discharge
 - N** ■ Not feeling well with fever and chills
 - S** ■ String missing, shorter, or longer than usual
-

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Condoms

A 24-year-old man who had sexual intercourse with several women was worried about sexually transmitted infection. Although the doctor found him to be free of any sexually transmitted infection, he learned how uncomfortable the anxiety of unprotected sex could be. For two years he used condoms and reduced his number of sexual partners.

When the young man married, his wife was an 18-year-old woman who had never had intercourse. Because he felt familiar with condoms, the couple began their married life using them for contraception. Although they remain mutually monogamous, the husband and wife continue using condoms because they learned that condom use can be a positive experience and that condoms are effective, easy to use, safe to use, and convenient.

Condoms are a safe, easy, and effective method of preventing pregnancy and the most effective means other than abstinence of preventing sexual transmission of the human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs). Next to withdrawal, condoms are the only readily reversible method of birth control for men. In this chapter, condom refers to the male condom, a sheath that covers the penis. The female condom, discussed in Chapter 17 on Vaginal Barriers and Spermicides, is a pouch that lines the vagina.

Condom use has become increasingly important in preventing HIV infection. In Africa, most HIV infections are transmitted by sexual contact between a man and a woman.¹⁶ Because most infected persons have no symptoms for several years, they are unaware of their infection. Condoms can be used for protection during intercourse with an HIV-infected person or with a person whose HIV status is unknown. Although rates of condom use have been low in many areas of Africa, particularly within sub-Saharan Africa,^{5,9} more people are beginning to use condoms because of HIV education and prevention programs, campaigns promoting positive images of condoms, and more widespread distribution and availability of condoms.

OVERCOMING BARRIERS

Client counseling and education is important for promoting the use of condoms. First, assess the client's level of knowledge and familiarity with condoms. Can the client get condoms easily? Is the couple willing to use them? The list of barriers to condom use may be extensive, and complicated, particularly in areas where condom use is very low, and they may be personal or socioeconomic. For example, condoms may be difficult to get because sources, such as drug store dispensaries or family planning clinics, are not convenient. The price of condoms could be too high for the client. Some couples may falsely believe that condoms cause major side effects and are, therefore, unsafe to use. Others may believe that condoms contribute to impotence (the loss of erection). Second, show clients the correct method of applying the condom on a model of a penis and encourage the client to try this also. (See the section on "Instructions for Using Condoms.")

In some societies, the use of condoms may be associated with promiscuous sexual behavior or involvement with prostitution. Today, however, many sexually active couples use condoms simply for effective pregnancy protection. Of course, using condoms to protect against infection is a responsible and necessary act. Table 16:1 lists examples of myths and rumors often associated with condoms and the corresponding facts.

Table 16:1 Myths and facts about condom use

Myth or Rumor	Fact
Condoms decrease sexual enjoyment for couples	Some men say they have decreased enjoyment when using condoms. However, many couples enjoy sexual relations more when using condoms because they avoid the fear of unplanned pregnancy, and infection. Condoms also make erections last longer for some men.
Only prostitutes and promiscuous persons use condoms	All around the world, couples use condoms to prevent pregnancy. Any sexually active couple may choose condoms for family planning or to prevent infection. <i>It should not be assumed that someone who uses a condom has a sexually transmitted infection.</i>
Condoms make men impotent	Condoms may actually prolong intercourse for the couple and prevent premature ejaculation. Condoms do not cause impotence.
Condoms are unsafe for the human body.	Condoms very, very rarely cause medical side effects in users.
Condoms show that a man does not really trust his partner.	By using condoms, a man shows his partner that he cares about her health and welfare.
Condoms show that a woman does not really trust her partner.	Using condoms shows that a woman cares about the health and welfare of the man, herself, and any infant's that could be conceived. Using condoms shows that a woman <i>trusts</i> her partner not to take liberties with other women just because he uses condoms.
The condom might get lost inside the woman.	The condom very rarely falls completely off the penis during intercourse. If it does, the condom can be easily removed from the vagina.
Condoms do not work.	Condoms are very effective in preventing pregnancy and infections. <i>They must be used every time.</i>

MECHANISM OF ACTION

The condom is a sheath that fits over the penis. The condom prevents pregnancy by blocking the man's sperm from reaching an egg that has been released from the woman's ovary. For the condom to effectively prevent pregnancy, it must be used from "start to finish" with *every* act of intercourse. Most condoms are made from rubber and are called "latex" or "rubber" condoms, but some of the newer condoms being developed are made of plastic. A small percentage of condoms are made from the intestine of lambs and are known as "skin" condoms. Although all condoms can prevent pregnancy, only latex or plastic condoms are recommended if the couple desires protection from infection.

Condoms are available in varying sizes, shapes, colors, thicknesses, with or without lubricants or spermicides, and with or without reservoir tips or nipple ends. Some condoms are covered with a lubricant to make entry of the penis into the vagina easier. This lubrication may decrease the chance of breakage.

Condoms known to be available in Africa

<i>Atlas</i>	<i>Hygex</i>
<i>Blue-Gold</i>	<i>Lord Hygex</i>
<i>Conform</i>	<i>Panther</i>
<i>Conture</i>	<i>Prine</i>
<i>Crepe de Chine</i>	<i>Prudence</i>
<i>Durapac</i>	<i>R3 Aktiv-feucht</i>
<i>Durex</i>	<i>R3 Excellent</i>
<i>Durex Black Shadow</i>	<i>R3 Med</i>
<i>Durex Featherlite</i>	<i>R3 Naturcontact</i>
<i>Durex Fiesta</i>	<i>R3 Plus</i>
<i>Durex Gossamer</i>	<i>R3 Superfeucht</i>
<i>Durex Nu-form</i>	<i>Rosetex</i>
<i>Durex Supertrans</i>	<i>Sagami Wet</i>
<i>Elarco Minors</i>	<i>Samoa</i>
<i>Gallant Special</i>	<i>Silkies</i>
<i>Gold Circle</i>	<i>Sultan</i>
<i>Gold Coin</i>	<i>Tahiti</i>
<i>Goldtex</i>	<i>Trojan-Enz</i>

EFFECTIVENESS

PREGNANCY RATE

Condoms can be very effective in preventing pregnancy when used consistently *and* correctly. The pregnancy rate for couples who use condoms every time they have intercourse and correctly follow the instructions each time is estimated to be 3% per year of use. This has been called the *method failure rate*. It is important to understand what the method failure rate represents. It does not mean that 3 of every 100 condoms used will lead to unintended pregnancy. What it does mean is that only 3 of 100 couples who use condoms the right way every time they have sex will experience an accidental pregnancy in the first year. If each couple had sex twice per week, the 100 couples would have had intercourse 10,400 times over the course of a year. Three pregnancies resulting from approximately 10,400 acts of intercourse is a remarkably low pregnancy rate per condom used (0.03%).

The low method pregnancy rate for condoms is due, in part, to their high quality. Laboratory tests are conducted on samples of condoms from each batch to assess physical characteristics such as strength and the presence of holes. If the sample condoms do not meet the minimum test requirements, the batch is discarded. They are not distributed to clients or providers. In Africa, all condoms that are donated by the U.S. Agency for International Development (USAID) have passed United States and international standards for condoms.

The rate of accidental pregnancy for couples who do not use condoms every time or who do not use them correctly each time has been called the *user failure rate*. This user failure rate is estimated to be 14%, more than four times as high as the method failure rate. Most pregnancies among condom users occur because the condom is not used by the couple *every* time they have intercourse.

Couples can further increase the condom's effectiveness against pregnancy by combining condom use with simultaneous use of a second contraceptive method such as pills, spermicide, foam, or vaginal suppository. If two methods are correctly used, the risk of pregnancy is dramatically reduced. (See Chapter 11 on Essentials of Contraception.)

BREAKAGE AND SLIPPAGE

Although users often fear that the condom will break or fall off during intercourse, studies show that these events rarely occur when condoms are used properly. Many studies conducted in economically developed countries have shown that the incidence of condom breakage and slippage during vaginal intercourse can be very low. Typical studies indicate that the rate of breakage for good quality condoms is less than 3 or 4 condoms per 100 condoms used, although rates as low as 1% to 2% have been reported in studies from Zambia, Ghana, and Mali.¹⁰

Not every condom break occurring during sex leads to pregnancy or infection. Results from one U.S. survey found only 1 pregnancy reported for every 23 condom breaks.⁶ Furthermore, not every condom break will result in HIV infection. The risk of HIV infection after a single exposure (e.g., after a condom break) to unprotected intercourse with an HIV-infected partner is estimated to be less than 1%.⁹

ADVANTAGES AND INDICATIONS

ADVANTAGES

Prevention of Sexually Transmitted Infections

Condoms are also very effective in preventing many STIs, including HIV infection,³ herpes simplex virus, chlamydia, cytomegalovirus, gonorrhea, ureaplasma infection, and hepatitis B virus.²

Three studies of couples in which one partner had HIV and the other did not have shown that condoms are most effective when used consistently and correctly with each act of intercourse.¹³⁻¹⁵ In one study, there was no seroconversion among the 124 couples who used condoms consistently, but 10% of partners seroconverted among the couples who did not use condoms consistently.¹⁴ In a similar study, the seroconversion rate was 2% among the consistent condom-using couples but 12% among the inconsistent users.¹⁵

Condoms can also be used during other sexual activities, such as oral sex and anal sex. Like vaginal sex, these types of sex can result in the spread of many STIs, including HIV.

Condoms for women's health

Four key points are essential for understanding the importance of condoms in sexually transmitted infection (STI) prevention:

- 1. Bacterial and viral STIs, such as gonorrhea and chlamydia, are typically more damaging to the reproductive tract of the woman than to the man.*
- 2. Infected men transmit bacterial lower genital tract infections (e.g., gonorrhea) to two out of three female sex partners. Infected women transmit these STIs to one out of three male sex partners.²*
- 3. Condoms help protect women from unplanned pregnancy, ectopic pregnancy, vaginitis (lower tract infection), pelvic inflammatory disease (upper tract infection), infections that can harm a fetus during pregnancy or delivery, tubal infertility, genital cancer, and HIV infection.*
- 4. It is a woman's right to insist on condom use. It is a woman's right to say no to intercourse if her partner says no to condoms.*

Other Advantages

Condoms may have desirable effects in addition to their benefits as a contraceptive:

- Help the man to maintain an erection and help prevent or treat premature ejaculation (the rim of the condom may have a slight tourniquet effect)⁴
- Provide immediate, visible proof of effectiveness because the ejaculate is contained within the condom

- Encourage male participation in contraception and securing protection from infection
- Provide a barrier for women and men who do not wish to have the penis or semen in direct contact with the vagina
- May be a more accessible method of contraception because an examination, prescription, or fitting is not required; in addition, condoms can be obtained by both men and women
- Are generally inexpensive and may often be obtained for free
- Provide an option, with virtually no side effects, for women who cannot use hormonal contraceptive methods

INDICATIONS

The condom may be extremely attractive to the following groups:

- Persons at risk of getting or passing STIs, including HIV (these persons include sexually active men and women who live in areas with high rates of STIs)
- Users of other contraceptive methods (e.g., hormones, vaginal methods, and sterilization) who may be at risk for HIV or other STIs
- Couples who wish to avoid an unplanned pregnancy
- Clients who are beginning use of other contraceptive methods (e.g., pills) and who have been encouraged to initially use a back-up method for additional contraceptive protection

DISADVANTAGES AND PRECAUTIONS

On the whole, condoms are associated with few disadvantages, and those usually have relatively minor impacts on health. They may:

1. Reduce feeling and sensitivity for the male, although no objective data have proven this is true (some men have suggested

that sensitivity can be increased by applying a thin layer of lubricant on the head of the penis before putting on the condom)

2. Interrupt sexual spontaneity because the condom must be put on before intercourse (having the woman put the condom on the man may help to overcome this problem)
3. Rarely cause allergic reactions (to latex)
4. Embarrass either partner to suggest or initiate condom use, or to obtain condoms
5. Occasionally slip off or break during intercourse
6. Deteriorate if stored in too much heat, sunlight, or humidity
7. Occasionally result in the man being unable to maintain an erection; counseling may help to overcome this problem

PROVIDING CONDOMS

Condoms are used around the world by married couples. Using condoms does not mean a person is promiscuous or involved in prostitution.

The most important message to convey is that the condom must be used from “start to finish” with *every* act of intercourse to effectively prevent pregnancy and STIs. Do not assume that the client knows how to correctly use a condom, regardless of the client's past condom experience. The client may be using them incorrectly each time, which can lead to pregnancy or infection. It is important that providers and clients completely understand the instructions on how to use a condom that are presented at the end of this chapter. Several mistakes commonly made by condom users include the following:

- Not having a condom available when needed
- Starting intercourse without a condom on the penis, then interrupting intercourse to put on the condom (or deciding not to use the condom at all)
- Tearing the condom with a fingernail

- Not holding the rim of the condom when withdrawing the penis from the vagina, causing condom slippage and leakage
- Forgetting to use the condom altogether

When possible, provide clients with enough condoms so that they will not need to visit the clinic frequently to get more condoms. The supply of condoms given to the client should be based on his/her needs. (A 3-month supply is typically 25 to 50 condoms.) Family planning providers should know the following:

- Condoms may be obtained free of cost from many public family planning programs, government dispensaries, and depot holders. It is important to provide several months' supply of condoms to clients to encourage their ongoing use, particularly if they are difficult for the client to obtain.
- Generally, condoms must be supplied to clients at each clinic visit.
- Good-quality condoms will likely promote good condom use. In very hot or humid climates, it may be necessary to improve storage areas to maintain the condom's integrity.
- Condoms can be carried without damaging them for a month or so in purses or wallets. Carrying condoms does not indicate that a person is planning to engage in sexual intercourse.

DISTRIBUTION

Innovative programs have been shown to dramatically increase the use of condoms, particularly when men believe that other men in their community are also using condoms.⁹

Social marketing of condoms for HIV prevention has been implemented in many African countries, including Benin, Burundi, Cameroon, Ethiopia, Liberia, Nigeria, Sierra Leone, Tanzania, Uganda, Zaire, Zambia, and Zimbabwe, to make condoms more available in areas with high HIV prevalence.⁹

One important feature of successful public sector condom distribution programs is the provision of a large number of condoms to each client. Providing only a few condoms to a client is a very short-term solution, particularly for clients who find it difficult to get to health care facilities or who find it embarrassing to return repeatedly for condoms. In the private sector, where commercial retail sales through "drug stores" are a major source of condoms, cost may be a constraint to continued condom use for some clients. However, condoms can be obtained freely or cheaply from many sources.

Tens of millions of condoms have been dispensed in some African countries. Among the most creative marketing or public awareness efforts of condom distribution have been the following:

- In Kigali, Rwanda, an HIV counseling and testing program offered free condoms and spermicide and showed a videotape about the acquired immunodeficiency syndrome (AIDS) to clients. This led to increased rates of condom use among women, where one year into the program, 22% of women were using condoms, when only 7% had tried them before the program.¹
- In Uganda, a USAID program called "AIDS in the Workplace" taught facts about HIV transmission at worksites and distributed more than 600,000 condoms since its inception.¹²
- In Zaire, condoms are extensively advertised and promoted through television, radio, and posters for family planning and the prevention of AIDS by the *Projet de Marketing Social*.⁹
- In Kenya, more than 100,000 condoms have been distributed through a program that places condom vending machines in worksite locations.⁹

INSTRUCTIONS FOR USING CONDOMS

When you have sexual intercourse, the condom provides a barrier between the penis and the vagina. The most important instruction for using condoms is that a new condom must be used from “start to finish” *every* time you have intercourse.

1. Use latex or plastic, not skin, condoms if you want protection from HIV infection and STIs.
2. Put the condom on the erect penis (either partner can do this) *before* the penis is inserted into the vagina.
3. Unroll the condom down to the base of the penis. (See Figure 16:1.) If you find that the condom will not unroll because it is inside out, do not flip it over. Turning it over may expose your partner to germs and sperm. Discard the condom and start with a new one.
4. Make sure that the vagina is well lubricated before penetration. A condom may be more likely to tear if the vagina is dry. If extra lubrication is needed, use water, a water-based jelly, or contraceptive foam, gel, or cream. Do not use petroleum-based products with latex condoms; they can weaken the condom and make it more likely to break during use.
5. After intercourse, as the penis is pulled from the vagina, hold the rim of the condom against the base of the penis to prevent spilling any sperm. The penis should be removed from the vagina soon after ejaculation—if the erection is lost, the condom can slip off and pregnancy or infection can result.
6. After the penis has been removed from the woman and is clearly away from the vagina, slowly slide the condom off the penis without spilling semen. Discard the condom.
7. If the condom breaks, falls off, leaks, or is not used, immediately put spermicidal foam, gel, or a suppository into the vagina (if spermicide is available and you have not already done so). If spermicide is not available, quickly wash both the penis and vagina with soap and water to lower the risk of

fertilization or infection. See your health care worker as soon as possible; you may be able to get emergency contraceptive (postcoital) pills if you do not already have them on hand.

8. Store condoms in a cool, dry place away from direct sunlight. Heat may cause the rubber to weaken, so don't store condoms in a place that becomes very hot. If the condoms are kept dry, sealed, and away from heat, sunlight, humidity, and fluorescent light, they will generally last at least 3 years. The date printed on the package of the condom is generally the date of manufacture, unless it is marked "exp", which indicates the expiration date.

Figure 16:1 The condom is rolled down the erect penis



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Vaginal Barriers and Spermicides

She had heard stories of her grandmother and her grandmother's mother. They had placed objects in their vaginas to prevent pregnancy—it was one of the very few methods they had. She was not certain how well her grandmother's barriers and chemicals worked, but she could understand how the modern-day diaphragm and spermicides could help her space her pregnancies. Her husband also liked the idea of a natural method, the type handed down through generations. Because she and her husband felt comfortable with diaphragms and spermicides, they were enthusiastic about using these methods correctly and consistently.

Since ancient times, women have placed objects in their vaginas to prevent pregnancy. Today, women have a number of options: barriers such as the diaphragm, the cervical cap, the contraceptive sponge, and the female condom; and spermicides such as those found in foams, creams, gels, and films.

OVERCOMING OBSTACLES TO USE OF BARRIER METHODS

Historically, the use of vaginal barrier methods has been limited in Africa. Few clinical providers have been available with training and

experience to fit vaginal devices and provide client instruction. Many providers also appear to hold undue bias against the use of vaginal barriers. Practical obstacles, such as device and spermicide cost, and the necessity for cleaning and sterilizing devices used for fitting also may play a role. Client reluctance to use a method that requires touching the genital area is often raised as a concern. However, the success of research trials in Africa evaluating other vaginal devices (such as vaginal rings), and widespread cultural practices such as douching and use of vaginal products like drying agents in conjunction with intercourse suggest that this concern may not accurately reflect client issues.

The future role of spermicides and vaginal barrier methods will depend on research about their ability to prevent sexually transmitted infections (STIs) and their record of producing irritation. If researchers document reduced infection risk with female condoms, and they find a dose and frequency for spermicide use that does not adversely effect the risk of transmitting the human immunodeficiency virus (HIV), these methods will deserve a much wider role in Africa.

MECHANISM OF ACTION

Spermicide products have two components: a chemical that kills sperm and a base or carrier (foam, cream, jelly, film, suppository, or tablet). Spermicidal chemicals in products that are available in various parts of Africa include nonoxynol-9, octoxynol, menfegol, and benzalkonium chloride. These are detergents that kill sperm by disrupting the sperm cell membrane.

Vaginal barriers, except for the female condom, combine two contraceptive mechanisms: a physical barrier to shield the cervix and a spermicide. The presence of a cap or diaphragm device may help to hold spermicide in place against the cervix. The female condom provides a physical barrier that lines the vagina entirely and partially shields the perineum.

EFFECTIVENESS

Reported pregnancy rates for typical users range from 0% to more than 50%. Unfortunately, because clinical trials of spermicide used alone do not meet modern standards for study design and analysis, comparisons of efficacy between spermicides and other methods, or between one spermicide preparation and another, is not truly meaningful using reported rates. The pregnancy rate for typical use (26%) is based on population survey information for spermicide users in the United States; the rate for perfect use (6%) is an estimate based on rates reported and rates found for similar methods.

The diaphragm, female condom, and cervical cap provide comparable contraceptive efficacy for women who have never been pregnant (6-9% with perfect use, 20% with typical use).¹⁰ For women who have been pregnant, the cap is much less effective than the diaphragm or female condom. Among these women, the typical use pregnancy rate for cervical cap use (40%) is double that for the diaphragm. The perfect use pregnancy rate for the cap among parous women is 26%.

Correct placement and timing are important for all these methods, especially for the spermicides. The spermicide applicator, tablet, suppository, or film needs to reach the cervix, which for most women is deep in the vagina. Suppositories, foaming tablets, and films require adequate time for dissolution and dispersion.

Most studies indicate that about half the women who become pregnant do not use their vaginal barrier correctly. *The other half of reported pregnancies, however, occur despite correct use.* Thus it is misleading to teach clients that improper use entirely explains method failure. Women who are young and have frequent intercourse are at a higher risk for pregnancy and are also more likely than average women to become pregnant while using a spermicide or a vaginal barrier method.

HIGH EFFICACY WITH USE OF TWO METHODS

Using two methods simultaneously, such as male condoms along with spermicide, greatly reduces the risk of pregnancy (see Table 17:1). The chance that both methods might fail at the same time is very low. This principle also applies to simultaneous use of a vaginal barrier method along with oral contraceptives or to any combination of methods except simultaneous use of male and female condoms. That combination is not recommended because male and female condoms might stick to each other and cause one or both to dislodge from their correct positions. Alternatively, a couple could use two methods simultaneously during the most fertile week in each cycle (beginning 4 days before ovulation) and a single method at other times.

Table 17:1 Perfect, simultaneous use of spermicide and condoms

Method	Contraceptive failure within 1 year (%)
Condoms used alone	3
Spermicide used alone	6
Spermicide and condom used together	0.02

Source: Kestelman and Trussell (1991)

THE CLINICIAN'S ROLE

The clinician can play an important role in helping women decide wisely about these methods and use them successfully:

1. Discuss any characteristics that indicate higher than average pregnancy risk, such as:³²
 - Frequent intercourse (3 or more times weekly)
 - Age less than 30 years
 - Lifestyle or home situation that makes consistent use of contraceptives difficult

- Previous contraceptive failure (any method)
 - Uncertainty about the decision to avoid pregnancy
 - Desire to delay (rather than prevent) next pregnancy
2. Talk about possible risk factors for exposure to STIs. If her risk is high, abstinence is the safest option. Encourage use of latex male condoms as an alternative or in addition to a diaphragm or cervical cap. (Female condoms should not be used simultaneously with male condoms.)
 3. Explain the high efficacy of using two methods simultaneously (see Table 17:1).
 4. Be sure that every woman is aware that her interval of highest fertility begins about 4 days *before* ovulation.
 5. Be sure every woman knows about emergency contraception options for postcoital treatment (see Chapter 13 on Oral Contraceptives) and has a supply on hand.

Help the woman choose which of the available spermicide or barrier options is most likely to meet her needs. These methods differ in characteristics and in rules for their use (see Table 17:2). Such differences may make a particular option easier or more appealing for a specific woman. If the match between the method and the woman's personal needs and sexual patterns is comfortable, she may be more likely to use it consistently and correctly. For example, the diaphragm method may be cumbersome for a woman whose life involves sexual intimacy primarily on weekends. The need for extra spermicide with repeated intercourse and the 24-hour maximum wearing time may be bothersome requirements. A cap that can be left in place with no additional spermicide may be easier to use correctly. Similarly, washing and storing a cap or diaphragm and the need to have a tube of spermicide available may be obstacles for a woman who is not at her own home or does not have access to privacy for washing or storage. The contraceptive sponge is easy to use but has not had a consistent production schedule and may not always be available.

Table 17:2 Vaginal barrier methods — instructions for use

	Diaphragm	Cap
Pelvic exam required for fitting	Yes	Yes
Spermicide needed with insertion	Yes	Yes
Additional spermicide needed for repeated intercourse	Yes	No
Supplies needed to add spermicide after initial insertion	Yes	No
Container needed for storage after use	Yes	Yes
Can be used during menses	No	No
Duration of protection after insertion	6 hours	48 hours
Longest wear allowed	24 hours	48 hours

ADVANTAGES AND INDICATIONS

Spermicides and vaginal barrier methods have many advantages that make them reasonable for both temporary and long-term contraception. Spermicides and female condoms can be purchased without a visit to the clinician, and a woman can take full responsibility for their use. Spermicides can be used without any help or cooperation. These methods are a good back-up for women who are just beginning another method, do not have their other method with them, or want extra protection. Spermicides can be used as an emergency measure if a condom breaks. An application of spermicide should be quickly inserted in this instance. Spermicides can be used to provide lubrication during intercourse and can appropriately be used for lubrication with a condom. A vaginal barrier can be available for immediate protection whenever needed, no matter how long the interval between uses.

There are very few medical problems that might make use of spermicides or vaginal barriers unwise. Vaginal barriers do not cause systemic side effects and do not alter a woman's hormone patterns. For women who are not at risk for STIs, particularly HIV, and who have access to safe abortion in case of failure, the medical safety of spermicides and vaginal barrier methods is comparable to that of male condoms.

SPERMICIDES AND RISK OF STIS

Laboratory research shows that nonoxynol-9 is lethal to the organisms that cause gonorrhea, genital herpes, trichomoniasis, syphilis, and acquired immunodeficiency syndrome (AIDS).^{1,11,22,36} Other spermicidal chemicals, such as octoxynol, benzalkonium chloride, and menfegol, have similar chemical properties and are also effective against these pathogens in the laboratory.³⁶ Good results in a laboratory test tube, however, do not mean that spermicide products can provide reliable protection in actual use. Even when used correctly, a vaginal product might fail to protect. For example, a spermicide might not completely spread through the vagina. Also, using spermicide causes changes in the normal bacteria of the vagina and in the normal acid balance of vaginal fluids,²⁷ both of which could interfere with a woman's natural defenses against infection. Research indicates that such changes actually do increase risk for urinary tract infection (see Disadvantages and Precautions, below). Spermicide chemicals also can cause vaginal irritation, which could increase the user's susceptibility to infection. Although most of the studies in this area have addressed nonoxynol-9, similar results should be expected with the other spermicidal agents currently available.³⁶

PROTECTION AGAINST COMMON STIS

Spermicides and vaginal barriers appear to have some efficacy against common bacterial STIs such as gonorrhea and chlamydia.

Many studies show that women who use these methods have a slightly reduced risk for chlamydia and gonorrhea infection.^{4,29,41} Methods that combine a physical barrier, such as the diaphragm or male condom, with a spermicide appear to provide the best protection.⁵ Research has also confirmed lower risks for pelvic inflammatory disease (PID) and tubal infertility for diaphragm users^{7,19} as well as a lower risk for cervical cancer.^{6,24,25,39} Because infection with certain types of human papillomavirus (HPV) is linked to the most common form of cervical cancer, the diaphragm may help reduce cervical cancer risk by lowering the chance of HPV infection.

The female condom, too, may help reduce the risk of STIs. When used correctly, the female condom shields both the woman and the man, and traps semen inside the condom. The female condom is made of polyurethane, which is impermeable to bacteria and viruses. Protection against the spread of trichomonas infection has been reported for the female condom,³⁵ but studies to document reduced risk for other STIs are not yet available.

STUDIES OF IRRITATION AND HIV OR AIDS RISK

Human studies of HIV or AIDS risk in relation to spermicide use are very limited, and results have been contradictory. The first study of HIV seroconversion rates and possible spermicide effects involved 138 sex workers in Nairobi; contraceptive sponges containing 1,000 mg of nonoxynol-9 were compared with a placebo vaginal cream that contained no spermicide. Use of spermicide sponges did not lower the risk of HIV seroconversion, and women using the spermicide sponges had more frequent genital irritation and ulceration than the placebo users.²² This result is of great concern because diseases involving ulcers may contribute to HIV susceptibility.⁴⁰ Women in this study, however, had very frequent intercourse, using 14 sponges per week on average. Thus their total exposure (dose and frequency) to spermicide was very high.

Two other small studies of HIV infection rates are more encouraging. One, which involved a group of sex workers in Cameroon,^{36,43}

found that use of nonoxynol-9 suppositories was associated with reduced incidence of HIV infection; the other reported a similar benefit for Zambian women with HIV-positive partners.¹²

Several researchers have confirmed that spermicide produced irritation even when women did not have intercourse and have begun to clarify the relationship between frequency of use, dose, and irritation effects.^{9,11,42} In a study that provided careful examination, including colposcopy, irritation effects were documented after daily (or more frequent) use of suppositories containing 150 mg of nonoxynol. The 35 women who used spermicide suppositories every other day in this study, however, had colposcopy results indistinguishable from placebo users.²⁸

It may be that spermicide use is beneficial when the frequency and dose are moderate but not when the dose is high or use is very frequent. Further research is needed to provide assurance that spermicide use is not harmful and to better define an optimal dose range and frequency of use.

DISADVANTAGES AND CAUTIONS

DISADVANTAGES

Common Minor Problems

Skin irritation is the most common problem associated with spermicides and vaginal barriers that involve the use of spermicide. Some women have cramps, bladder pain, or rectal pain when wearing a diaphragm or cap, and men occasionally report penile pain during intercourse. For diaphragm users, a different size or rim type may resolve these problems.

Foul odor and vaginal discharge are likely to occur if a diaphragm or cap is inadvertently left in the vagina for more than a few days. These symptoms disappear after the device is removed. Rare cases of vaginal trauma, including abrasion and laceration, have been reported with use of the Prentif cap and the diaphragm.³

Vaginal and Urinary Tract Infections

Sexual intercourse is followed by increased vaginal colonization with *Escherichia coli*. Compared with oral contraceptive users, women who use spermicide alone or in combination with condoms have a prolonged shift in normal vaginal bacteria; among diaphragm users the shift is even more prolonged.^{16,30} This finding is of concern because bacterial vaginosis may be associated with increased risk for upper genital tract infection,⁴ and because it may account for the increased risk of urinary tract infection (UTI) observed among women who use the diaphragm or condoms with spermicide.¹⁴ The pressure a diaphragm rim places on the urethra also may contribute to the risk of developing UTI for some women.

Women who have used sponges containing nonoxynol-9 spermicide have reported an increased incidence of symptomatic candidiasis (yeast).^{22,30} Increased vaginal colonization with *Candida* species has been documented after using a diaphragm with spermicide.¹⁵ *Candida* is much more resistant to the microbicidal effects of nonoxynol-9 than are other normal, desirable vaginal organisms such as *Lactobacillus*.²¹

Toxic Shock Syndrome

Toxic shock syndrome (TSS) is an extremely rare but serious disorder caused by toxin(s) released by some strains of *Staphylococcus aureus* bacteria. Patients using vaginal barriers need to be aware of the TSS danger signs, and instructions for using the particular method should be consistent with recommended TSS precautions.³³

Systemic Effects

Serious adverse reactions have not been reported for nonoxynol-9 and octoxynol. In animal studies, large doses of nonoxynol-9 have been associated with liver toxicity and embryotoxic effects.² Three studies in humans reported possible adverse associations between spermicide exposure and birth defects,^{17,18,31} but these studies appear to have had serious methodologic problems. Subsequent research has not found adverse fetal effects associated with spermicide use.^{8,13,34,37} Thus, experts believe no true association exists between spermicide use and fetal defects.^{8,13,34}

Precautions

The following conditions may make vaginal barrier methods inadvisable:

1. Allergy to spermicide, rubber, latex, or polyurethane or irritation symptoms related to use of the method
2. Abnormalities in vaginal anatomy that interfere with satisfactory fit or stable placement
4. History of toxic shock syndrome
5. For the diaphragm, repeated urinary tract infections that persist despite efforts to refit the diaphragm
6. For the diaphragm and cap, lack of trained personnel to fit the device and provide instruction
7. For the cap, full-term delivery within the past 6 weeks or recent spontaneous or induced abortion (caps should not be used during vaginal bleeding from any cause, including menstrual flow)
8. For the cap, known or suspected cervical or uterine malignancy, an abnormal Papanicolaou (Pap) smear result, or vaginal or cervical infection
9. For spermicides, caution in using these agents is indicated for a woman who is at high risk for STIs and HIV infection, or who would need to use the method very frequently (more than every other day)

PROVIDING VAGINAL BARRIER METHODS AND SPERMICIDES

SPERMICIDES

When providing spermicides in a clinical setting, reinforce instructions for proper use and remind the user about common errors that can lead to unintended pregnancy.

Foam

Foam is marketed to be used alone, but it can be used satisfactorily with a diaphragm or with a condom.

Creams and gels

Creams and gels are commonly marketed for use with a diaphragm, but they also can be used alone. One application of foam, cream, or gel provides 80 to 150 mg of spermicide, depending on the product. Spermicide concentration is 12.5% in foam and ranges from 1% to 5% in gels and creams.

Suppositories and foaming tablets

Spermicide suppositories are intended for use alone or with a condom. Suppositories provide 100 to 150 mg in a 2.3% to 8.3% concentration. Allow enough time between insertion and intercourse (10 to 15 minutes depending on the product) for the suppository to melt or foam up.

Film

Vaginal contraceptive film can be used alone or with a diaphragm or condom. Each 2" x 2" paper-thin sheet of film is 28% spermicide and contains 72 mg of nonoxynol-9. The sheet must be inserted on or near the cervix (or inside the diaphragm) at least 5 minutes before intercourse to allow time for the sheet to melt and spermicide to disperse. Placing film on the tip of the penis for insertion is not recommended as a way to use this method because the film will not have adequate time to dissolve and because the film may not reach its proper position.

VAGINAL BARRIERS

Make sure the woman can insert and remove her device correctly. Stress the importance of consistent, correct use, and explain how to

use spermicide, if it should be used with her barrier. Be sure the woman understands when to remove her barrier. A female condom should be removed immediately after intercourse; the condom should be twisted during removal to trap semen inside. A diaphragm or cervical cap, on the other hand, must be left in place for at least 6 hours after intercourse. Remind diaphragm and cap users about TSS danger signs (see Instructions for Patients in the following section).

Female condom

The female condom is a thin (0.05 mm) polyurethane sheath, 7.8 cm in diameter and 17 cm long. This soft, loose-fitting sheath contains two flexible polyurethane rings. One ring lies inside the vagina and serves as an insertion mechanism and internal anchor. The other ring forms the open edge of the device and remains outside the vagina after insertion (see Figure 17:1). The external portion of the device covers part of the perineum. Intended for one-time use, the device should not be used in conjunction with a latex male condom.

The female condom provides protection for one act of intercourse. It can be inserted any time (up to 8 hours) before intercourse and must be removed immediately after intercourse.

Diaphragm

This dome-shaped rubber cup has a flexible rim; it is inserted into the vagina before intercourse so that the back rim rests in the posterior fornix and the front rim fits snugly behind the pubic bone. The dome of the diaphragm covers the cervix. Spermicidal cream or jelly is placed inside the dome prior to insertion.

Once in position, the diaphragm provides effective contraceptive protection for 6 hours. If a longer interval has elapsed before intercourse, inserting additional, fresh spermicide with an applicator (without removing the diaphragm) is recommended. An additional applicator-full of spermicide is recommended whenever intercourse is repeated. After intercourse, the diaphragm must be left in place for at least 6 hours. Wearing it for longer than 24 hours is not recommended because of the possibility of TSS.

Figure 17:1 Reality female condom



Diaphragms are available in sizes ranging from 50 to 95 (diameter in mm) and in several styles (see Figure 17:2). The very sturdy *arcing spring rim* has firm spring strength. Most women can use this style comfortably. The arcing spring rim can often be used successfully even if a woman has a rectocele, cystocele, or lax vaginal muscle tone. The thin *flat spring rim* has a gentle spring strength that is comfortable for women with very firm vaginal muscle tone. The sturdy *coil spring rim* has a firm spring strength suitable for a woman with average muscle tone and an average pubic arch depth. A plastic diaphragm introducer (see Figure 17:3) can be used with coil or flat spring styles, but not the arcing spring rim. The *wide-seal rim* has a flexible flange approximately 1.5 cm wide attached to the inner edge of its rim. The flange is intended to hold spermicide in place inside the diaphragm and to create a better seal between the diaphragm and the vaginal wall. Wide-seal diaphragms are available with either an arcing spring rim or a coil spring rim.

Figure 17:2 Types of diaphragms

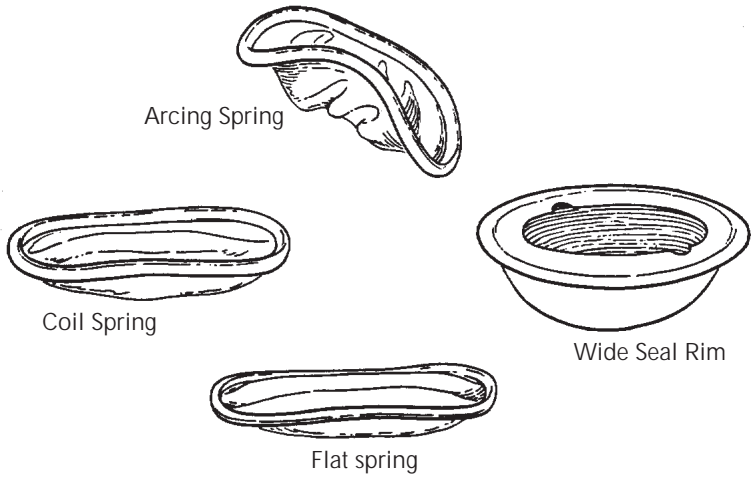
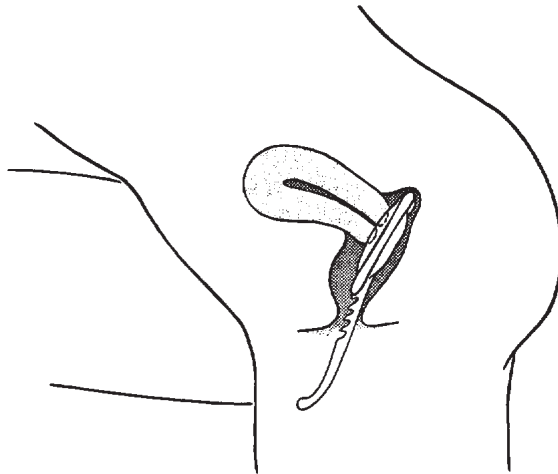


Figure 17:3 Some women prefer to use a plastic introducer for diaphragm insertion



Fitting a Diaphragm. Diaphragm manufacturers produce sets of fitting rings that are sample diaphragm rims with no dome. However, fitting rings are not adequate for patient practice. Whole diaphragms should be used for fitting so that the patient can practice insertion and removal with the sample diaphragm. To estimate the diaphragm size that will be needed:

1. Insert your index and middle fingers into the vagina until your middle finger reaches the posterior wall of the vagina.
2. Use the tip of your thumb to mark the point at which your index finger touches the pubic bone.
3. Extract your fingers.
4. Place the diaphragm rim on the tip of your middle finger. The opposite rim should lie just in front of your thumb.

Insert a sample diaphragm of the size you have selected into correct position in the patient's vagina. The device should rest snugly in the vagina, its rim in contact with the lateral walls and posterior fornix, but without tension against the vaginal walls. There should be just enough space to insert one finger tip comfortably between the inside of the pubic arch and the anterior edge of the diaphragm rim.

Choose the largest rim size that is comfortable for the patient. Try more than one rim size or type before making a final selection. Do not choose a size that is too small, because vaginal depth increases during sexual arousal (3 to 5 cm in nulliparous women), and a diaphragm that is too small may slip off the cervix. A diaphragm that is too large may create vaginal pressure, abdominal pain or cramping, vaginal ulceration, or recurrent UTIs.

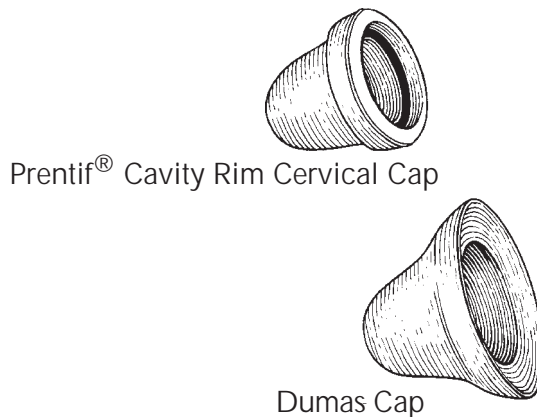
Disinfecting Diaphragm Fitting Samples. After each fitting, always wash and disinfect the sample devices:

- Wash with soap and water, and then autolave at 121 degrees Centigrade, 15 pounds per square inch (psi) for 20 minutes unwrapped or 30 minutes wrapped; or soak in a solution of one part chlorine bleach to nine parts water for 30 minutes, rinse with water, then soak in alcohol solution (70% isopropanol or 80% ethanol) for 15 minutes after each use.²³

Cervical Cap

The cervical cap is a deep, soft rubber cup with a firm, round rim (see Figure 17:4). The Prentif cap has a groove along the inner circumference of the rim intended to improve the seal between the inner rim of the cap and the surface of the cervix. One-third of the cap's dome should be filled with spermicide before the cap is inserted; the spermicide is held in place against the cervix until the cap is removed.

Figure 17:4 Two cervical caps



The cap provides continuous protection for 48 hours, no matter how many times intercourse occurs. Additional spermicide is not necessary for repeated intercourse. Because of the possibility of developing TSS, wearing a cap for longer than 48 hours is not recommended. Some women experience odor problems with prolonged use.

Fitting a Cervical Cap. Because of variations in normal anatomy and the limited number of cap sizes available, it will not be possible to fit every patient properly. When a Prentif cap is fitted correctly, the inner diameter of the cap rim must be almost identical to, or just a few millimeters larger than, the base of the cervix. The rim forms a seal with the cervical surface. The Prentif cap rim should rest at the base of the

cervix so that the vaginal walls surround the outer side of the rim. A Dumas cap rim should rest snugly in the vaginal fornices, close to the base of the cervix. With either cap, the cervix should be completely covered. The dome of the cap should be deep enough so that it does not rest on the cervical os.

A Prentif cap that is too tight can cause cervical trauma, and one that is too loose or fails to make a secure seal over the entire circumference of the cervix will be more likely to dislodge. A woman whose uterus is acutely anteflexed, so that her cervical portio faces downward toward the back of her vagina, may find that her cap (Prentif or Dumas) dislodges. To fit a cap:

1. Perform a bimanual exam to determine the position and size of the uterus and cervix.
2. Inspect the woman's cervix to estimate the proper cap size. For a Prentif cap, the cervix must be fairly symmetrical and without extensive laceration or scarring that could interfere with uniform contact between the cap rim and cervix around its full diameter. The cervix must also be long enough to accommodate the height of the cap. A cervix that is flush or partially flush with the vaginal vault cannot be fit with a Prentif cap. In this situation, however, a Dumas cap may fit properly.
3. To insert the cap, fold the rim and compress the cap dome so that when it is released in place over the cervix, the unfolding dome can create suction.
4. Check the fit with one finger around the rim of the cap. For the Prentif cap, be sure there are no gaps between the cap rim and the cervix. Check to see how easily the cap can be dislodged.

5. Check for evidence of suction after the cap has been in place for a minute or two. Pinch the cap dome and tug gently. The dome should remain collapsed, and the cap should resist the tug and not slide easily out of position.
6. Try to rotate the cap in place. If it does not rotate at all, it is too tight; if it rotates too easily or comes off the cervix, it is too large.
7. To remove the cap, probe the rim with the end of your index finger; tip the cap rim to break the seal, then gently pull the cap down and out.
8. Try two or more cap sizes to determine the fit.

New cap users should try the cap initially while still using another method of birth control, such as condoms or oral contraceptives, to be sure that the cap remains in position after intercourse.

Disinfecting Cap Fitting Samples After each fitting, always wash and disinfect device(s):

- Wash with soap and water, and then autoclave at 121 degrees Centigrade, 15 pounds per square inch (psi) for 20 minutes unwrapped or 30 minutes wrapped; or soak in a solution of one part chlorine bleach to nine parts water for 30 minutes, rinse with water, then soak in alcohol solution (70% isopropanol or 80% ethanol) for 15 minutes after each use.²³

Contraceptive Sponge

The sponge is round, dimpled, and made of polyurethane. It contains one gram of nonoxynol-9. The sponge protects for up to 24 hours, no matter how many times intercourse occurs. After intercourse, the sponge is left in place for at least 6 hours. After one 24-hour period of use, the sponge must be discarded.

MANAGING PROBLEMS AND FOLLOW-UP

Women using spermicides or vaginal barrier methods do not need special follow up unless they experience difficulties using their method or have symptoms of irritation, UTI, or possible TSS. After pregnancy, users should have their diaphragms and caps refitted.

Watch for symptoms that may be related to use of spermicide and barrier methods. In many cases, the woman may not suspect that her medical problem could be related to the method:

- Recurrent vaginal irritation, with no evidence of vaginal infection, may indicate allergy or sensitivity to spermicide or to latex. Changing to a different spermicide product may resolve the problem, but if it does not, the woman should avoid further exposure. Special warning is indicated for any woman who develops irritation: because susceptibility to infection with HIV may be increased, it is essential to avoid any possible exposure to STIs.
- Recurrent UTI, recurrent yeast infection, or bacterial vaginosis may be associated with using a diaphragm. In some cases, providing a smaller diaphragm size, a different rim style, or a cervical cap resolves the UTI problem. If the woman continues to have infections, she should switch to another method of contraception that does not require use of spermicide.

A vaginal barrier user who develops signs or symptoms of TSS requires urgent, intensive evaluation and treatment. Treat the patient with antibiotics, and follow her carefully. If her symptoms are severe, she may need hospitalization. Since women who have had TSS have a greater risk than other women of getting it in the future, advise your patient to discontinue barrier methods.

No matter what other methods of contraception a woman is using, if she is at any risk because of her partner tests HIV positive or because she does not know her partner's HIV status, she should be advised to use plastic or latex condoms with every sexual act. No other contraceptive method besides abstinence provides the same degree of protection.

INSTRUCTIONS FOR BARRIER AND SPERMICIDE USERS

1. Use your contraceptive method every time you have intercourse. Be sure the barrier or spermicide you use is in place before beginning vaginal intercourse.
2. If you are using a diaphragm, sponge, or cap and have a high fever and one or more of the danger signs of toxic shock syndrome, remove the device immediately and contact your clinician.

Toxic Shock Syndrome Danger Signs

Caution

- Sudden high fever
- Vomiting, diarrhea
- Dizziness, faintness, weakness
- Sore throat, aching muscles and joints
- Rash (like a sunburn)

-
3. Wash your hands carefully with soap and water before inserting, checking, or removing your barrier or spermicide.
 4. If you have skin irritation or vaginal irritation, stop using your contraceptive method; abstain from intercourse or use an alternative method such as male condoms. If irritation resolves in a day or two, you can try a different spermicide; otherwise, see your clinician to be sure you don't have an infection.
 5. If you have repeated bladder or vaginal infections such as vaginal yeast, discuss this with your clinician.
 6. If you feel unsure about the proper fit or placement of your barrier, use male condoms and see your clinician.
 7. Do not douche right after intercourse. Douching is not recommended, but if you choose to do so, you must wait until at least 6 hours after intercourse, and after you have removed your device.

- For extra protection against pregnancy and infection, use condoms along with your diaphragm or cap.

BEFORE INTERCOURSE

- Be sure you have all the supplies you need. If you are using a diaphragm or cervical cap, you also need spermicidal cream or jelly. Check to be sure your cap or diaphragm has no holes, cracks, or tears.
- Plan ahead about when to insert your method. Follow the rules for using barriers and spermicides (see below):

USING BARRIERS AND SPERMICIDE

Method	When to insert	When to remove after intercourse	Number of acts of intercourse allowed
Spermicide	Allow time for product to dissolve or spread in vagina	Douching is not recommended, but if you douche, wait at least 6 hours after intercourse	1 act with each application
Female condom	Just before or up to 8 hours ahead	Immediately after	Only 1
Diaphragm	Just before or up to 6 hours ahead	6 hours after	Unlimited with additional spermicide
Cervical cap	At least 30 minutes before	<ul style="list-style-type: none"> • Leave in for 6 hrs. after intercourse • Remove after 48 hours of wear 	Unlimited
Contraceptive sponge	Any time before	<ul style="list-style-type: none"> • Leave in for 6 hrs. after intercourse • Remove after 24 hours of wear 	Unlimited

INSERTION

1. Wash your hands carefully with soap and water.
2. Follow the instructions below for inserting barriers and spermicides:

Method	Instructions for insertion
Foam	Shake the foam container at least 20 times, then use the nozzle to fill the plastic applicator. Insert the applicator deeply into your vagina, close to your cervix, then push the plunger.
Jelly or cream	Fill the applicator. Insert as for foam.
Suppository	Remove the wrapping and slide the suppository into your vagina. Push it along the back wall of your vagina until it rests on or near your cervix.
Film	Place one sheet of film on a <i>very dry</i> finger tip and slide it along the back wall of your vagina until it rests on or near your cervix.
Female condom	Hold the pouch with the open end hanging down. Squeeze the inner ring closed. Insert the inner ring and the pouch into the vaginal opening and slide it the rest of the way up into the vagina. The rim on the open end will stay outside your body.
Diaphragm	Apply a finger length of spermicide inside the dome and around the rim. Squeeze the sides of the rim so that the diaphragm folds with the spermicide inside. Insert the folded diaphragm in your vagina. Push the diaphragm as far as it will go, to the back of the cervix. Tuck the front rim behind your pubic bone. Check to be sure that your cervix is covered by the soft rubber dome of the diaphragm.
Cap	Fill one-third of the dome of the cap with spermicide. Fold the rim and slide the cap into your vagina as far as it will go. Press the rim around the cervix until the cervix is completely covered. Sweep your finger around the cap rim to make sure the cervix is completely covered. The cervix should not be felt outside the cap.
Sponge	Remove the sponge from the package. Moisten it with a small handful of clean water and squeeze it once. Insert the sponge into the vagina, with the fabric loop facing toward the outside of the body. Sliding the sponge along the back wall, push the sponge to the top of the vagina so that it covers the cervix.

AFTER INTERCOURSE

1. Remove your female condom immediately after intercourse, before you stand up.
2. Leave the cap, diaphragm, or sponge in place for at least 6 hours after intercourse.
3. It is fine to shower or bathe with a diaphragm, cap, or sponge in place, but do not use a douche. Douching is not recommended, but if you choose to do so, you must wait until at least 6 hours after intercourse, and after you have removed your device.
4. Check the position of your device. If it does not seem to be in correct position after intercourse, contact your clinician about emergency birth control.

REMOVAL

Method	Instructions for removal
Female condom	Squeeze and twist the outer ring to keep semen inside the pouch. Gently pull the condom out of your vagina.
Diaphragm	Hook your finger over the front rim or behind it, then pull the diaphragm down and out. Wash the diaphragm with plain soap and water and then dry it. Hold it up to the light to check for holes, tears, or cracks.
Cervical cap	Locate the cap rim on your cervix. Press or tip the cap rim until the seal against your cervix is broken, then tilt the cap off the cervix. Hook your finger around the rim and pull it sideways out of the vagina. Wash the cap with plain soap and water, and dry it. Check the cap for holes, tears, or cracks.
Sponge	Gently pull on the fabric loop to remove the sponge from the vagina. Make certain the sponge is whole and no parts are left inside the vagina.

TAKING CARE OF YOUR SPERMICIDE SUPPLIES, DIAPHRAGM, OR CAP

1. Store your supplies in a convenient location that is clean, cool, and dark.
2. Wash devices that will be used again. Do not use perfumed soap or talcum powder.
3. Do not use oil-based vaginal medications or lubricants such as petroleum jelly, mineral oil, hand lotion, vegetable oil, cold cream, or cocoa butter or some common vaginal yeast creams and vaginal hormone creams. If you need extra lubrication for intercourse, try contraceptive jelly or a water-soluble lubricant specifically intended for use with condoms.

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Fertility Awareness Methods (Natural Family Planning)

The woman and her family were undergoing hard times for the past 18 months. Because of the chaos in their lives, it had not been a good time to get pregnant, she said. At the same time, it was impossible to get family planning methods to prevent pregnancy because of disruptions in the supply routes. She listened carefully to another villager—a traditional birth attendant (TBA) who knows about women's cycles. It was from her that the woman learned to check her body signs and symptoms and to abstain until it was clear that her fertile days had passed. She and her husband continued to have sexual relations during the time she was not fertile: it helped them feel close and loving and more secure; it gave them some joy in their difficult lives.

Fertility awareness, or natural family planning, refers to methods for planning and preventing pregnancy by observing naturally occurring signs and symptoms of the fertile and infertile days of the menstrual cycle. (See Chapter 8 on The Menstrual Cycle and Disturbances.) If these methods are used to prevent pregnancy, the couple avoids intercourse on the days during the menstrual cycle when the woman is most likely to become pregnant (often called the fertile days).¹¹

Although sometimes referred to as natural family planning, these methods are not more "natural" than other methods of contraception. Some providers prefer the term "fertility awareness" to avoid the suggestion that some methods are more "natural" than others. "Fertility awareness" is the term used in this chapter.

Fertility awareness is based on two foundations:

- A scientific knowledge of the anatomy and physiology of the male and female reproductive systems
- An understanding of the signs and symptoms that occur naturally during the woman's menstrual cycle to indicate when she is fertile and when she is infertile

TYPES OF FERTILITY AWARENESS

CALENDAR RHYTHM

The calendar rhythm method is based on the fact that most women ovulate 12 to 16 days before each menstrual bleeding, no matter how long their menstrual cycle. The fertile phase is identified by using a mathematical calculation to determine the fertile and infertile phases. However, many couples who say they use the "rhythm" method do not know how to make this calculation and apply it to themselves.

BASAL BODY TEMPERATURE (BBT) METHOD

The BBT method is based on the pattern of the body's temperature at rest. A woman's temperature rises slightly after ovulation and remains elevated during the rest of her cycle until she menstruates. Monitoring the rise in temperature makes it possible to determine when she has ovulated and to calculate when her fertile days have passed. A woman who uses this method takes her temperature every day before she rises in the morning and carefully records it on a chart. She learns how to determine when the temperature shift has occurred. She abstains from intercourse from the beginning of her menstrual bleeding until she has had 3 days of elevated temperatures.

CERVICAL MUCUS METHOD

The cervical mucus method is based on detecting the changes in cervical mucus secretions and in the sensations in the vagina. Before ovulation, the cervical mucus becomes slippery and stretchy. The mucus changes are greatest around the time of ovulation. After ovulation, cervical mucus becomes thick or may disappear completely. A couple using this method to avoid pregnancy will abstain from intercourse when the mucus indicates the woman is fertile. They also abstain during menstrual bleeding. These couples should avoid intercourse on alternating days before the appearance of cervical mucus so that the presence of semen in the vagina does not change the natural appearance of the mucus.

SYMPTOTHERMAL METHOD

The symptothermal method combines recording the BBT with observing the cervical mucus and other physical signs of ovulation. These signs include tenderness of the breasts, midcycle pain, spotting or bleeding, and abdominal heaviness. A woman also may examine her cervix for changes in its position, degree of opening, and texture. When a couple is using the symptothermal method to avoid pregnancy, they abstain from intercourse from the first appearance or sensation of wet cervical mucus until after ovulation has been confirmed by 3 days of elevated temperature or 4 days of post-ovulation mucus.

Abstaining from intercourse on the days of the menstrual cycle when the woman's signs and symptoms indicate she may become pregnant is often called "periodic abstinence." This practice has long been common in many cultures throughout the world, particularly in Africa. Unfortunately, periodic abstinence has often been based on a misunderstanding of fertility rather than on accurate knowledge and understanding.⁵ The challenge to family planning providers is to provide correct information to African couples and to assist them in adapting their sexual practices so as to avoid pregnancy.

OVERCOMING BARRIERS TO USE

Perhaps the greatest barrier to the use of fertility awareness is that both clients and providers often lack the knowledge needed to use it effectively. Many women (and men) actually know very little about the physiology of reproduction. This barrier of ignorance leads to a second barrier: teaching takes time, and time is a scarce resource for many health care providers.

Overcoming a lack of knowledge about fertility is important. Family planning workers can hold group classes just before or after a session of individual visits. They can also ask knowledgeable clients to be volunteer class leaders. Traditional birth attendants (TBAs) can be asked to teach the women whose infants they deliver. On a community level, teachers and family planning workers can instruct students in schools and workers in places of employment.

Another barrier to using fertility awareness is that people have a prejudice that traditional methods are not as effective as modern ones. Yet, when the modern methods are not available because the client or the family planning distributor has run short, traditional methods such as those based on fertility awareness or withdrawal may be the only available means of avoiding an unplanned pregnancy.

MECHANISM OF ACTION

Fertility awareness methods are based on two major facts:

- The man's sperm can live in the woman's reproductive tract for 3 days.
- The woman's ovum can be fertilized before and on the day of ovulation.¹¹

If the couple can estimate when a woman will ovulate at least 4 to 5 days in advance¹⁰ and if they can identify when ovulation has occurred, they can then adjust their sexual practices, depending on whether they want a pregnancy.

EFFECTIVENESS

Effective use of fertility awareness methods requires that couples understand how to identify fertile days and then appropriately adapt their sexual behavior. Unintended pregnancies are primarily related to the user rather than to the method itself. A sizable but unknown portion of these pregnancies is due to improper teaching and poor use of the method.^{7,8} Experts at the World Health Organization suspect that sexual risk-taking during the fertile days accounts for more accidental pregnancy than does the inability to interpret charts accurately.¹²

Among typical users, approximately 20% fail during the first year of use.^{8,9} Among perfect users, the first-year pregnancy rate should be much lower, ranging from 1% to 9%. However, some versions of the method are more effective than others. The calendar rhythm method would be least likely to predict fertile days accurately and has a first-year pregnancy rate for perfect use of 9%.^{8,9} In contrast, when used perfectly, the symptothermal method has a first-year pregnancy rate of 2% and the cervical mucus method has a first-year pregnancy rate of 3%.

Perfect use means that the couple does not have intercourse on the days their method indicates the woman will be fertile. Imperfect use means that unprotected intercourse occurs during the fertile time.

Special consideration must be given to women who are breastfeeding. A breastfeeding woman often has mucus that indicates fertility even though the woman is not ovulating.^{1,4} Studies using ultrasound to detect ovarian activity have shown that breastfeeding women experience different patterns of follicular development before they return to normal fertile cycles.² (See Chapter 12 on Lactation and Postpartum Contraception.) According to studies conducted in Kenya, Chile, and the United States, breastfeeding women have an increased risk of unplanned pregnancy (versus nonbreastfeeding women) when using the cervical mucus method. However, because breastfeeding in itself decreases fertility, women who were using the cervical mucus method while breastfeeding had a pregnancy rate comparable to that of nonbreastfeeders.⁷

ADVANTAGES AND INDICATIONS

1. Fertility awareness methods produce no physical side effects. Surveys in many African countries indicate that fear of side effects is an important reason why women do not use contraceptives.
2. Use of fertility awareness can increase a woman's self-awareness and couple's knowledge of the woman's reproductive system. The woman observes her signs and symptoms of fertility, and a couple gains the information necessary to practice fertility awareness. Programs in numerous African countries report that clients are highly interested in and capable of learning this information.
3. Fertility awareness users develop self-reliance when they have learned to use the method correctly and do not need to depend on a family planning program or other source to provide contraceptives. This is particularly important in Africa, where family planning services are not available in many areas and systems for distributing contraceptives are often unreliable.
4. Fertility awareness entails no cost once the couple has learned to use the method, unless they are using a temperature-based method requiring a special thermometer.
5. Fertility awareness requires the man's involvement in family planning. Several studies of family planning in Africa stress the importance of male involvement in effective family planning.
6. While fertility awareness services must be provided by trained fertility awareness teachers, numerous studies have shown that community-level personnel, including those with low literacy, can provide services successfully. Many regions in Africa have a shortage of skilled medical personnel.
7. Natural family planning can assist a couple in achieving a wanted pregnancy.

DISADVANTAGES AND PRECAUTIONS

DISADVANTAGES

1. Most couples require at least 3 cycles to use the cervical mucus method or the symptothermal method correctly. During the time a couple is learning these methods, they need frequent contact with the fertility awareness teacher. When the teacher and client are far apart, as is true in many rural areas, the need for frequent contact can be an obstacle.
2. The commitment, motivation, and cooperation of *both* partners are important. Many family planning professionals have expressed concern about the difficulty of involving men, especially when the method requires abstinence.
3. The woman must observe and note her fertility signs and symptoms. For women who lack privacy or who are not literate, record-keeping may be difficult. Some programs have developed simplified record-keeping systems. In some settings, programs have developed systems in which the couple does not need to maintain written records.
4. Fertility awareness methods are less forgiving of user errors, which means they are less effective than some other methods of family planning. Studies are needed to determine the actual use effectiveness of all user-dependent family planning methods in Africa.
5. When fertility awareness methods are used to prevent pregnancy, some couples experience emotional stress as a result of not being able to have intercourse for several days of the woman's cycle. In some cultures, it may be acceptable for the man to have sexual relationships with more than one woman. In these cases, abstinence may apply only to the woman and not to the man (this practice could increase the risk of sexually transmitted infections).
6. Use of fertility awareness methods does not directly protect against sexually transmitted infections, including HIV. In areas of high levels of sexually transmitted infections, methods that maximally protect against infection are warranted.

In cultures where abstinence pertains only to the woman, the man's sexual practices with an alternative partner could increase the spread of infections.

It has long been thought that if the ovum or sperm is aged, there is more chance for abnormal development of the embryo. Two recent studies of pregnancies among women using fertility awareness methods showed no excess risk of spontaneous abortion or birth defects in pregnancies conceived with aged sperm or ova.^{3,10}

*No matter what other methods of contraception a woman is using, if she is at any risk because her partner tests HIV positive or because she does not know her partner's HIV status, she should be advised to use plastic or latex condoms with every sexual act.
No other contraceptive method besides abstinence provides the same degree of protection.*

PRECAUTIONS

Women with the highest risk of reproductive morbidity or mortality should be advised to use the most effective methods for avoiding pregnancy. For these women, fertility awareness methods may not be appropriate. In addition, experience has shown that women who are partially breastfeeding, have infections that produce a vaginal discharge, or experience irregular cycles may have more difficulty using the method than do healthy women with regular cycles.

Women or couples who have the following characteristics are less likely than other couples to be able to use fertility awareness methods successfully:

- Inability to communicate about sexual matters
- Unstable relationship

- Inability or unwillingness to observe, record, and interpret fertility signs and symptoms
- Inability or unwillingness to abstain from sexual intercourse during the fertile phase of the woman's cycle

PROVIDING FERTILITY AWARENESS METHODS

Surveys in several African countries indicate that many couples use periodic abstinence as their primary method of avoiding pregnancy. Data from recent Demographic and Health Surveys are shown in Table 18:1.

Table 18:1 Percent use of family planning and periodic abstinence in selected African countries

Country	Use family planning	Use periodic abstinence	Periodic abstinence as % of family planning
Burkina Faso	10	4	40
Cameroon	14	7	50
Ghana	20	8	40
Kenya	33	4	12
Senegal	7	1	14
Tunisia	51	7	14
Uganda	15	4	27

Source: Curtis SL et al. (1996); Statistics Department [Uganda] and Macro International (1996).

The women interviewed for these surveys gave several reasons for using periodic abstinence, ranging from fear of side effects from modern methods to religious beliefs to the unavailability of other methods. Although educational programs to dispel myths and expanded efforts to increase the availability of modern methods are important (and are under way in several countries), they are a long-term investment and likely to have limited impact in Africa during the next decade. So, in the short term, fertility awareness methods will remain important.

Efforts must continue to improve their quality, the public's knowledge of them, and the effectiveness with which they are used.

There are also other reasons for supporting the use of fertility awareness methods in Africa—they may fit well within traditional cultural practices, and using these methods does not require highly skilled medical providers (although fertility awareness teachers need to be well trained and supervised). Fertility awareness methods can meet the needs of couples who live in areas remote from family planning services or in areas where distribution systems cannot guarantee a constant supply of contraceptives. Fertility awareness also can be a low-cost approach when viewed from both the individual family or the national perspective: there are no imported commodities to buy that would require the use of hard currency.

SERVICE DELIVERY ISSUES FOR AFRICA

Two issues related to the effectiveness of fertility awareness methods have particular relevance for Africa: development of services and availability of trained fertility awareness teachers.

Development of services

A study of fertility awareness programs in Zambia and Liberia found that women's risks of unintended pregnancy depended on age, breastfeeding status, urban/rural residence, employment status, whether they enrolled when the fertility awareness program was just beginning or when it was more established, and the frequency of contact with the provider.⁶ The most significant factor for successful use of fertility awareness methods was the time at which the women enrolled in a program. Those who enrolled when the program was just beginning (and thus had less well developed services) were at significantly higher risk of an unwanted pregnancy than were those who enrolled later.⁶

Fortunately, a significant effort has been made to develop fertility awareness programs in Africa. Programs now exist in virtually all countries in the region and can serve as direct service providers or trainers of providers in other institutions. Although these programs

suffer from a lack of funding and technical assistance, they can be expected to increase the effectiveness of fertility awareness methods in Africa during the next decade.

Availability of trained fertility awareness teachers

Fertility awareness is an education-based method rather than a commodity-based service. Having a knowledgeable, competent teacher is essential. Teachers in many African countries have been trained by trainers based outside the region. Only recently have a significant number of in-country teacher training programs been developed; however, follow-up with trainers remains a challenge.

INSTRUCTIONS FOR USING FERTILITY AWARENESS METHODS

Fertility awareness methods increase a woman's knowledge of her body and her menstrual physiology, and education and knowledge are two important ingredients for effective family planning. However, these methods do not protect against HIV infection or other STIs.

CALENDAR RHYTHM METHOD

Use a standard calendar or a menstrual diary. Record the length of each menstrual cycle over the most recent cycle or the next 6 to 12 cycles. Call the first day of bleeding in each cycle day 1. The last day of each cycle is the day before the next menstrual bleeding.

- To find the earliest day on which you are likely to be fertile, subtract 18 days from the length of your shortest cycle.
- To find the first day you are no longer likely to be fertile, subtract 11 days from your longest cycle.

If, for example, your menstrual records show that your shortest cycle was 27 days and your longest cycle was 30 days, the first fertile day will be Day 9 of your cycle ($27 - 18 = 9$) and the first day you are

no longer likely to be fertile will be day 19 ($30 - 11 = 19$). In this case, you would abstain from day 9 to day 19 of your cycle. Table 18:2 shows the fertile phase, depending on cycle length.

Table 18:2 How to calculate your fertile period

If your shortest cycle has been (# of days)	Your first fertile (unsafe) day is	If your longest cycle has been (# of days)	Your last fertile (unsafe) day is
21*	3rd	21*	10th
22	4th	22	11th
23	5th	23	12th
24	6th	24	13th
25	7th	25	14th
26	8th	26	15th
27	9th	27	16th
28	10th	28	17th
29	11th	29	18th
30	12th	30	19th
31	13th	31	20th
32	14th	32	21st
33	15th	33	22nd
34	16th	34	23rd
35	17th	35	24th

*Day 1 = First day of menstrual bleeding.

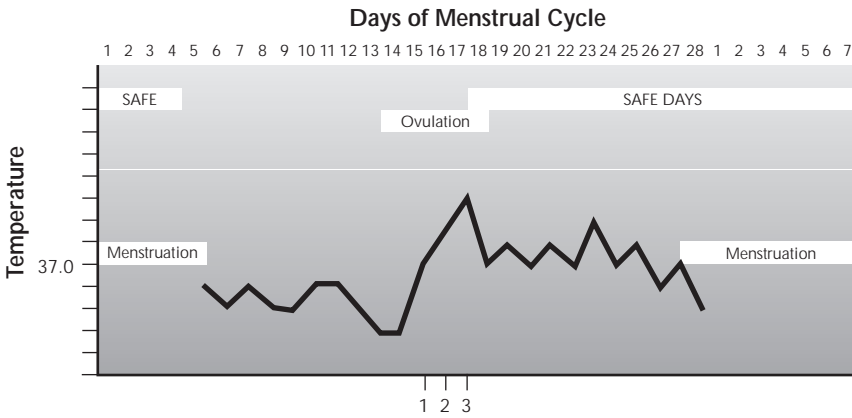
BASAL BODY TEMPERATURE METHOD

During your menstrual cycle, your basal body temperature (BBT), which is the temperature of your body at rest, rises at least 0.3-0.5° C. This rise is called the thermal shift. Ovulation most often occurs on the day of the thermal shift, 1 to 2 days before the shift, or the day after.

To use this method, follow these directions:

1. Do not have intercourse from the first day of menstrual bleeding until the thermal shift has occurred and your temperature has stayed at or above the higher level for 3 consecutive days. To determine your temperature:
 - Take your temperature before rising each morning (at the same time each day) for the first 10 days of the menstrual cycle. Record the temperature in the special BBT chart.
 - Look at the chart (see Figure 18:1 for an example) to find the highest of the normal temperatures during the first 10 days of your cycle, but disregard any that are abnormally high because of fever or other disruptions.
 - Draw a line 0.15° C above the highest of these 10 temperatures. This line is called the cover line, or the temperature line.
 - Continue taking your temperature every day until your third consecutive temperature is recorded above the cover line.
2. You can have intercourse any time after the evening of your third consecutive high temperature until the beginning of your next menstrual bleeding.

Figure 18:1 Basal body temperature variations during a model menstrual cycle



CERVICAL MUCUS METHOD

To use the cervical mucus method, you must observe and record your cervical mucus signs every day, beginning with the day after your menstrual bleeding ends. The following rules will help you practice this method. (See Table 18:3 for a summary of signs and symptoms during the fertile and nonfertile days.)

1. Do not have intercourse during the days of your menstrual bleeding.
2. During the early infertile phase of your cycle (before ovulation), you can have intercourse on the evening of every other dry day (the days when you do not have any cervical mucus or feel any vaginal wetness). Because semen changes the character of mucus, it is necessary to check cervical mucus on days that semen is not present in the vagina.

Table 18:3 Summary of cervical mucus method

Approximate cycle day: phase	How identified	Intercourse allowed?
1–5: Menstruation*	Bleeding	No
6–9: Dry days	Absence of cervical mucus	On alternate nights only
10: Fecund period begins	Onset of sticky mucus secretion (gradually becomes slippery over following days)	No
16: Peak fecund day	Last day on which slippery mucus (resembling raw egg white) is observed	No
20: Fecund period ends	Evening of the 4 th day after the peak day	After fecund period ends
21–29: Safe period	From end of fecund period until onset of bleeding	Yes

*The cycle begins on the first day of menstruation.

3. The first day you have any cervical mucus or notice any vaginal wetness is the beginning of your fertile phase. You should not have intercourse from the beginning to the end of the fertile phase.
4. The last day you have cervical wetness or vaginal wetness is called your peak day. When you stop having wet cervical mucus or experiencing vaginal wetness, continue to abstain from intercourse for 3 more days.
5. On the morning after your third day of no wet cervical mucus or wet vaginal sensation, you can have intercourse until your next menstrual bleeding begins.

SYMPTOTHERMAL METHOD

The symptothermal method has several variations. To use this method, you will need to note the length of your most recent 6 to 12 menstrual cycles (see Calendar Rhythm Method), take your temperature daily (see Basal Body Temperature Method), observe and interpret your cervical mucus (see Cervical Mucus Method), and observe and interpret other signs and symptoms such as changes in the position and firmness of your cervix, breast tenderness, and pain between menstrual cycles. You will need to record this information on a special chart and interpret it to determine when you are fertile and when you are infertile.

1. Begin taking your temperature the first day of menstrual bleeding and continue taking it as described for the basal body temperature method. Remember to take your temperature every morning before rising.
2. After your bleeding stops, you can have intercourse on the evening of every other (alternate) day during the time when you do not observe any cervical mucus or feel any wet vaginal sensations or until your first fertile day (as calculated by subtracting 20 from the number of days of your shortest menstrual cycle, whichever occurs first).
3. Abstain from intercourse as soon as you observe any cervical mucus, feel any wet vaginal sensation, or until the day of your cycle indicated by subtracting 20 from the number of days in your shortest menstrual cycle.
4. When your mucus stops or you do not feel vaginal wetness, continue abstaining from intercourse for 3 or more days or until you have three temperatures above the cover line (whichever occurs last).
5. You can have intercourse after the third day from the end of your cervical mucus or vaginal wetness or after your third high temperature, until the beginning of your next menstrual bleeding.

Natural Family Planning Chart

The Menstrual Cycle Chart can help you keep track of your signs and symptoms. (See Figure 18:2). The chart can also be used for the other fertility awareness methods. Follow these instructions to fill out the chart:

In the Cycle Length Box

- Write the number of days in the shortest of your previous six menstrual cycles.
- Subtract 18 from the length of the shortest cycle, and write this number in the next small box (for example, $28-18=10$).

In the Temperature Box

- Record the time of day you usually take your basal body temperature.

In the Menstrual Cycle Day Box

- The line of numbers at the bottom of the temperature chart represent the days of your menstrual cycle, starting with the first day of your period. Each day you have sexual intercourse, circle the corresponding day of your menstrual cycle.

To Record Temperature

- After taking your temperature each morning, put a circle in the middle of the square which corresponds to your temperature on that particular date.
- Connect the dots each day with a straight line.
- After recording your temperature for the first 10 days of the cycle, draw a horizontal line on the line just above the highest of the normal low temperatures recorded during those first 10 days. This is called the “coverline.”
- Once your daily temperature goes above this coverline, draw a vertical line just before the temperature rise.
- Count 1, 2, 3 temperatures above the coverline.

To Record Cervical Secretions

- After checking the feel, look, and touch of your secretions throughout the day, fill in the box that best describes your most fertile secretion for that day of your cycle. At the end of each day, shade only one box to show what your secretions were like:
 - Wet, slippery, transparent, or stretchy secretions
 - Non-wet, white, cloudy, or sticky secretions
 - Dry, no secretions seen or felt
 - Period, for days of menstrual bleeding

To Record Changes in Your Cervix

- If you choose to check the cervix, fill in the box that best describes the most fertile position, feel, and openness of the cervix. At the end of each day, mark the box for only one of the following options:
 - Low, firm, or closed cervix
 - High, soft, or open cervix

To Record Comments

- Use the comments section at the bottom of the chart to record other signs of fertility, disturbances, changes in your daily schedule, and other things that may influence your interpretation of the chart.

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Coitus Interruptus (Withdrawal)

"We live far from the city. A woman must take one entire day to visit the family planning clinic. My son will be married next month. I have told him about how he can spill his seed outside of his wife. Although modern family planning methods are best—my own wife gets the injection—there are times when a man and woman feel loving but may have run out of their contraception. I pray that my son has a healthy family, and that to me means also that the children are wanted. My father told me about spilling my seed on the ground, and so I tell my son."

Trying to control fertility through coitus interruptus, or withdrawal, was a natural response to the discovery that ejaculation into the vagina caused pregnancy. Historically, coitus interruptus was widely practiced⁸ and played a predominant role in the fertility declines that took place before modern contraceptive methods were developed. Although few women report using withdrawal as their primary method of family planning, many couples have probably used the method as a back-up option during their reproductive years.

OVERCOMING BARRIERS

Very few barriers exist to discourage couples from using withdrawal as a contraceptive method. The primary barrier is probably the attitude among health professionals that withdrawal is ineffective as a contraceptive. This attitude may be transmitted to men and women in the community. In reality, withdrawal is a reasonably effective method that can be used by couples who wish to space births and do not have contraindications to pregnancy or extremely strong desires to avoid pregnancy. When pregnancy is definitely not wanted, a more effective contraceptive is needed. For many couples, however, withdrawal would have a number of advantages, including its being a traditional method that is always readily available. The attitudinal barrier could be overcome by education and counseling. Health professionals and care-givers should avoid making negative statements about the method.

MECHANISM OF ACTION

Coitus interruptus prevents fertilization by stopping contact between spermatozoa and the ovum. The male partner interrupts intercourse and withdraws his penis from his partner's vagina before he ejaculates.

EFFECTIVENESS

Although coitus interruptus has often been criticized as ineffective, it probably offers a level of contraceptive protection similar to that provided by vaginal barrier methods. Its effectiveness depends largely on the male's ability to withdraw before he ejaculates. How effective the method would be if used consistently and correctly is unknown. Our best guess is that about 4% of perfect users would fail in the initial year.¹⁰ Among typical users, about 19% would fail during the first year.

ADVANTAGES AND INDICATIONS

As a method of birth control, withdrawal has several distinct advantages. It costs nothing, requires no devices, involves no chemicals, is available in any situation, and causes no medical side effects. Couples who cannot or do not wish to use other contraceptive methods and who can accept the possibility of unintended pregnancy would find withdrawal an acceptable alternative. It is a back-up contraceptive that is always available.

DISADVANTAGES AND CAUTIONS

Coitus interruptus has several disadvantages.

- For some couples, interruption of the excitement or plateau phase of the sexual response cycle may diminish pleasure.
- The method does not forgive incorrect or inconsistent use.
- Contraceptive failure may be due to the lack of self-control that is required to use the method. With impending orgasm, men (and women) experience a mild to extreme clouding of consciousness during which coital movement becomes involuntary.⁵ The man may feel the urge to achieve deeper penetration as he nears orgasm, and he may not withdraw in time to avoid depositing semen in his partner's vagina or on her external genitalia.
- The couple is not protected from sexually transmitted infections (STIs), including the human immunodeficiency virus (HIV). Surface lesions, such as those from herpes genitalis or human papillomavirus, may be infective. Not only does unintentional ejaculation pose a risk for infection, but so does the pre-ejaculate fluid. The pre-ejaculate fluid can contain HIV-infected cells,^{4,7} although epidemiologic studies have not determined the potential of the pre-ejaculate to infect a man's sexual partner. In one prospective study, the condom failed to protect some sexual partners against gonorrhea, because they were exposed to infectious secretions before the condom was used.¹

A study of stable couples in which the man was HIV-infected but the woman was not showed that coitus interruptus was somewhat better than regular, unprotected penile-vaginal intercourse at keeping the woman from becoming infected. This method reduced the HIV conversion rate of women by half in one study⁶ and by an even larger percentage in another.² Still, although coitus interruptus may decrease HIV exposure by reducing the amount of semen that enters the vagina, the seminal fluid that emerges from the penis prior to ejaculation may contain some HIV (as well as a small number of sperm).³ Because a significant number of women have become infected with HIV while their partners consistently practiced withdrawal, caregivers or educators should not recommend withdrawal as a method for preventing HIV infection in women.

Studies that have found withdrawal to be beneficial in reducing HIV infection looked only at stable heterosexual couples. Findings from these studies may not hold true for women with several HIV-infected partners. Finally, coitus interruptus has not been studied as a way to reduce HIV transmission from women to men, but there is little reason to assume it would be helpful.

It is possible that the pre-ejaculate fluid sometimes carries sperm into the vagina. Although the pre-ejaculate, a lubricating secretion produced by the Littre or Cowper's glands, contains no sperm, a previous ejaculation may have left some sperm hidden within the folds of the urethral lining. In one study, researchers found no sperm in 16 samples of pre-ejaculate from men who did have sperm in the ejaculate.⁴ Examinations of the pre-ejaculate in another small study⁷ found the pre-ejaculate to be free of spermatozoa in 11 of 11 HIV seronegative men but only 4 of 12 HIV- seropositive men. Although the 8 samples that contained spermatozoa revealed only small clumps of a few hundred sperm, these might still pose a risk of fertilization. In all likelihood, the spermatozoa left from a previous ejaculation could be washed out with the force of a normal urination. However, this remains unstudied.

PROVIDING THE METHOD

The clinician or educator cannot assume that a man already knows how to use the withdrawal method correctly. Discussion about contraception should, therefore, include instructions for using withdrawal.

Explain that the couple may have penile-vaginal intercourse until ejaculation is impending, at which time the male partner should withdraw his penis from the vagina and away from the external genitalia. The man must rely on his own sensations to determine when he is about to ejaculate. Because neither the man nor the woman is likely to notice the release of the pre-ejaculate, which normally happens just before full ejaculation, they should not rely on that event as a way of timing withdrawal. The sexually inexperienced man may find it particularly difficult to achieve the self-control required to practice withdrawal. You might suggest that the man practice withdrawal by bringing himself to ejaculation without his partner's assistance so that he becomes more aware of his pre-ejaculatory sensations.

Because sperm may be present in semen left behind in the urethra after ejaculation, suggest that the man urinate after intercourse, especially if he plans to have intercourse again very soon.

INSTRUCTIONS FOR COITUS INTERRUPTUS

For centuries, African men have used withdrawal to avoid getting their partners pregnant. However, the man who uses withdrawal must be aware of the sensations he feels so he can predict when he will ejaculate.

1. Before intercourse, the man should urinate, then wipe off the tip of the penis to remove any remaining sperm from a prior ejaculation.
2. When he feels he is about to ejaculate, the man should withdraw his penis from his partner's vagina, making sure that ejaculation occurs away from her genitalia.

3. Withdrawal is not a good contraceptive method under the following conditions:
 - The man cannot predictably withdraw prior to ejaculation.
 - The man intends to have repeated orgasms, which may cause the pre-ejaculate to contain spermatozoa.
4. Withdrawal does not protect against infection with the human immunodeficiency virus (HIV); it does not protect against other sexually transmitted infections (STIs) either, although the question remains to be studied. Abstinence or condoms provide far better protection against STIs.
5. Withdrawal is a considerably better method of contraception than no method at all.
6. The couple should learn the options available for postcoital protection, should any ejaculate come in contact with the vagina. The couple should have available a supply of emergency contraceptive pills, birth control foam, or some type of spermicide in case of unintentional ejaculation in or near the woman's vagina. The woman should use the spermicide as quickly as possible after ejaculation. (Despite the optimism of this suggestion, it is probably too late to stop some sperm from swimming up into the uterus and to protect against STDs, including HIV.)

No matter what other methods of contraception a woman is using, if she is at any risk because her partner tests HIV positive or because she does not know her partner's HIV status, she should be advised to use latex or plastic condoms with every sexual act.

No other contraceptive method besides abstinence provides the same degree of protection.

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Abstinence

I find that a number of clients who come to the clinic are in relationships that involve significant periods of abstinence. I make certain that I encourage couples who abstain. Abstinence, with back-up contraception or protection for sexually transmitted infections, is one of the most effective methods I recommend in my practice of family planning.

Throughout history, sexual abstinence has probably reduced fertility more than any other contraceptive method.² Individuals abstain from sexual intercourse for a number of reasons. Some freely choose abstinence within a relationship; others choose it by not pursuing a mate. Some abstain because cultural practices place taboos on intercourse before marriage or postpartum. Others may have a sexual dysfunction such as impotence or severe pelvic pain, that makes intercourse difficult or impossible.

OVERCOMING BARRIERS

For some individuals, such as the unmarried, abstinence is not only encouraged, but expected. Some other individuals, however, face significant barriers to practicing abstinence:

1. **Biases.** Providers need to overcome their biases about an abstinence. Not everyone has the same sexual needs or desires.

2. **Communication.** Couples need to communicate. Individuals who wish to abstain because of a physical problem, for example, need to tell their spouses. Fear of an unwanted pregnancy also needs to be communicated.
3. **Myths.** The mythologies about abstinence are not true: those who practice abstinence do not “dry up,” are not necessarily uncaring, and are not abnormal simply because they choose to abstain.
4. **Expectations.** Cultural and familial expectations that a married person must engage in sexual intercourse are often strong. In some cases, couples may need to communicate about what abstinence means in their relationship—is the abstinence short term, for the duration of the postpartum period, or for the long term, as happens in cultures that expect an older woman to stop having sexual relations altogether? In other cases, where the roles of husband and wife are largely defined by the expectation of sexual intercourse, negotiations about the timing and frequency of intercourse, rather than complete abstinence, may be more successful.

MECHANISM OF ACTION

The definition of abstinence varies according to each individual or culture. Some people define abstinence as refraining from all sexual behavior, including masturbation. Others define abstinence as refraining from any sexual behavior involving genital contact. In this chapter, abstinence is defined as refraining from vaginal or anal intercourse. Contrary to popular belief, both men and women who abstain can still be sexual. Touching—for nurture, solace, communication, simple affection—can be very sensual. Most people enjoy sexual touching, which takes a wide range of forms other than penile penetration.

EFFECTIVENESS

When practiced perfectly, abstinence is absolutely effective. Among typical users, however, there may be a risk of pregnancy when a form of the practice allows semen to come in contact with the woman's genitalia. The risk of such contact is unknown.

ADVANTAGES AND INDICATIONS

Abstinence protects against unintended pregnancy. When the only goal of abstinence is to avoid unwanted pregnancy, the couple can still engage in other forms of sexual expression, except for penis-in-vagina intercourse or practices that would allow semen to come in contact with the woman's genitalia.

Abstinence, in some variations, can also protect against sexually transmitted infections (STIs). Couples need to avoid practices that bring the partner in contact with body fluids such as pre-ejaculatory fluid, semen, cervical-vaginal secretions, blood, or open sores.

At times, a medical condition may require abstinence:

- Postoperative pain or tenderness, such as from episiotomy, hemorrhoidectomy, vasectomy, other procedures
- Pelvic, vaginal, or urinary tract infection
- Gastrointestinal illness or infection
- Painful intercourse (dyspareunia) or other pelvic pain
- Undiagnosed postcoital bleeding
- Untreated postmenopausal atrophic vaginitis
- The woman in the late third trimester of pregnancy, postpartum, or postabortion
- Postmyocardial infarction
- Certain disabling physical conditions
- Known or suspected allergic sensitivity to partner's semen

- The man or woman (or both) is undergoing therapy for a variety of sexual problems, such as erection difficulty, orgasm difficulty, or premature ejaculation

Other reasons for abstaining are personal. Individuals may abstain to observe religious holidays, to pursue other aspects of a relationship, to remain faithful to a spouse who is absent, to mourn the death of a spouse, or any other reasons. Abstinence is a normal choice that practitioners can support through encouragement.

POSTPARTUM ABSTINENCE

In sub-Saharan Africa, abstinence has long been associated with the postpartum period. The purposes of postpartum abstinence in many cultures were to protect the newborn infant, because semen was thought to spoil the mother's milk, and to protect the mother during a period of recuperation. Many African populations considered abstinence not as a means for spacing, but as a way of purifying the mother's milk.

Over time, reliance on postpartum abstinence has eroded.³⁻⁵ The taboos against intercourse have been reduced. Postpartum abstinence may soon disappear as a means to decrease fertility.⁵

The duration of abstinence among women varies by regional and cultural practice. In Togo and Ghana, for example, where polygyny (the husband has more than one wife) is common, the period of postpartum abstinence may last several months to more than a year. A study in Zaire found postpartum abstinence to be practiced longer by women who were poor and less educated, had a large number of children, breastfed for a long time, or lived in an urban area.³ The median length of postpartum abstinence in a number of African nations is shown in Table 20:1.

Postpartum abstinence actually doubles protection against pregnancy, because it occurs at the same time that the woman has reduced fertility from amenorrhea associated with breastfeeding.⁷ (See Chapter 12 on Lactation and Postpartum Contraception.) In some areas of

Africa, however, a declining use of postpartum abstinence not accompanied by an increase in the use of modern contraceptives could mean that many infants are prematurely weaned because of the mother's new pregnancy.⁵

Table 20:1 Mean duration of postpartum abstinence

Country	Year	Months
Burkina Faso	1993	19
Cameroon	1991	13
Central African Republic	1994-95	10
Cote d'Ivoire	1994	12
Ghana	1993	9
Kenya	1993	3
Madagascar	1993	4
Mali	1995-1996	3
Namibia	1995-1996	6
Niger	1992	2
Nigeria	1990	11
Rwanda	1992	<1
Senegal	1997	3
Sudan	1989-1990	5
Tanzania	1996	6
Tunisia	1988	3
Uganda	1995	2
Zambia	1996	5
Zimbabwe	1994	4

Source: Data from the Demographic and Health Surveys

PREMARITAL ABSTINENCE

In many areas, an unmarried woman is expected to avoid sexual intercourse. Nonetheless, many African women do have intercourse before marriage.¹ As many as 60% of unmarried adolescent women in Botswana, 46% in Liberia, 50% in Kenya, and 44% in Senegal report having had sexual experience. Still, remains high in other regions, such as Burundi (91%), Zimbabwe (68%), and Namibia (65%).

Premarital abstinence among unmarried men is encouraged in some cultures but not in others. Clearly, if both men and women were expected to abstain before marriage, it would be easier for unmarried couples to practice abstinence. (See Chapter 4 on Adolescent Women and Reproductive Health.)

DISADVANTAGES AND CAUTIONS

Abstinence has few disadvantages. The primary disadvantage occurs when one partner wants to be abstinent but the other does not. Because in most cultures married couples are expected to have sexual intercourse, spouses may believe their partner does not have the right to abstain. The partner who wants to be abstinent may have to engage in sexual intercourse anyway or suffer the spouse's anger, the threat of divorce, or a partner's extramarital affair.

PROVIDING CARE TO THE ABSTINENT CLIENT

The provider can support a couple's or individual's choice to abstain. For many people, abstinence is a temporary practice that ceases once an individual's or couple's situation changes. Thus, the provider should educate all abstinent persons about the other methods of birth control and safer sex, including:

- Effective non-prescription methods
- Sources for prescription methods
- Emergency contraception
- STI protection skills to avoid contact with body fluids or open sores on the genitals (See Chapter 16 on Condoms and Chapter 5 on HIV, AIDS, and Reproductive Health.)

INSTRUCTIONS FOR CLIENTS USING ABSTINENCE

1. Decide what you want to do about sex at a time when you are clear headed, sober, and feel good about yourself. If you have a partner, decide together at a time when you feel close to each other but not sexual. For example, try talking while you take a walk and hold hands.
2. Decide in advance what sexual activities you will say "yes" to and discuss these with your partner.
3. Tell your partner, very clearly and in advance—not at the last minute—what activities you will not do.
4. Avoid high-pressure sexual situations; stay sober.
5. Learn about birth control and safer sex so that you will be ready if you change your mind. Always keep condoms around. Always.
7. Learn about emergency birth control options and keep a supply available in case you have intercourse when you do not expect it.

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Tubal Sterilization and Vasectomy

"You are wise to think about the health of your family and how you can provide for the children you already have," the doctor told the couple. "I can tell you that either the man or the woman can be sterilized. Both ways are very effective and neither the man nor the woman suffers an ill effect on health or on the ability to enjoy sexual relations." The doctor explained both tubal ligation and vasectomy. Then he left the couple for a little while so they could discuss the decision between themselves. Because the woman was pregnant, the couple decided she would have a tubal ligation just after her child was delivered.

In 1990, more than 170 million couples of childbearing age in developing countries used voluntary surgical contraception (VSC), making it the most widely used method of family planning in the world.^{31,32} The popularity of sterilization reflects its effectiveness, safety, and high client satisfaction. In African nations, however, use of tubal sterilization remains low and use of vasectomy is under 1%.

Many factors have contributed to the improved safety of VSC over the past 20 years: improved anesthetic methods, better surgical techniques and asepsis, increased use of local anesthesia with light sedation, improved training of personnel, and better selection and monitoring of patients. Vasectomy and female sterilization are compa-

rable in effectiveness, and both are permanent. If both were equally acceptable to a couple, vasectomy would be medically preferred, because it is a more minor procedure, more effective in the long run, and less costly.

OVERCOMING BARRIERS

Access to VSC services depends on the attitude of a particular country's government toward population growth, the legality of sterilization, and the requirements or conditions that must be met for an individual (especially a woman) to undergo a sterilization procedure. Some of these conditions have been established to make sterilization safer, such as requiring that sterilization be performed by a physician. Some conditions are aimed at preventing a couple from regretting their decision to have sterilization, such as requiring that couples be a minimum age or have a minimum number of living children. Some countries require approval of a committee.

Cultural conditions also influence the use of VSC. For example, 23 sub-Saharan countries require the husband's approval for female sterilization, and seven countries require the wife's approval for vasectomy. Niger is unique in that, in addition to spousal consent, a woman must also have the approval of her parents and her husband's parents.³¹

Misconceptions and cultural and religious barriers prevent many men from being sterilized. Education and counseling are important ways of helping men to understand the advantages of vasectomy. For example, questions commonly asked by men include:

Question: *Is vasectomy the same as castration?*

Answer: No. Vasectomy blocks the pathway that sperm use to get into your semen. Your testicles are not removed or damaged in any way (find the words in the client's local language that best explain what is happening technically).

Question: *How will vasectomy affect my manhood?*

Answer: Vasectomy does not affect your manhood. Your penis will still become erect like before. You will still produce semen and ejaculate as before. You will not lose your desire for sex.

Question: *Will I still enjoy sex?*

Answer: The operation should have no effect on your ability to enjoy sex. It merely prevents sperm from getting into the semen.

Question: *What happens to the sperm?*

Answer: They die in the blocked tube and the body absorbs them.

Question: *Are there any long-lasting effects from vasectomy?*

Answer: There are no proven long-lasting effects that have been seen in vasectomized men. Some report that their wives enjoy sex more because they are no longer worried about getting pregnant.

COUNSELING FOR MALE AND FEMALE STERILIZATION

Sterilization is a permanent method of contraception; once the surgery is performed, the individual cannot simply change his or her mind. Few male or female VSC reversals are performed in Africa. A number of circumstances, usually hard to predict, may lead users to regret that the sterilization procedure was performed: losing their children, getting divorced or remarried, or wishing for additional children.

Make certain the individual correctly understands the procedure and its consequences. Check your local family planning or maternal and child health (MCH) service policies and standards for guidelines on counseling. Or use the following outline, which spells BRAIDED:

B = Benefits. Explain that a single decision to undergo sterilization provides a permanent, highly effective, and "natural" method of birth control.

R = Risks. Explain that infection, bleeding, and complications of anesthesia may occur, and that there is still a slight chance of future pregnancy. Inform the client that procedures to reverse sterilization are expensive, involve major surgery and risk, are not available to everyone, and are often unsuccessful. Warn the client that sterilization does *not* protect against sexually transmitted infections (STIs), including the human immunodeficiency virus (HIV). Instruct clients to wear condoms to protect themselves against HIV or other STIs.

A = Alternatives. Discuss alternative reversible contraceptive methods and also sterilization for the partner.

I = Inquiries. Encourage the client to ask questions; discuss myths and correct misinformation.

D = Decision to change. The client must be free to decide against surgical contraception without loss of any medical or financial benefits.

E = Explanation. Explain in detail the entire procedure and its possible side effects. Emphasize the permanence of the procedure. Explain what is known about effects on future health and sexual response. Inform the clients of any costs they will bear. Give the client instructions for before and after the operation.

D = Documentation. Make notes of the method and timing of surgical contraception as well as any complications, including their management and outcome.

POSTPARTUM COUNSELING

The client must be given sufficient time to make a thoughtful, informed decision about a permanent method of contraception, especially if the client is a woman considering immediate postpartum or postabortion (spontaneous or induced) sterilization. Whenever possible, the woman should have decided she wants a permanent method well before delivery or a pregnancy-related procedure. Her decision may be unduly influenced by the emotional and physical stress produced by the pregnancy. Clients who are sterilized in the immediate

postpartum or postabortion period are more likely to regret having had the procedure.⁴³ These times are often ones of stress for a woman. At the appropriate time, service providers can help by exploring a couple's attitudes and mentioning all the options. Make very certain the couple understands that the method is permanent.

After delivery or abortion, wait to counsel the woman until she is free of the immediate stresses and not under the influence of sedatives. If the woman clearly desires no more children, she may be a suitable candidate for VSC. Where appropriate and possible, include the husband in these discussions. Medical problems such as eclampsia, postpartum hemorrhage, or intrapartum or postpartum infection require postponing the VSC procedure until the woman is well enough to undergo surgery.

Staff should be skilled in explaining and providing alternative postpartum methods, such as an intrauterine device (IUD) or Norplant, that may be inserted immediately following abortion or childbirth. Women should feel no pressure to decide on sterilization because of the unavailability of alternative methods or lack of skill to provide them. Moreover, delayed VSC services should be available so that if the client is uncertain or there is a medical contraindication, the procedure can be comfortably scheduled at 4 weeks or later after delivery.

If the procedure is delayed beyond 4 weeks after delivery and the woman is not breastfeeding, advise her to use an effective contraceptive method until sterilization.

INFORMED CONSENT

Informed consent to undergo a surgical procedure is the voluntary decision made by a person who has been fully informed about the procedure and its consequences. Provide the information in a language the client can understand and include all the information listed in the local family planning or MCH policies and standards as well as in the BRAIDED mnemonic. (See the section on Counseling for Male and Female Sterilization.)

The client, along with the surgeon or an authorized representative, must always sign or mark the informed consent form. The authorized representative may be the person with the primary responsibility for counseling the client. Illiterate clients should mark the informed consent form with a thumbprint or "X"; a witness chosen by the client must also sign or mark the form. If possible, the witness should be of the same sex as the client.

VOLUNTARY SURGICAL CONTRACEPTION FOR WOMEN

MECHANISM OF ACTION

Sterilization for women involves mechanically blocking the fallopian tubes to prevent the sperm from reaching the egg.

EFFECTIVENESS

When standard techniques are used, sterilization has a lower risk of pregnancy than do most temporary contraceptive methods. Pregnancy rates for sterilization are similar to rates for some of the long-acting methods, such as implants, injections, and IUDs. Most studies of the common occlusion techniques—the Pomeroy and Parkland techniques, rings, clips, and electrocoagulation—have reported pregnancy rates of less than 1%.^{22,38} These rates, however, reflect only the first year or two after sterilization. In a recent study of more than 10,000 women, cumulative pregnancy rates exceeded 1% after 5 years and reached 1.8% after 10 years.²⁵ Sterilization failures may occur for any of five reasons:³⁵

1. The woman may be pregnant at the time of sterilization. This situation may be avoided if the sterilization is performed within the first 10 days of the menstrual cycle, if the patient uses an effective contraceptive until after the sterilization procedure, or if the patient abstains from intercourse following her last menses prior to sterilization.

2. Surgical error accounts for 30% to 50% of failures.²³ These errors can be reduced through better training of surgeons, taking good care of surgical instruments, and accurately identifying fallopian tubes.
3. Equipment failure can occur when laparoscopic methods are used.
4. Fistula formation occurs most commonly with the electrocoagulation method (this method was generally not used in Africa at the time this book was written).
5. Spontaneous re-anastomosis is related to the method of occlusion. Carefully using rings, clips, or standard ligation methods (Pomeroy or Parkland) will decrease the prevalence of these problems.

The 10-year follow-up of the unipolar and bipolar sterilization cases in the U.S. Collaborative Review of Sterilization (CREST) study found higher pregnancy rates with spring clip application and bipolar cautery than with unipolar cautery.²⁵ The higher pregnancy rates appeared to be related to surgeon training and to technical problems with the instrumentation, such as incorrect wattage.^{19,35} For well-trained surgeons, differences in effectiveness rates between occlusion techniques will probably not be important. However, some techniques vary in effectiveness depending upon when the woman is sterilized and which surgical approach is used. (See Occlusion Techniques under sections Providing Postpartum and Postabortion Surgical Contraception and Sterilization Interval Surgical.)

ADVANTAGES AND INDICATIONS

There are several advantages to female sterilization:

- The procedure is permanent.
- The pregnancy rate is low.
- The method is cost effective (when cost is spread over the remaining years of fertility).
- The patient has nothing to buy or remember.

- No significant long-term side effects occur.
- The partner does not need to cooperate.
- Lovemaking need not be interrupted.

Female sterilization is a safe operative procedure. In developing countries, reported fatality rates are about 4.7 per 100,000.¹⁸ In contrast, the maternal mortality rate in such countries is 630 deaths per 100,000 live births.³¹ Sterilization by minilaparotomy can be performed safely during the immediate postpartum period or in association with pregnancy termination, provided that the clients' medical status is adequately assessed.

Female sterilization is ideal for those persons who are certain they wish no further children and who need a reliable contraceptive method. It is also indicated for those in whom subsequent pregnancy may have an adverse effect on the woman's health.

DISADVANTAGES AND CAUTIONS

Female sterilization has several disadvantages as well:

- The procedure should be considered *permanent*.
- Techniques to reverse the sterilization are difficult and expensive.
- It does not protect against STIs.
- Sterilization procedures are technically difficult.
- The operative procedure requires a surgeon, an operating room (aseptic conditions), trained assistants, medications, and surgical equipment.
- The initial expense is high.
- The risk of ectopic pregnancy is high when sterilization fails.

PROVIDING INTERVAL STERILIZATION

The timing of female sterilization, whether pregnancy-related or not, is very important in choosing the surgical approach, method of occlusion, use of counseling, staff and facilities, and organization of patient flow. Surgical techniques for female sterilization include (1) ligation, in which a thread-like material is tied around the fallopian tubes, (2) mechanical occlusion with clips or rings to close the tubes, and (3) electrocoagulation (see Figure 21:1). The fallopian tubes are usually approached through the abdomen via a minilaparotomy incision or laparoscopy. A surgeon may also perform female sterilization at the time of a cesarean section or other abdominal surgery. Surgeons have generally abandoned an approach through the vagina via a colpotomy because of the increased risk of infection and pregnancy.

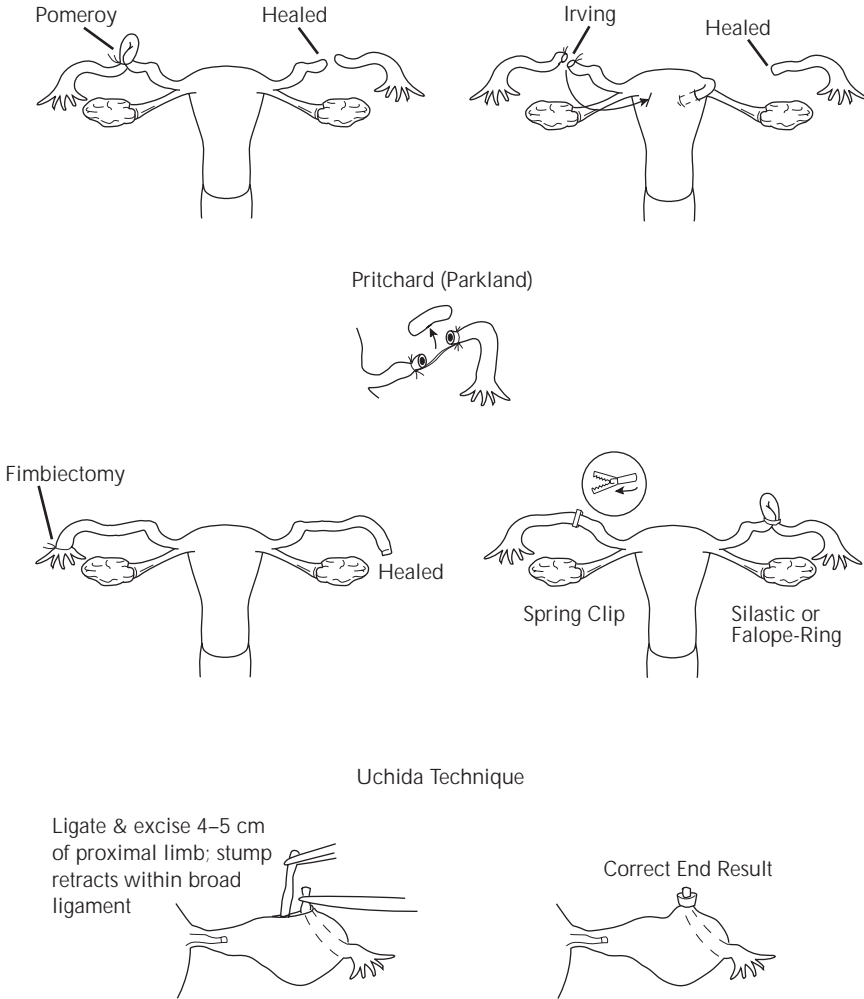
In the preoperative assessment, make sure the patient has been appropriately counseled and has consented to surgical sterilization. Ask about pelvic disease, previous abdominal or pelvic surgery, diabetes mellitus, heart or lung disease, bleeding problems, allergies, and recent infections. Determine the date of the last menstrual period. Make certain the woman is not pregnant. When sterilization is performed postpartum or after an abortion, make certain the client has no pregnancy-related problems and that she is not anemic. Order appropriate laboratory studies, which usually will include at least a hemoglobin measurement. Assess the patient's heart, lungs, abdomen, and her general condition. Perform a careful pelvic examination. Pay special attention to uterine position and mobility and whether the patient might have pelvic infection or masses.

Training manuals specific for Africa have been developed by the Association for Voluntary Surgical Contraception (AVSC) and are available upon request.³

Suprapubic Minilaparotomy

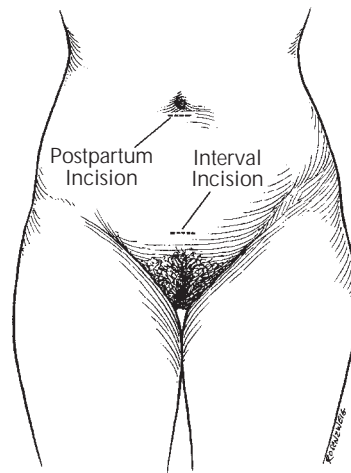
Suprapubic minilaparotomy for "interval sterilization" (at 4 or more weeks after delivery) is performed when the uterus is fully involuted. The surgeon makes an abdominal incision 2 to 5 cm in length, just at the pubic hairline (see Figure 21:2). When healed, the incision

Figure 21:1 Tubal sterilization techniques



lies within the hairline and is not visible. Using the minilaparotomy technique may be difficult if the woman is obese, if the uterus is immobile, or if the tubes have adhesions from infection or previous surgery. The pelvic organs must be mobile during the surgery so that the tubes can be moved into the incision site.

Figure 21:2 Incision site: postpartum and interval minilaparotomy



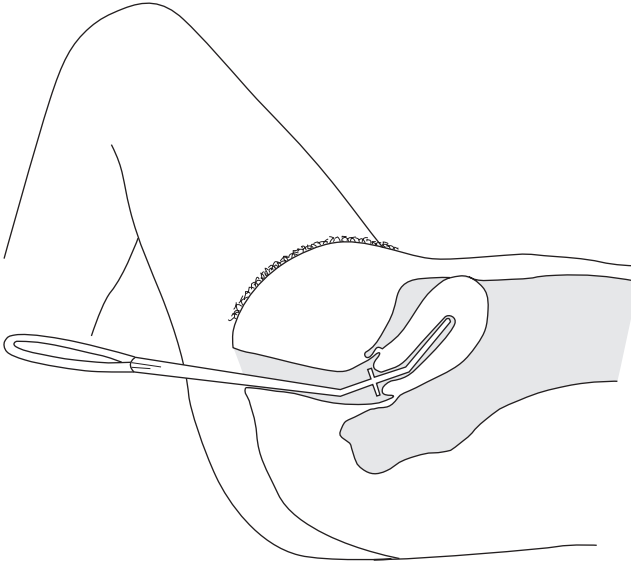
Source: Stewart et al. (1988)

Anesthesia. Light sedation using a local anesthesia can be given preoperatively to infiltrate layer by layer of tissue. When using local anesthesia, continue communicating with the woman during the procedure to enhance the analgesic effect, reassure her, and, when necessary, elicit her cooperation.

Procedure. The bladder should be emptied immediately before the operation. The surgical procedure is generally performed with the woman in a supine or a semilithotomy position. If the uterus is not already anteverted, elevate the uterus by hand or with a uterine manipulator (elevator) (see Figure 21:3).

In general, place the incision approximately 1 cm below the site at which the elevated uterine fundus hits the abdominal wall. If the incision is placed too high, the tubes will be difficult to reach. If it is placed too low, the bladder may be incised. Because anatomy varies from patient to patient, take great care in entering the abdomen. Locate the fimbria to confirm that you have found the fallopian tube and not the round ligament. If needed, use a tubal hook or small Babcock forceps to lift the fallopian tube from the abdomen. Surgical manipulation should be slow, gentle, and sensitive to the patient's complaints and responses. Avoid unnecessary trauma or manipulation.

Figure 21:3 A metal elevator raises the uterus and moves it from side to side so that the uterus and tubes will be closer to the incision



Source: Stewart et al. (1988)

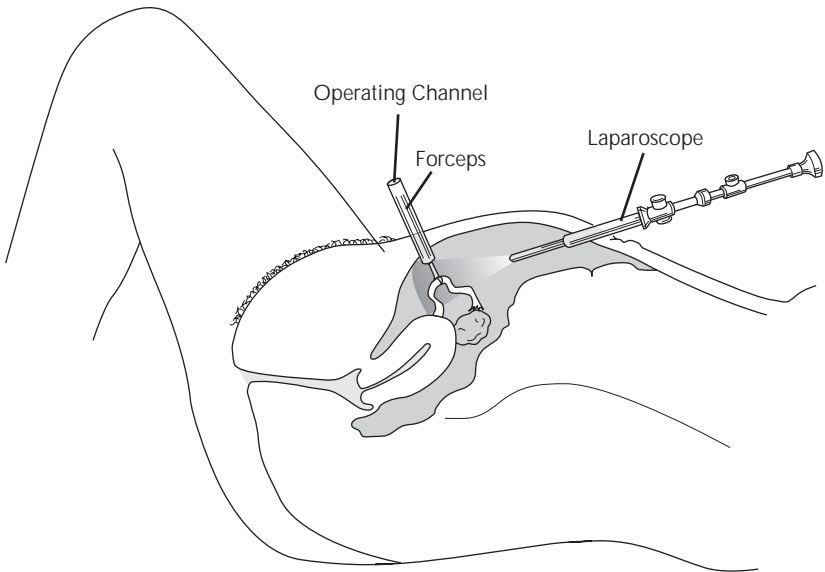
Occlusion techniques. The Pomeroy and Parkland techniques, Silastic rings, the Filshie clip, or spring clips can be used (the last two with special applicators). Fimbriectomy and the Madlener procedures have been associated with higher pregnancy rates and have no advantages over the Pomeroy and Parkland techniques for routine cases. The Pomeroy technique is the most widely used in Africa.

Closing. Use careful aseptic technique and obtain good hemostasis before closing the abdominal wound in layers. Growing evidence indicates it is unnecessary to suture the peritoneal layer, because small peritoneal defects will heal without adhesions.⁴⁴ This rule applies as well to postpartum subumbilical minilaparotomy.

Laparoscopy

The laparoscopic approach is used to place rings (bands), apply clips, or electrocoagulate the oviducts. A laparoscopy may be performed using either a single- or double-puncture technique. The second puncture is used to manipulate the organs and occlude the tubes (see Figure 21:4). With single-puncture laparoscopy, the operating instrument is passed through the laparoscope.

Figure 21:4 Laparoscopy



Laparoscopy is less painful than a minilaparotomy, has a lower rate of complications and a shorter operative and recovery time, and leaves only a small scar (the same equipment and skills can be used for endoscopic diagnostic procedures).

The disadvantages of laparoscopic sterilization include the need for a provider with specialized training, equipment that is more difficult to maintain than minilaparoscopy equipment, and a specially equipped operating room. Laparoscopic sterilization is not recommended for the immediate postpartum period.

Anesthesia. Laparoscopic sterilizations can be performed using local or general anesthesia. Local anesthesia with light sedation is usually adequate and offers safety advantages over general anesthesia, which can lead to compromised cardiorespiratory function.²⁶

Procedure. Clean the perineal area, vagina, and cervix and scrub the abdominal site with special emphasis on thoroughly cleaning the navel. The cervix may be stabilized with a laparoscopic instrument.

The insufflation needle should have a blunt obturator (as does the Verress needle). Verify correct placement by aspiration, hanging drop, or pressure test.⁴⁴ Keep equipment in good working order. Keep the trocar sharp.

After making a small subumbilical incision, place upward traction on the abdomen to insert the Verress needle for insufflation. Advance the needle toward the pelvis and away from the great blood vessels. Place the patient in the Trendelenburg position and insufflate 1 to 3 liters of gas (the minimum needed for good visualization), nitrous oxide (N₂O), carbon dioxide (CO₂), or room air. Withdraw the needle and insert the trocar, advancing it toward the pelvis and away from the great vessels as the abdominal wall is firmly elevated. Remove the trocar from its sleeve (cannula) and insert the laparoscope.

In double-puncture laparoscopy, the second puncture is made under direct vision through the laparoscope in the abdomen. In single-puncture laparoscopy, the operating instruments are inserted through the operating channel of the laparoscope to grasp and occlude the oviducts.

It is also possible to perform "open laparoscopy," in which the peritoneal cavity is opened under direct vision, an approach similar to that used in subumbilical minilaparotomy. A cannula is then placed and stabilized for insertion of the laparoscope. This method avoids blindly entering the abdomen with sharp instruments.¹² However, general use of open laparoscopy has gained little support because it takes longer than traditional laparoscopy and it remains to be shown that it is safer.

Occlusion techniques. Silastic bands, unipolar electrocoagulation, and Filshie clips appear to have similar short-term effectiveness rates when correctly applied, but the ectopic pregnancy rate appears to be higher with electrocoagulation (bipolar and unipolar) than with the bands or clips.³⁹

Clips are placed on the isthmic portion of the tube at 1 to 2 cm from the uterus. Silastic rings (bands) are placed 3 cm from the uterus. Because the spring clip has a lower force of compression than the Filshie clip, it requires precise placement at a 90-degree angle across the tube, with the isthmic portion of the tube positioned at the hinged part of the jaws to avoid failures. Electrocoagulation is applied in the midportion of the tube, away from other structures.⁴⁸ (See Figure 21:5.)

Figure 21:5 A laparoscopy instrument grasps one tube in preparation for coagulation or application of a ring or clip



Source: Stewart et al. (1988)

Closing. After both tubes are occluded, inspect the pelvic organs to ensure that no injury or bleeding has occurred. Under direct vision, remove the second puncture instruments, carefully expel all the gas, and remove the laparoscope and the cannula. When removing the cannula after all gas has been expelled, reinsert the laparoscope to the end of the cannula to prevent omentum or bowel from herniating into the abdominal wall defects as the cannula is removed.⁴⁴ Close the incision with sutures.

Vaginal Approach

The fallopian tubes can be reached and the pelvic organs directly visualized through a colpotomy, an incision high in the vagina (posterior to the cervix), or by using an endoscopic instrument called a culdoscope. However, vaginal approaches are less safe and less effective than minilaparotomy or laparoscopic approaches. Infection is more common, and the techniques are generally more difficult to learn and perform. Thus, the vaginal approach should be used only by a skilled surgeon familiar with the culdoscope.⁴⁴

Transcervical Approach

Most of the hysteroscopic techniques for injecting occlusive materials into the fallopian tubes are still experimental. These techniques are difficult to learn, equipment is expensive, and the success rates when they are used for sterilization have generally been disappointing.

Also considered experimental are nonsurgical sterilization techniques using a chemical or other material to occlude the tubes through the cervix. Several agents, including quinacrine, methyl cyanoacrylate, and phenol, have been used with varying success. Delivery systems are still being perfected to obtain higher levels of effectiveness.

Quinacrine pellets inserted high in the intrauterine cavity may cause nonsurgical sterilization. This method can be performed in any clinical setting equipped and staffed to insert an IUD. In one study, 73% of women had both tubes occluded after two insertions of quinacrine pellets; both tubes were occluded in 94% after three insertions.⁶ Researchers in Vietnam found this method to be safe and effective for female sterilization,¹³ but many professionals believe that current information does not warrant its use except in experimental conditions. In a significant number of clients, this method fails to occlude the fallopian tubes. However, some groups are encouraging the acceptance of the transcervical approach because it is simple, nonsurgical, and can be performed on an outpatient basis.

Hysterectomy

Hysterectomy, whether performed through the vagina or abdomen, carries a much higher risk of serious complications than other sterilization procedures. Thus it should only be performed for a gynecological disease or condition that justifies a hysterectomy, not solely for terminating fertility.

PROVIDING POSTPARTUM AND POSTABORTION SURGICAL CONTRACEPTION

Immediate postpartum VSC services can be an integral part of any maternity service. Postpartum VSC can be performed in a simple procedure room, a delivery suite, or an operating theater.

In many countries, the immediate postpartum period (within 48 hours of delivery) is the most common time to perform female sterilization. Postpartum VSC offers greater convenience to the client and provider, lower costs, greater ease of surgery, and more efficient use of health resources. Generally, the woman's health status can be assessed from the delivery and prenatal records.

Subumbilical Minilaparotomy

A woman who undergoes subumbilical minilaparotomy need not stay longer than she would for a normal delivery (24 hours or less in many hospitals). If a minilaparotomy is performed 10 or more hours after delivery, postpartum hemorrhage is unlikely to occur, because the uterus will be contracted and less likely to relax and, therefore, bleed. In addition, the baby can be observed and assessed more thoroughly prior to discharge.²⁹ (See Suprapubic Minilaparotomy for more on preoperative assessment.)

Anesthesia. Local anesthesia with light sedation is frequently sufficient, because several of the more painful aspects of minilaparotomy are reduced: the incision is smaller, and intra-abdominal manipulation of the tubes is less extensive. The patient lies quietly in the supine position, and there is no need for instruments in the vagina.

Procedure. For the first 2 days after delivery, the fundus of the uterus and fallopian tubes lie high in the abdomen. A small (1.5 to 3 cm) incision just below the umbilicus allows the surgeon to reach the tubes. The tubes are usually easier to reach if both the incision and the postpartum uterus are aligned with each other.

When a minilaparotomy is not feasible, a laparotomy (defined as an incision longer than 5 cm) may be performed, usually with general, spinal, or epidural anesthesia. Laparotomy incisions cause more complications, and the associated anesthesia methods increase the risk and prolong recovery times. (The laparoscope is not used in the immediate postpartum period because of the risk of injury to the large, vascular uterus. Laparoscopic occlusion methods are not appropriate because the oviducts are edematous and vascular and thus larger.)

Occlusion techniques. Figure 21:1 illustrates several occlusion techniques. The Pomeroy technique, using plain catgut, is an effective, safe approach in the immediate postpartum period. In the midportion of the fallopian tube, create a loop of tube. Close the loop by ligating with plain catgut suture material. Cut the loop to separate the tube.

The Parkland technique avoids bringing the cut ends together and preserves more of the tube. Perforate the mesosalpinx in an avascular area. Ligate the tube in two places with chromic one-zero catgut, and excise the intervening segment of tube.^{23,29}

Use of the Hulka clip in the postpartum period has been shown to compare favorably with the modified Pomeroy tubal ligation because of its simplicity and greater potential reversibility.²¹ The Filshie clip and the spring clip are not designed for use postpartum and are, therefore, generally not recommended for postpartum sterilization.¹⁶ Electrocoagulation is also not recommended, because it is usually delivered via laparoscopy and appears to be associated with an increased risk of fistula formation and ectopic pregnancy.

Fimbriectomy, sometimes performed because the ampullar and fimbrial portions of the tubes are more accessible than the isthmic and ampullar portions, has fallen from favor. It has high pregnancy rates and a higher frequency of postoperative complications. Fimbriectomy is also less reversible and removes more tissue.

Cesarean Section

Tubal occlusion can be easily accomplished during cesarean section. However, because of the greater risks involved with cesarean section, health care providers should be discouraged from performing a cesarean section rather than attempting a vaginal delivery just because tubal ligation is planned.

The Pomeroy technique has a slightly higher pregnancy rate when performed at the time of a cesarean section than an interval procedure; the lack of surgical skill may be a reason. The Parkland technique is also commonly used during a cesarean section. The Irving technique (which requires a wide surgical exposure for implanting the proximal end of the tube into the uterine wall and is thus possible with cesarean section) is one of the most effective methods of occluding the tubes and is unlikely to permit an ectopic pregnancy.²⁹

Postabortion VSC

Tubal occlusion via a minilaparotomy or laparoscopy may be performed immediately after a first-trimester spontaneous or medically induced abortion as long as the patient receives careful counseling. Note that the tubes will be edematous. (See Minilaparotomy Complications and Laparoscopy Complications.)

Occlusion techniques. The Pomeroy or Parkland procedures may be used for occlusion. Silastic rings and spring clips are less likely to fail when used in the postabortion period than when used in the immediate postpartum period.

ANESTHESIA

General anesthesia is usually unnecessary for most female VSC procedures, and its risks far outweigh its benefits. If general anesthesia is used, it must be provided by trained personnel in appropriate settings. A discussion of general anesthesia is beyond the scope of this text.

Local anesthesia with light sedation is the preferred way of providing pain relief. Do not compromise the normal physiological control of vital functions. Avoid high doses of opioid (narcotic) analgesics and benzodiazepine (tranquilizer) sedatives that can compromise ventilation, sometimes dramatically, and may cause cardiovascular depression.

Monitor vital signs regularly both during and after the operation until the patient is fully recovered and alert.

The following is a sample regimen for local anesthesia for minilaparotomy. It is also suitable for laparoscopy with some modifications as noted (doses given are for an average adult body weight of 50 kg).

Premedication

Sedate the patient with 10 mg of diazepam 30 to 60 minutes before the operation. Midazolam, a new short-acting parenteral benzodiazepine that is three to four times more potent than diazepam, may be substituted. Give 2.5 to 3 mg midazolam intramuscularly 1 hour preoperatively or 1 to 2.5 mg intravenously in the operating room. Cost may limit the use of midazolam.

Cautionary notes on the use of narcotics and other analgesics

- Their onset is rapid but not instantaneous
- Therefore, they should be given incrementally (in small repeated doses) while the client is being observed
- Reversal agents (Narcan or other appropriate reversal agents) should be immediately available.

Given in the Operating Room

Atropine. Give 0.4 to 0.6 mg intravenously.

Meperidine (Pethidine). Five 50 mg intravenously. Other opioid analgesics or ketamine can be substituted for meperidine. Comparable doses of analgesia are given in Table 21:1.⁴⁴

Table 21:1 Analgesia substitutes for meperidine

Drug	Intravenous dose	Analgesic duration
meperidine (Pethidine)	50 mg	2-3 hours
fentanyl (Sublimaze)	0.05-0.06 mg	30-60 minutes
pentazocine (Talwin)	15-20 mg*	3-4 hours
butorphanol (Stadol)	1 mg	3-4 hours
ketamine (Ketalar)	25-30 mg*	10-15 minutes

*Short acting: supplemental doses about one-third less than the initial ketamine dose may be given at 10-minute intervals.

Promethazine (Phenergan). Give 25 mg intravenously.

Lidocaine local anesthesia. Infiltrate the skin and subcutaneous tissues with 10 to 15 ml of 1% lidocaine (lignocaine) without epinephrine. After the peritoneal cavity is opened, drip 5 ml of 1% lidocaine onto each tube and the uterus. During laparoscopy this step is optional if the instrument does not permit lidocaine application. During double-puncture laparoscopy, the second site will also be infiltrated. The maximum safe dose of 1% lidocaine (without epinephrine) is 5 mg/kg body weight. For example, for a woman weighing 50 kg the maximum safe dose is 250 mg or 25 ml of 1% lidocaine. If only 2% lidocaine is available, dilute it to 1% with 0.9% sodium chloride only so that you can better obtain adequate volume for local infiltration and avoid exceeding the safe dose. Some surgeons use sodium bicarbonate (1 cc of 8.4% sodium bicarbonate [standard vial percentage] with 25 cc of 1% lidocaine) to decrease the burning sensation caused by the anesthesia infiltrating into the subcutaneous space.

MANAGING PROBLEMS AND FOLLOW-UP

Its low rate of complications (0.4% to 1%) makes female sterilization quite desirable. Complications include wound infections, hematoma, perforation of the uterus with the elevating instrument, bladder injury, and sterilization failure. Most of these complications

can be prevented by careful screening, using local anesthesia with sedation, careful monitoring of vital signs, asepsis, and careful surgical technique. The seriousness of complications can often be minimized if they are recognized early and managed aggressively.

Anesthesia Complications

Anesthesia-related complications can be aggravated if the abdomen is filled with gas or is in the Trendelenburg position, especially if general anesthesia is used. Most complications arising from anesthesia occur acutely.

Surgical Complications

Because the abdominal wall is thin at the umbilicus, proceed cautiously when dissecting and entering the peritoneal cavity to avoid cutting the intestine. Handle the tubes gently to avoid profuse bleeding from the engorged postpartum vessels. Postoperative hemorrhage can occur if ligatures around the tubes are not secure enough to prevent slipping. Reduce the risk of infections by screening clients preoperatively and by avoiding surgery on patients who have had prolonged rupture of membranes with evidence of current infections (with fever).

Prophylactic antibiotics are usually given if the procedure is performed on the third and seventh postpartum day. If the procedure cannot be performed within 7 days after delivery, wait until 4 to 6 weeks postpartum, because the oviducts are usually difficult to reach in the interim.^{29,44}

Minilaparotomy Complications

Minilaparotomy procedures may have the following complications:

Wound infection. As with all surgical procedures, careful aseptic technique, proper skin preparation, proper sterilization of instruments and proper technique in the operating room, as well as good postoperative wound care by the client, decrease the risk of wound infections.

Uterine perforation with uterine elevator. Reduce trauma by applying all instruments gently. Carefully determine the position of the uterus before inserting the elevator.

Bladder injury. This common surgical complication occurs because the bladder is close to the lower incision. Dissect carefully and pay attention to landmarks.

Intestinal injury. Take care to identify tissue layers when entering into the abdominal cavity. Serious complications can result from an unrecognized injury.

Laparoscopy Complications

The overall mortality rate for laparoscopic sterilization is 2.9 deaths per 100,000, well below the rate for minilaparotomy of 5.9 deaths per 100,000 procedures.¹⁸ The rate of laparoscopic complications depends heavily on the surgeon's skill. The surgeon needs special training in laparoscopy.

Complications such as mesosalpingeal tears and transection of the tube can occur with ring application, and may require laparotomy to control bleeding. Sometimes an additional ring can be placed on each severed end of the tube to gain hemostasis. Uterine perforation with the uterine elevator can usually be managed conservatively. Injuries to vessels, intestines, or other organs can occur with the insufflation needle or the trocar. Make sure general anesthesia is available to manage the rare complication of severe bleeding from a major vessel.

Bowel burns can occur from electrocoagulation and lead to perforation and peritonitis. Most international agencies discontinued support for electrocoagulation equipment in the early 1980s. Most laparoscopic injuries, however, are not related to the coagulation but to use of the trocar or other surgical instruments.²⁰

Long-term Complications

Ectopic pregnancy. *Ectopic pregnancy should be ruled out any time a woman shows signs of pregnancy following tubal occlusion.* Ectopic

pregnancies can occur 6 or more years after sterilization. Ectopic pregnancy is most often related to (1) uteroperitoneal fistula after unipolar electrocoagulation; (2) inadequate coagulation or recanalization after bipolar procedures; or (3) recanalization or fistula formation after the Pomeroy, clip, or ring procedure.⁴²

Among nonsterilized women, 0.5% to 1% of pregnancies are ectopic; the comparable percentages for sterilized women range from 4% to 73%, depending on the procedure used.²³ One survey found that 16% of pregnancies following the clip procedure were ectopic; 38% after the ring, 73% after unipolar occlusion, 59% after bipolar occlusion, and 44% after Pomeroy occlusion.¹⁶ Electrocoagulation has a threefold greater incidence of ectopic pregnancy than does the use of the Silastic ring.

Hormonal changes. Several investigators have suggested that serum progesterone may decline following tubal occlusion; other investigators have reached different conclusions. No studies have evaluated pre-sterilization and post-sterilization levels of this hormone.¹⁵ Levels of luteinizing hormone, follicle stimulating hormone, testosterone, and estrogen remain within the normal range.

Menstrual patterns and other changes. A specific, describable pattern of bleeding after sterilization has not been convincingly demonstrated.²⁸ Further research needs to be conducted.

Psychological problems have not been identified more often in sterilized than in nonsterilized women.⁴⁵ A study on the effect of tubal sterilization and vasectomy on female marital sexuality found not only that these procedures have no detrimental long-term effects, but also that sterilized women have intercourse more frequently.³³

Hysterectomy and dilation and curettage. In one study, women who were sterilized at age 20 to 29 years were at greater long-term risk of having a hysterectomy.³⁶ Hysterectomies and dilation and curettage (D&C) are sometimes performed because of the mistaken belief that sterilization procedures lead to hormonal and menstrual changes.

SAMPLE INSTRUCTIONS FOR THE FEMALE CLIENT

PREOPERATIVE INSTRUCTIONS

1. You must be certain you understand and desire a permanent method of birth control. You can change your mind at any time before the procedure or can postpone the operation if you need more time to decide.
2. Shower or bathe just before surgery. Carefully clean around the umbilicus (navel) and the pubic hair.
3. Do not eat or drink in the 8 hours before surgery.
4. Have someone be with you on the day of surgery, on your way home, and during the first 24 hours following surgery.
5. Ask questions if you have them.
6. Plan a flexible schedule for the week after the sterilization.
7. Be prepared for pain over the incision and occasional pelvic aching or discomfort. The pain is usually not severe and can be relieved with mild pain medications.
8. Remember that this method of birth control is permanent. Reversal surgery is generally not available in Africa.

POSTOPERATIVE INSTRUCTIONS

1. Rest for 24 hours following surgery. Resume normal activities as you gradually become more comfortable.
2. Avoid intercourse for 1 week and stop if it is uncomfortable.
3. Avoid strenuous lifting for 1 week to allow the incisions to heal.
4. Take 1 or 2 analgesic tablets at 4- to 6-hour intervals if you need them for pain (do not use aspirin as it may promote bleeding).
5. You may bathe 48 hours after surgery but avoid putting tension on the incision and do not rub or irritate the incision for 1 week. Dry the incision site after bathing.

6. Stitches will dissolve and do not require removal. (Note to provider: this instruction must be modified if nonabsorbable sutures, such as silk, are used.)
7. Return to the clinic 1 week after the procedure to make sure healing is normal.
8. At any time in the future, if you think you are pregnant, return to the clinic immediately. Although pregnancy after female surgical contraception is rare, when it does occur, chances are increased that it will be outside the uterus (an ectopic pregnancy). **This is a dangerous, life-threatening condition and must be treated immediately.**
9. Return to the clinic or contact the clinic or doctor promptly if you develop the following signs:

Danger Signs After the Operation

Caution

- Fever (greater than 39° C)
- Dizziness with fainting
- Abdominal pain that is persistent or increasing
- Bleeding or fluid coming from the incision
- Suspicion of pregnancy—you must be seen immediately

-
10. If you may be at risk for infection with the virus that causes AIDS (human immunodeficiency virus, or HIV) or any other sexually transmitted infection, continue to use condoms.

No matter what other methods of contraception a woman is using, if she is at any risk because her partner tests HIV positive or because she does not know her partner's HIV status, she should be advised to use plastic or latex condoms with every sexual act.

No other contraceptive method besides abstinence provides the same degree of protection.

VOLUNTARY SURGICAL CONTRACEPTION FOR MEN

MECHANISM OF ACTION

Vasectomy blocks the vasa deferentia and thus prevents the passage of sperm into the semen.

EFFECTIVENESS

Although vasectomy is not completely foolproof, it is the most effective contraceptive method for men. The likelihood of operative failure is reduced if the surgeon has performed the procedure frequently.³⁴ Failure is usually discovered when examination of the semen indicates the presence of sperm more than 4 to 6 weeks after the operation or after 10 to 12 ejaculations.⁵

ADVANTAGES AND INDICATIONS

Vasectomy is a simpler, safer, and less expensive procedure than female surgical contraception. Vasectomy offers several advantages:

- It is highly effective.
- It is very safe.
- The procedure can be performed quickly.
- The effects are permanent.
- The costs are low in the long run.
- Most clients find vasectomy highly acceptable.

DISADVANTAGES AND CAUTIONS

Vasectomy has disadvantages as well:

- It requires surgical training, aseptic conditions, medications, and technical assistance.
- It does not protect against STIs, including HIV.

- Vasectomy is permanent. Although reversal is possible, it is expensive, and requires a highly technical and major surgery for which success cannot be guaranteed.
- About 5% to 10% of patients regret having the procedure.
- Costs are high in the short term.

Short-term disadvantages. Vasectomy is not effective until the ejaculate is free of sperm. Complications such as bleeding or infection, although infrequent, do occur.

Long-term effects. About one-half to two-thirds of men will develop sperm antibodies following vasectomy. However, having these antibodies does not appear to lead to any complications.^{22,27} Extensive studies have found no increase in heart disease or other adverse effects following vasectomy.⁴¹

One study, however, showed a slightly increased risk of cancer in men who had been sterilized for 20 or more years.⁸ Other studies have found a weak positive association between vasectomy and prostate cancer;^{9,10} epidemiological studies on this relationship have conflicted. The Final Statement from the 1993 Vasectomy and Prostate Cancer Conference concludes: "Because the results of research to date on vasectomy and prostate cancer are inconsistent, and associations that have been found are weak, there is insufficient basis for recommending a change in clinical and public health practice at this time. In light of this:

- Providers should continue to offer vasectomy and to perform the procedure.
- Vasectomy reversal is not warranted to prevent prostate cancer.
- Screening for prostate cancer should not be any different for men who have had a vasectomy than for those who have not."⁴⁰

PROVIDING MALE STERILIZATION

Technical guidelines on providing vasectomy services have been developed by the World Health Organization.⁴⁶ These guidelines should be followed closely.

Ask the patient about his past illnesses and surgeries, bleeding disorders, allergies (particularly to local anesthetics and pain medications), heart disease, kidney and bladder infection, diabetes, anemia, and STIs. Evaluate his general health condition. Measure his pulse and blood pressure; check for infections in the scrotal or inguinal area and for a hernia or previous surgery in the inguinal area. Evaluate the scrotum for hydrocele, varicocele, and proper descent of the testicles. Examine the scrotal skin and subcutaneous tissues. Laboratory examinations are not routinely performed but should be available.

Vasectomy

Clip the man's hair from his scrotum and around his penis. Just before surgery, wash the area with soap and water. Prepare the scrotum, thighs, and perineum with an effective antiseptic (usually a water-based iodine or 4% chlorhexidine solution). Use sterile technique. Anchor the vasa (two tubular structures, one in each side of the scrotum) with an atraumatic instrument or your fingers. Incise the skin and muscle overlying the vas or open these with the "no scalpel" method (see section on No-Scalpel Vasectomy). Through this small puncture, isolate and occlude the vas (see Figure 21:6). Perform the same procedure on the vas on the other side.

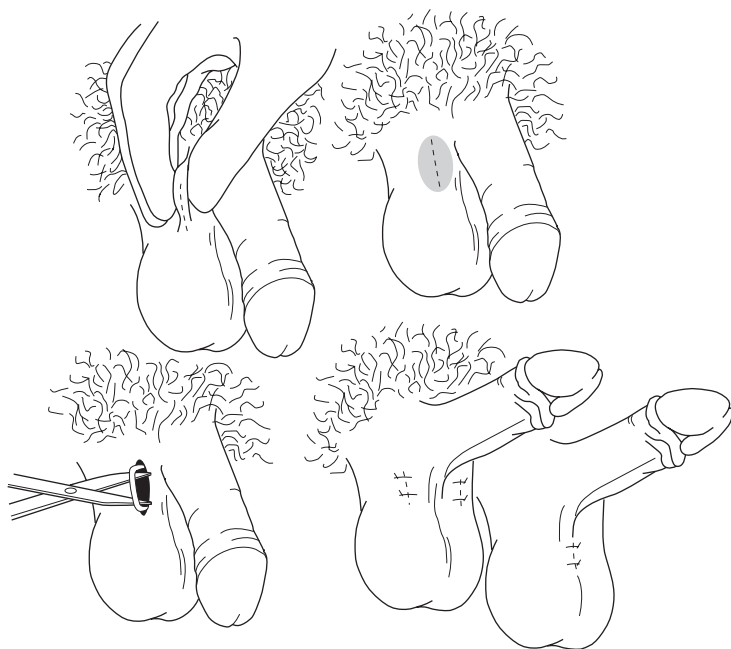
Anesthesia. Infiltrate 1% lidocaine (lignocaine) without epinephrine into the area to be incised and then deeply into the perivascular tissue.

Occlusion techniques. Place a simple ligature using absorbable or nonabsorbable suture on each end of the cut vas. Be careful not to cut through the vas with the suture. A segment of the vas may be removed to obtain greater separation, but this step is not necessary. A fascial barrier may be created between the ends by drawing the sheath over one end and suturing it;^{1,44} this technique may decrease the failure rate.

Sperm granulomas occur more often at the cut ends after the ligation technique, possibly contributing to a somewhat higher failure rate than when fulguration is used. A recent modification is to leave the testicular end of the vas open ("open-ended vasectomy") and fulgurate the abdominal end to a depth of 1.5 cm. A fascial barrier may then be interposed. This method appears to reduce the frequency of postoperative congestive epididymitis without increasing the rate of painful sperm granulomas.^{1,7,44} Some surgeons report increased failure rates with this approach, but open-ended vasectomy may reduce postoperative complaints. Success rates for reversal may also be higher than when both ends are fulgurated.

Closing. Close the incisions with absorbable suture. Many surgeons use only a single midline puncture and do not suture small skin incisions.^{1,14,44} If possible, the patient should rest 15 minutes or longer before he leaves.

Figure 21:6 Sites of vasectomy incisions



Source: Hatcher et al. (1983)

No-Scalpel Vasectomy

A new, refined "no-scalpel" procedure has been introduced and is currently being used in many programs around the world.² It is the standard vasectomy technique in China, where more than nine million men have had the procedure,¹¹ and it is rapidly becoming the procedure of choice in Thailand, India, and Indonesia.³⁷

The vasa are approached through a puncture in the scrotum rather than through a scalpel incision,² but, thereafter, the surgical procedure is the same as the scalpel method. However, there may be fewer bleeding complications with the no-scalpel method than when the scalpel is used. If these rates are indeed lower, anxiety about producing a postsurgical hematoma might be reduced.¹⁴

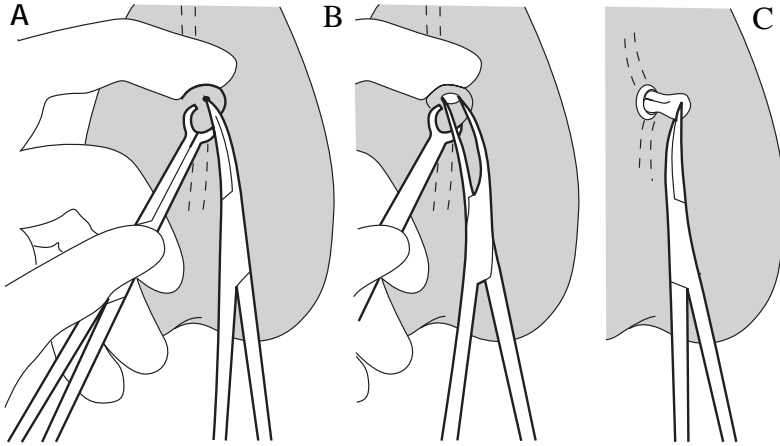
The procedure uses two unique instruments: a specially designed ring forceps and a sharp-tipped dissection forceps. After injecting local anesthetic, encircle and secure the vas with the ring forceps. With the sharp-tipped dissecting forceps, puncture and stretch a small opening in the skin and vas sheath. Lift out the vas and occlude it as you do with other vasectomy techniques. Use the same midline puncture site to deliver and occlude the other vas in an almost bloodless procedure. No sutures are needed to close the small wound (see Figure 21:7).

MANAGING PROBLEMS AND FOLLOW-UP

Mortality is extremely rare (about 1 death per 300,000 procedures) when asepsis and surgical skills meet basic standards.³⁰ Complications following surgery are also rare (see Table 21:2). Careful surgical technique and keeping the patient from strenuous activity for a day or two reduces bleeding complications. Prevent hematomas by controlling any bleeding during the operation. Manage small, non-infected hematomas with rest and analgesics. Large, painful, or infected hematomas usually require surgical drainage.

Prevent infections by using strict aseptic practices and sterilized equipment. Have the patient keep the incision clean. If an infection does occur, treat it with antibiotics and apply wet heat frequently.

Figure 21:7 "No-scalpel vasectomy." The vas (dotted line) is grasped by special ring forceps and the skin and the vas sheath are pierced by sharp-tipped dissecting forceps (A). The forceps then stretch an opening (B) and the vas is lifted out (C).



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Source: Hatcher et al. (1983)

Leakage of sperm from the occluded end of the vas can cause an inflammatory nodule (granuloma) that generally subsides spontaneously, although pain medication may be required. The rare granuloma that increases in size, is painful, and does not recede may be treated surgically. Congestive epididymitis may occur due to back pressure in the occluded vas. With heat treatment and scrotal support, the condition usually subsides in a week.

Table 21:2 Medical complications of vasectomy

Complication	Percentage of procedures (n=24,961)
Hematoma	1.6
Infection	1.5
Epididymitis	1.4
Granuloma	0.3
Failure	0.4

Source: Wortman (1976)

SAMPLE INSTRUCTIONS FOR THE MALE CLIENT

Preoperative Instructions

1. Remember that a vasectomy is permanent. You can change your mind at any time before the operation. Reversal surgery is generally not available in Africa.
2. Before surgery, use scissors to cut hair around the penis and scrotum to approximately 1/4 inch in length.
3. Shower or bathe. Wash your penis and scrotum thoroughly to remove all loose hairs.
4. If possible, have someone go home with you when you have the procedure done. Do not ride a bicycle, walk long distances, or do anything that may rub or put pressure on the scrotum.

Postoperative Instructions

1. Following the surgery, return home and rest for about 2 or 3 days, after which you may resume your normal activities.
2. Avoid strenuous physical exercise for 1 week. Strenuous exercise means hard physical exertion or lifting or straining that could bring pressure to the groin or scrotum.
3. Do not shower or bathe for the first 2 days after the vasectomy.
4. The stitches will dissolve and do not have to be removed. (Note to provider: this instruction must be modified if nonabsorbable skin sutures, such as silk, are used or if no skin sutures are used.)
5. You may resume sexual intercourse after 2 or 3 days if you think it would be comfortable. Remember, you are not sterile immediately. For many men, sperm will not be cleared from the tubes until after about 12 ejaculations. Until then, use condoms or another method of birth control to prevent pregnancy. The best way of finding out whether you are sterile is to have the doctor look at your semen under a microscope after you have ejaculated 12 times.

6. If you have pain or discomfort, simple pain-relieving medications taken every 4 to 6 hours usually give adequate relief. (Note to provider: name and dose should be specified.)

7. It is important for you to know what signs are normal or abnormal following your surgery. You will probably have some pain and swelling in the scrotal region; the scrotum may be somewhat discolored. These effects are normal and should not worry you. Occasionally, blood from a tiny blood vessel may escape into the scrotum at the time of surgery, and bleeding may continue. Notify your clinic if you have any of the following danger signals or if you notice any other unusual body changes. (See Danger Signs below.)

Danger Signs After the Operation

Caution

- Fever
- Bleeding or pus from the site of the incision
- Increasing pain or swelling

For any of these problems, you must return to the clinic for medical care without delay.

8. If you may be at risk for infection with the virus that causes AIDS (the human immunodeficiency virus, or HIV) or any other sexually transmitted infection, continue to use condoms.

REVERSAL OF FEMALE AND MALE STERILIZATION

Voluntary surgical contraception should be considered permanent, but even with careful counseling, some women and men will request reversal following a divorce, a remarriage, or a child's death or if they desire more children. The following points should be emphasized:

- Reversal is generally not available in Africa.
- Reversal requires major surgery and special skills.

- Some clients are not appropriate candidates because of the way the sterilization was performed, because of the client or partner's advanced age, or because of the infertility of the spouse.
- Success cannot be guaranteed, even when the patient is a good candidate and the surgery is performed by an experienced microsurgeon.
- Reversal surgery is very expensive for both male and female clients.

In addition, the candidate should understand that anesthesia and major abdominal or scrotal surgery carry a risk of complications. There is also a risk of ectopic pregnancy after reversal of female sterilization: the rate is about 5% for women who have an electrocoagulation procedure reversed and about 2% for women who have other occlusion techniques reversed.²³

If the woman wishes to proceed after counseling, a laparoscopy is usually done to determine the condition of the tubes, and infertility tests may be performed for her and her husband. Most surgeons will not operate if less than 4 cm of healthy tube remains.

SUCCESS RATES FOR REVERSAL OF FEMALE STERILIZATION

With ligation or mechanical occlusion of the tube, careful microsurgical techniques can reverse the sterilization procedure in 50% to 70% of cases. This high success rate, however, reflects reports from experts who have operated on selected patients. Success rates calculated by the number of intrauterine pregnancies after reversal surgery are highest for occlusion techniques that damage the smallest segment of oviduct (see Table 21:3).²³

Table 21:3 Tubal damage and reversal pregnancy rate by tubal occlusion method

Technique	Tubal damage (cm)	Reversal pregnancy rate (%)
Clip	1	88
Thermal cautery	2	Unknown
Ring	3	75
Pomeroy	3-4	59
Electrocoagulation	3-6	43

Sources: Huber (1988) and Liskin (1985)

Good success rates are generally achieved through the use of microsurgical techniques that require special training and combine several features, including the following:

- Use of magnification (loupe, hood, or operating microscope)
- Accurate alignment of the fallopian tube segments and placement of sutures
- Constant irrigation of tissues to prevent drying
- Use of very fine suture and needles
- Bipolar microsurgical electrocautery to minimize bleeding
- Care to keep foreign materials from being left in the wound

SUCCESS RATES FOR REVERSAL OF VASECTOMY

Microsurgical technique is important when restoring continuity of the vas. An operating microscope using higher magnification (25 power) is usually employed. Under these circumstances, reported pregnancy rates range from 16% to 79%, with most rates approaching 50% or above. Higher proportions of men have sperm in the ejaculate, however, with rates ranging from 81% to 98%. Clinicians should not present these high rates as measuring the success of reversal, however, as pregnancy, not the presence of sperm, is the desired outcome.

The pregnancy success rate can depend on several factors, including the skill of the surgeon or microsurgeon. Several factors may reduce chances of success:

- Increased time since the vasectomy was performed⁴
- Presence of antisperm antibodies
- Advanced age of the wife
- Characteristics of the vasectomy that was performed (a long segment of vas removed, it was performed near the epididymis, or cauterly was used)

Attempts to develop a plug, valve, or simple reversible vasectomy have not been successful.²² Men must accept vasectomy as a permanent procedure even though improved microsurgical techniques have increased the chances of restoring fertility.

POLICY AND LEGAL ISSUES

Family planning programs in many African countries are making good progress in providing sterilization. However, appropriate national authorities need to establish clear guidelines that allow the procedures to be available to deserving clients. Policies that include quotas, coercive incentives, "camps," and other similar programmatic concepts are not acceptable in promoting voluntary surgical contraception.

Establishing policies for providing sterilization to retarded women and men and determining the legal status of such procedures remain problems. Health care providers, policy makers, and local leaders should discuss the ethical and legal issues involved in providing voluntary sterilization to those who may not be able to provide informed consent.

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Postabortion Care: Treating Complications and Providing Contraception

When she discovered that she was pregnant, 24-year-old Fatamatu felt she could not have another child so soon after the birth of her previous baby. "The baby is still too young. I have to support that child and my mother on my small income. My husband has moved to the Forest Region to live with his second wife." Fatamatu wanted to go to a hospital or a doctor but could not afford to do so. A friend told Fatamatu about a woman who performed abortions. This woman inserted a rubber catheter into Fatamatu's cervix and told her to go home. When she saw blood, Fatamata was to pull out the catheter and the products of conception would follow on their own.

Fatamatu began bleeding heavily and felt faint and feverish. She returned to the practitioner's home, who was away caring for a sick relative in a distant village. Fatamatu's friend took her to the city hospital. A physician found retained tissue in the uterus and some trauma to the cervix. That afternoon he performed a manual vacuum aspiration procedure and gave her antibiotics. Fatamatu remained in the hospital for a few hours. She was prescribed oral antibiotics and was advised to rest for one week. One of the nurses discussed contraceptive options with her. Fatamatu decided to use the hormonal injection that she could obtain at a family planning clinic near her home.¹

Most family planning providers will at some time be faced with treating the potentially lethal complications of an unsafe abortion performed on a desperate woman. These complications represent some of the few emergencies encountered by family planning providers. The provider who manages this encounter well can save a life and enlist a woman in the regular use of effective contraception. No matter the provider's attitudes on abortion, these women need care, and they need it immediately.

Unsafe abortion is one of the five leading causes of maternal mortality worldwide.^{4,8} Each year, between 30 and 40 million induced abortions are performed throughout the world, and as many as 200,000 women die following the procedure.²² From 10% to more than 50% of maternal deaths in Africa have been attributed to complications from induced abortion.^{15-17,22} Abortion is legally restricted in most African countries, but some countries, notably Zambia, Ghana, Botswana, and Tunisia, have a more liberal policy.

Even in countries where abortion is illegal, many clinicians feel morally obligated to treat women with abortion complications and provide them with postabortion family planning. The 1994 Conference on Population and Development in Cairo, Egypt, concluded that "in all cases women should have access to quality services for the management of complications arising from abortion. Post-abortion counseling, education, and family planning services should be offered promptly which will also help to avoid repeat abortions."

Women seek induced abortion for medical, economic, or personal reasons. Africa has exceptionally high rates of unplanned pregnancies because many women lack access to family planning services and because the prevalence of contraceptive use is low.¹¹ Induced abortion in Africa is most common among young, unmarried, and unemployed women who are of low parity or are childless.^{1,11,18} Abortion also often occurs among women who have achieved their desired family size or simply cannot afford the economic burden of an additional child. In some cases, rape or medical reasons lead women to seek abortion. From 5% to 15% of all pregnancies end in spontaneous abortion (miscarriage);²⁰ the percentage may be even higher in areas where many women are undernourished or have generally poor health.

Most unsafe abortions in Africa are performed outside of a clinical setting, usually because legal abortion is not available, somewhat less often because there are not enough health practitioners trained in performing induced abortion or because their services are too expensive. Unsafe abortion is characterized by inadequate provider skills, hazardous techniques, and unsanitary facilities²¹ in which the procedure becomes a serious threat to the health and well-being of the patient. The woman herself or a traditional practitioner may attempt to terminate the pregnancy by inserting foreign bodies or instruments through the cervix into the uterus or by the woman ingesting modern medicines or traditional herbs.¹⁶

POSTABORTION COMPLICATIONS

Many factors increase the risk of complications from abortion:

- Unhygienic techniques and practices used to initiate the abortion
- A long interval between initiating the abortion and receiving post-abortion care
- Limited provider skill
- Insufficient patient information
- Inadequate examination of tissue
- Poor or nonexistent aftercare
- The woman's poor health
- The abortion was performed late in the pregnancy
- Presence of gonorrhea or other pelvic infection

The signs and symptoms associated with complications from an unsafe abortion include vaginal bleeding, fever, septicemia, abdominal pain, cramping, foul-smelling vaginal discharge, and anemia.^{8,13} Complications following abortion include retained pregnancy tissue, infection, bleeding, hemorrhage, septic shock, anemia, intra-abdominal injury (including uterine perforation), cervical or bowel damage, and toxic reactions to chemicals or drugs used to induce abortion. These

complications may lead to long-term medical problems such as chronic pelvic infection, which increases the risk of ectopic pregnancy and infertility.¹⁹

Some of the early signs of an ectopic pregnancy may be similar to the signs of abortion complications. A woman with an ectopic pregnancy may have pain, irregular bleeding, breast tenderness, nausea, or a recently delayed or skipped menstrual period.

Clinicians who treat abortion complications should be careful not to express disapproval or harsh judgment of the woman on the basis of her resorting to unsafe abortion, being sexually active, being young or unmarried, not using contraception, using contraception ineffectively, or not wanting to have the baby.

MANAGING INCOMPLETE ABORTION

Incomplete abortion occurs when a pregnant woman has begun to abort, either spontaneously or by induction, but has not yet expelled all the products of conception. There are several signs of retained tissue:

- Abdominal or pelvic pain
- Backache or cramps
- Heavy or persistent bleeding, with or without clots, that may lead to shock (rapid pulse, sweaty or clammy skin, fainting or lightheadedness)
- Enlarged, soft, tender uterus noted on pelvic exam
- Tissue visible at cervical os (opening)

Manual vacuum aspiration (MVA) is the treatment of choice for a nonseptic incomplete abortion where uterine size is equivalent to 12-week or less gestation.⁹ Vacuum aspiration involves using a syringe directly connected to a cannula to empty the uterus. The World Health Organization (WHO) says that vacuum aspiration is an essential element of obstetric care at the first referral level.^{9,21} Numerous studies have found MVA to be safer, more effective, and less expensive than sharp curettage (SC), which is still used in many parts of the

world.^{6,8,14} MVA is less expensive than SC, as it usually does not require heavy sedation or an overnight hospital stay and, therefore, uses fewer hospital resources.^{3,8} The Kenyatta National Hospital in Nairobi estimated a savings of US \$300,000 during the first year it used MVA to manage incomplete abortions—hospital stays were shorter and there were fewer complications.¹⁶

MVA requires a hand-held vacuum syringe and flexible plastic cannula, which may be used as a combined sound and dilator. The syringe, which is portable, not electric, and either single- or double-valve, produces a vacuum as effective as that produced by an electric aspirator.⁸ It can be used for endometrial biopsy, treatment of incomplete abortion, and first-trimester abortion or menstrual regulation. When an incomplete abortion is suspected, conduct a medical history, and perform both a general physical exam and a pelvic exam. Assess the uterine size by a bimanual exam and compare the actual size to that expected from menstrual dates. The uterus is likely to be smaller than would be expected because of the partial expulsion of products of conception.⁹

Prepare the patient before performing the procedure by following these steps: (1) have the patient empty her bladder, (2) place her in the lithotomy position, (3) allow sufficient time for any premedication to take effect, ensuring that supportive communication continues throughout the procedure, (4) drape the patient, and (5) prepare the vacuum in the syringe.

The following steps for treating incomplete abortion are taken from the International Population Assistance Services (IPAS) Manual Vacuum Aspiration Guide for Clinicians.²²

1. Through a speculum inserted in the vagina, hold the cervix steady with a tenaculum and gently apply traction to straighten the cervical canal. Administer paracervical block, if needed.
2. Dilate the cervix (as required). Cervical dilation is necessary when the cervical canal will not allow passage of a cannula appropriate to the uterine size. When required, dilation should be done gently with mechanical dilators or with cannulae of progressively increasing size. Avoid causing trauma to the cervix or creating a false passage.

3. While holding the cervix steady, insert the cannula gently through the cervix into the uterine cavity just past the internal os. Rotating the cannula with gentle pressure often helps ease insertion.
4. Push the cannula slowly into the uterine cavity until it touches the fundus. Note the uterine depth by the dots visible on the cannula. The dot nearest the tip of the cannula is 6 cm from the tip, and the other dots are at 1-cm intervals. After measuring the uterine size, withdraw the cannula slightly.
5. Attach the prepared syringe (vacuum established) to the cannula, holding the end of the cannula in one hand and the syringe in the other. Make sure the cannula does not move forward into the uterus as you attach the syringe.
6. Release the pinch valve on the syringe to transfer the vacuum through the cannula to the uterus. Bloody tissue and bubbles should begin to flow through the cannula into the syringe.
7. Evacuate the contents of the uterus by moving the cannula gently and slowly back and forth within the uterine cavity. Rotate the syringe as you do so.
8. Check for signs of completion. This procedure is usually quicker than dilation and curettage (D&C) and is complete when red or pink foam and no more tissue is seen in the cannula, a gritty sensation is felt as the cannula passes over the surface of the evacuated uterus, and the uterus contracts around (grips) the cannula. Withdraw the cannula and detach the syringe.
9. IPAS instruments are labeled for single use in the United States. However, reuse of syringes may be permitted in some situations. Since the syringe does not come in direct contact with the patient, decontamination and disinfection are sufficient. To decontaminate, remove the instruments from the patient while you are still wearing gloves. Draw the decontaminating solution (0.5% chlorine solution is recommended) through the cannula into the syringe and drop the soiled instruments into the chlorine solution. Allow the items to soak for at least 10 minutes. Then, disinfect with chemical disinfection soak (low to mid-level disinfection is adequate), following the disinfectant manufac-

turer's instructions. Do not try to disinfect the syringe with heat, because the valve assembly will crack.

Uterine evacuation is occasionally followed by an accumulation of blood clots in the uterus after surgery. This condition (postabortion syndrome, or hematometra) can develop rapidly, causing severe cramping pain that worsens within the first few hours after vacuum aspiration. Examination shows a large, tense uterus that is very tender with little or no bleeding at the cervix. In this situation, remove the retained tissue or blood clots with repeat vacuum aspiration or D&C. Consider giving methylergonovine (Ergometrine) or other oxytocics to help maintain firm uterine muscle tone and to expel any remaining tissue or clots.

MANAGING OTHER ABORTION COMPLICATIONS

INFECTION

Infection often develops with retained pregnancy tissue because the tissue is an ideal environment for bacterial growth. There are several signs of infection:

- Pain in the abdomen or pelvis
- Cramping or backache
- Fever and chills
- Foul-smelling vaginal discharge
- Tenderness of the uterus and adnexa

Teach patients to watch for these signs and to seek help immediately if any occur. Most often, signs of an infection appear 2 to 3 days after the abortion, but the infection can begin earlier or as much as several weeks later. If you suspect unsafe attempts to terminate the pregnancy or a long delay in seeking postabortion care, make a presumptive diagnosis of infection even in the absence of clinical signs. In these cases, begin antibiotic treatment immediately.

A patient needs urgent hospital care if she is severely ill, weak, has low blood pressure (shock), or has an infection that extends beyond the uterus to involve the fallopian tubes (parametritis or salpingitis) or

abdominal cavity (peritonitis). Evacuate the uterus of retained pregnancy tissue as soon as possible. Give the patient intravenous antibiotics and fluids immediately and continue until she improves (has no fever for at least 24 hours, for example) and is able to change to oral treatment. If a hospital is far away, give antibiotics intramuscularly or orally until the patient arrives at the hospital for intravenous administration.

If the infection is mild (involving only the uterus) and there is no evidence of tissue remaining in the uterus, hospitalization may not be necessary. Give the patient oral antibiotics and advise her to rest at home. If she has improved satisfactorily within 2 or 3 days (she has less pain, less uterine tenderness, and no fever), evacuation of the uterus may not be necessary. However, if her symptoms persist or worsen, or if her uterus is tender or enlarged, uterine evacuation may be needed to ensure that no tissue remains in the uterus.

BLEEDING

Some bleeding is to be expected after treatment of either a spontaneous or an induced abortion. Bleeding is often scant (or absent) for the first 24 to 36 hours, then increases somewhat as the uterine lining loses the hormonal support of pregnancy. Moderate bleeding, similar to a menstrual period, may continue intermittently for as long as 6 weeks.

Evaluate bleeding that is heavier than a normal menstrual period or that continues regularly for more than 3 or 4 weeks. Heavy bleeding may be caused by retained pregnancy tissue or by trauma to the cervix, vagina, or uterus from instruments or chemicals. Some anesthetics, such as halothane, may also cause immediate uterine hemorrhage because they interfere with normal uterine contraction. Prolonged bleeding may indicate retained pregnancy tissue.

Hemorrhage can also be caused by a disruption in the normal blood-clotting sequence. This problem (disseminated intravascular coagulopathy, or DIC) is rare but sometimes occurs when an abortion is missed or a dead fetus remains in the uterus for days or weeks before

spontaneous uterine contractions begin. DIC may occur with severe infection or may be triggered by an instillation of a hyperosmolar agent.

Initial treatment for hemorrhage, such as repairing a cervical tear or removing retained tissue, is often successful. If bleeding is very heavy or the patient shows signs of shock (rapid pulse, decreasing blood pressure, weakness, or faintness), begin massaging the uterus to maintain firm muscle tone. Administer oxytocics or ergometrine and ensure that arrangements are made for further care, such as intravenous fluids, blood transfusion, and surgery.

DAMAGE TO THE CERVIX, UTERUS, OR VISCERA

Damage to the vagina, cervix, and uterus is a serious problem, especially after unsafe abortion or when abortion is self-induced. These injuries may be discovered only during the uterine evacuation. Uterine perforation and intra-abdominal injury, including damage to intestines, can result from an attempt to insert a foreign body (such as a stick) into the uterus. Damage to the cervix or uterus is much less common during the course of a vacuum aspiration abortion, but it can occur. More commonly, tears of the cervix are caused by the clamp (tenaculum) used to stabilize it during surgery. Vaginal injuries can also occur if caustic chemicals, such as harsh soap or potassium permanganate, are used.

A rapid pulse, weakness, faintness, or decreasing blood pressure may be a warning that serious internal bleeding is occurring, possibly as a result of damage to the large uterine blood vessels in the broad ligaments adjacent to the uterus. Pain, vomiting, abdominal tenderness or rigidity, and decreased bowel sounds may be signs of intestinal injury.

If you detect injuries, immediately discontinue the aspiration. Further management depends upon whether the aspiration is complete. If the uterus is perforated by a sharp instrument or by the vacuum curette, surgery may be required.

TOXIC REACTIONS TO DRUGS OR CHEMICALS

Women who have attempted to induce abortion using drugs and herbal preparations may show signs of poisoning, including kidney and liver damage. Collect and measure urine to check for kidney damage. Signs of liver damage include upper abdominal pain and jaundice. Clinicians also may suspect attempted abortion if the vagina shows ulceration or bleeding from caustic chemicals.

Some women who ingest ergonovine, chloroquine, or quinine to induce abortion end up taking toxic amounts. Ergonovine poisoning can cause vomiting, diarrhea, thirst, itching, numbness, and tingling of the extremities, and can lead to confusion, cold skin, a rapid weak pulse, unconsciousness, and even death (the lethal dose is 26 mg by mouth).⁵ Chloroquine poisoning causes headache, disturbances in vision, gastrointestinal upset, itching, and, in some cases, rash. Toxic doses of quinine cause stomach pain, nausea, vomiting, diarrhea, ringing in the ears, dizziness, and vision disturbances. Severe central nervous system effects of quinine poisoning include headache, fever, confusion, delirium, faintness, depressed respiration, coma, and death (the lethal dose is 8 gm by mouth).⁵ Aspirin is not an effective medication for abortion and can cause toxicity and hard-to-control bleeding.

POSTABORTION CONTRACEPTION

Induced abortion, whenever it occurs, indicates an unwanted pregnancy. This immediate postabortion period is an ideal time to discuss contraceptive options and to understand why the unwanted pregnancy occurred. Counseling can help the woman avoid repeating the experience of unwanted pregnancy and abortion. Tell the woman that ovulation will return soon after an abortion and that she can become pregnant again before her next menses. If she wants to become pregnant soon, provide information or referral for reproductive health services. If she does not want to become pregnant soon, educate her about all the contraceptive methods available and help her make an informed decision. Use the following guidelines:

1. If there are no complications after the abortion, recommend that the woman abstain from intercourse until the bleeding stops, then use any effective contraceptive method as soon as she resumes intercourse.
2. After a second-trimester abortion or if the genital tract has been traumatized or infected, the best contraceptive methods to recommend are oral contraceptives, injectables, and condoms and a spermicide. Hormonal implants can also be recommended, but they are not available in all parts of Africa. Female sterilization and an intrauterine device (IUD) are *not* recommended at this time. The diaphragm or the cervical cap should not be used until 6 weeks following the abortion or until any infection or trauma has healed.
3. If there has been hemorrhage that has led to severe anemia, the most appropriate contraceptive methods to recommend are oral contraceptives, condoms and spermicides, or a progestin-releasing IUD (if available). Female sterilization, inert or copper-bearing IUDs, implants, and injectables are *not* recommended until the severe anemia is resolved. However, temporary anemia related to blood loss usually subsides very quickly.
4. Although it is difficult to make a decision about long-term contraception in emergency settings,^{2,12,20,21} this is an ideal time for patients to receive counseling and information about various methods. For couples who want no more children, the postabortion period may provide a convenient time for the male partner to proceed with sterilization. The woman can recover from her abortion at the same time her partner recovers from his vasectomy, after which the couple may resume intercourse.
5. In all cases, discuss the importance of condoms for protection from sexually transmitted infections (STIs), including the human immunodeficiency virus (HIV). Condoms should be readily available to all clients, regardless of the chosen birth control method.

WHAT CLINICIANS CAN DO

Clinicians who provide reproductive health care will almost surely be asked to evaluate or treat women who are having or have recently had an abortion, either spontaneous or induced. To reduce complications and mortality from abortion, clinicians are called upon to do the following:

1. Improve the availability of comprehensive, high-quality reproductive health care services, including contraceptive information and services. Effective contraception can prevent the occurrence of future abortions and their complications.
2. Provide supportive and nonjudgmental counseling about the pregnancy termination. Abortion can cause tremendous emotional and physical distress for women. They deserve to be treated with dignity and compassion.
3. Providers, particularly at the primary and first referral levels of care, must receive training in preventing maternal mortality and morbidity from abortion complications. Increase access to affordable and safe abortion services that use appropriate and simple technologies such as the MVA. Recognize and manage the medical complications of unsafe abortion so that problems can be identified and treated early.
4. Encourage active education and involvement of local women's groups in issues of reproductive health, including sexuality, fertility, contraception, STI prevention, and abortion.^{7,9,16,23}

Danger Signs After Treatment of Abortion

Caution

- Fever
- Chills
- Muscle aches
- Tiredness
- Abdominal pain, cramping, or backache
- Tenderness in the abdomen in response to pressure
- Prolonged or heavy bleeding
- Foul-smelling vaginal discharge
- Delay (6 weeks or more) in resuming menstrual periods

If any of these signs are present, seek medical care.

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Education and Counseling

"I came to the clinic for an injection. No one told me that Depo-Provera might cause changes in my monthly bleeding. It was a frightening experience because I didn't know what was happening. After it was explained to me that nothing was wrong, I felt much more comfortable."

Almost all family planning clients need information about child spacing and birth control methods. Many have questions. Nearly all will need instructions on how to use their selected method of contraception. Teaching facts and skills to your clients is called education.

Some clients also need counseling, which involves exploring the client's emotions and helping her solve problems. Women may need counseling on how to encourage their partners to accept family planning. If a woman has a sexually transmitted infection (STI) or an abnormal laboratory test, she will need counseling to help her manage the situation and decide what to do.

Good education and counseling require good communication. How the provider talks to the client can sometimes mean the difference between whether the client is a successful user of family planning or an unsuccessful one. The important elements communication should cover during a family planning visit may be remembered by the word GATHER²:

-
- G** Greet clients in a friendly and helpful way
 - A** Ask clients about their family planning needs
 - T** Tell clients about available family planning methods
 - H** Help clients decide which method they want
 - E** Explain how to use the method chosen*
 - R** Return visits should be planned
-

*(see the BRAIDED list later in this chapter)

In addition to following these general suggestions, the provider should remember the following definitions:

- *Education*—The skills and knowledge family planning clients need to make informed decisions and to use their chosen contraceptive methods successfully. Teaching about specific contraceptive methods should include the basic elements described in the word BRAIDED, which is discussed later in this chapter.
- *Counseling*—The help clients need to overcome obstacles posed by lifestyle, life situations such as a partner who is not supportive, or fears grounded in misconceptions.

PRINCIPLES OF EDUCATION

In many parts of Africa, few women are formally educated beyond the early grades. Thus, few women know much about anatomy, the reproductive cycle, or the facts of family planning. Clients generally already have some information about family planning methods that they obtain from family and friends or from their own experience. Their information may be accurate, or it may be dangerously wrong. The provider's responsibilities include helping correct inaccurate information, which is often based on popular myths about contraception.

The following principles, which are based on ways in which adults learn, can be useful in the family planning clinic:

- Allow time for the client to discuss her questions and concerns. Some clients need a lot of encouragement to ask questions.
- Involve the client actively. The client learns from what she does, not from what the provider does. Have her touch and handle birth control methods; role play, if necessary. Make sure the client understands by asking her to repeat the directions in her own words.
- Teach with stories and examples. Abstract ideas are grasped more easily when presented in a human context. For example, compare two couples, one using birth control and the other experiencing an accidental pregnancy. Use simple hand puppets to act out small dramas.
- Be gentle in manner and technique. People learn best when they feel safe and calm. A person coming for a medical examination rarely feels safe and calm.
- Anxiety and disappointment interfere with learning. People who learn they are pregnant when they do not want to be, have a sexually transmitted infection (STI), or are worried about some aspect of their health often say they remember little you say beyond hearing their test result is "positive" or "negative."
- The average person understands and remembers about three messages at one time. Think about the few most important facts the client must know and teach her those. Almost no client can learn *all* she needs to know in one visit. Invite her for a group session; provide take-home materials she can understand; schedule another visit if needed. (See Table 23:1.)

Remember:

- First things first. What's most important?
- Keep it simple. Use words clients understand.
- Keep it short. Do not confuse the client with too much information.

- Be specific. Do not say "Take your pills on time." Instead say "Take your pills every morning after breakfast or pick another time that is better for you."
- Say it again. Repeat the most important instructions.
- Give factual, unbiased information about the various birth control methods. The word BRAIDED can help you remember what to talk about when you teach clients about *specific* methods:³

- B** Benefits of the method
- R** Risks of the method (both major risks and all common minor ones), including consequences of method failure
- A** Alternatives to the method (including abstinence and no method)
- I** Inquiries about the method are the client's right and responsibility
- D** Decision to withdraw from using the method without penalty is the client's right
- E** Explanation of the method is owed the client
- D** Documentation that the provider has covered each of the previous six points

Table 23:1 Education programs in family planning settings

-
- Teach group classes
 - Educate and counsel individual clients
 - Present 10- to 20-minute audiovisual programs
 - Display posters
 - Hand out materials (written and pictorial)
 - Set up libraries and reading areas
 - Demonstrate the use of birth control methods on life-like models
 - Evaluate client learning through question and answer sessions
-

Consult Chapter 11 on the Essentials of Contraception for summaries of important information you can use in discussions with clients about the advantages and disadvantages of contraceptive methods and instructions for using them.

PRINCIPLES OF COUNSELING

Family planning decisions often come from the heart. How to select when to have a baby, how many children to have, and what contraceptive method to use are often emotional choices. Clients facing family planning decisions may have intense feelings of anger, anxiety, fear, disappointment, or even joy. Although the provider can offer facts to help the client choose, the provider must also acknowledge and discuss the client's feelings as well.

Determine what each client is feeling about the things you are discussing.⁵ For example, say "Yes, you are pregnant. Can you tell me how this news feels to you?"

- Do not make decisions for the client. The best response to "What do you think I should do?" is "What do you think? I will help you think about the positive and negative issues."
- Listen. Often, clients need to be understood more than they need anything else.
- Open-ended questions uncover more about the client than closed questions that need only a yes or no response.
- Avoid asking "why" questions. "Why" questions are usually difficult or impossible to answer. Clients can feel threatened by having to answer "why."
- Help preserve hope, even in the face of a terrible illness such as the acquired immunodeficiency syndrome (AIDS).
- Be honest.

Cultural values and ideas learned in childhood strongly influence each person. Cultures vary widely in their attitude toward reproductive lives. Care providers need to know the cultural values of the client population and should learn, for example:⁹

- The ideal family size
- Who makes sexual decisions
- The typical marriage age
- How the culture understands the causation of unintended pregnancy or illness
- Who the powerful healers are
- What the client considers safe to tell the care provider
- How the husband (or wife) will respond to your care
- Whether the cultural communication style is direct or indirect or formal or informal

Balance your understanding of each client's unique personality with an awareness of and respect for influential cultural values and characteristics.

At the family planning clinic, Mrs. K asked for some way to give her space and a rest between pregnancies. She had not asked her husband for permission. However, he learned of her actions and said he would divorce her if she continued using contraception. She stopped and soon became pregnant.

In many cultures, women often are not given the authority to make the decision to practice family planning. In sub-Saharan Africa, there are still many women who do not seek more children but who do not use contraception because they believe their husbands oppose it.¹ (See Chapter 11 on Essentials of Contraception.) However, more than half of women who report their husbands disapprove of family planning have never even discussed family planning with them.¹ These women need to know how to initiate nonthreatening discussions with their husbands, then select methods that would suit the couple's relationship.

Conversely, men need education about the benefits of family planning. They need to learn that modern contraception will not harm them, their wives, or their children. In some cases, providers will need special help in dealing with husbands, such as when a woman

faces serious consequences from her husband if she makes family planning decisions on her own. A village leader or wise man, a religious leader, a respected elder, or a relative may help by talking with the husband and helping him understand the benefits of a planned family. (See Chapter 1 on the Benefits of Family Planning.) Situations in which a client's spouse is opposed to family planning are difficult for both the client and the provider. Solutions are more likely found if the providers can gain the support of their clients' communities.

PRINCIPLES OF BEHAVIOR CHANGE

Not all clients are equally ready to undertake changes in their daily lives that will promote their personal health, such as abstaining from sex or using condoms when there is a risk of STI, stopping smoking, or taking birth control pills. However, the health care provider can help the client move along a continuum, progressing from no change to little to moderate to complete change. Because change is incremental, interventions must be tailored to the client's particular position along a continuum of change.⁶ Scientists have described five steps along the behavior change continuum,^{7,8} which are detailed in Table 23:2.

In individual counseling, asking one or two questions ("What are you doing to protect yourself from accidental pregnancy?" "When would you like to become pregnant?") can help place the client along the stages of change continuum. Then, you can use the limited time available for education more effectively.

People change behaviors as a result of acquiring a new skill more often than as a result of gaining new knowledge. In teaching new skills, adapt the intervention to the client's own readiness for change.

Setbacks are common with any attempt to change human behavior. Clients whose behaviors slip back to an earlier level will need extra help with renewed (and perhaps re-thought) goal setting, a boost in self-esteem, and sympathetic understanding.

Table 23:2 Stages of change and educational interventions

Stage	Characteristics	Typical response to “What do you do to protect yourself from AIDS?”	How to focus educational intervention
Precontemplative	Not aware of risk, denies risk, no plan to change	“Who me?”	Teach risk awareness facts, show models of desired behavior
Contemplative	Thinking about change, no specific plans	“I’ve been thinking about that myself”	Assist with priority-setting, teach skills required for change, promote self-efficacy, (“You can think for yourself.”)
Ready for action	Has a plan, some action steps	“I checked out condoms in the drugstore the other day. There must be 30 brands!”	Assist with personal goals, reinforce skills, promote self-efficacy
Action	Change has begun, change is new	“From now on, no sex without condoms! Got them here in my pack!”	Reinforce personal goals, promote self-efficacy, show models of desired behavior
Maintenance	Change is in place, change is sustained	“I haven’t had sex without condoms in a year now.”	Praise success, promote self-efficacy, show models of desired behavior

Sources: O’Reilly and Higgins (1991); Prochaska and DiClemente (1983); Prochaska and DiClemente (1984)

REACHING CLIENTS

Because many African women have only limited reading skills, educational materials need to be designed that will be suitable for such an audience. Educational materials can be made more interesting, relevant, and motivating if they use stories, especially because Africa has a great tradition of storytelling.

In print materials, the text should use simple words, short sentences, and as many pictures as needed to communicate the message. Print materials in many forms are appropriate, such as pamphlets, flyers, letters, posters, and newspapers.

For many women, the spoken word is more effective. Classes, group meetings, or messages given during entertainment can get the information across. A number of nations have found that radio broadcasts are very helpful in reaching both women and men. Although rural populations are often targeted, people who live in urban areas also can benefit from radio broadcasts. Examples of radio dramas broadcast in four African countries are presented in Table 23:3.

Table 23:3 Main characters and plots of radio dramas in four countries

Program	Main characters	Plot
"Akumwera Nechekuchera" (Zimbabwe)	Jonasi Musekiwa and his two wives; Herija, Jonasi's best friend and coworker; Mbasera, a city friend of Jonasi's; and Chigwande, a rural health worker.	Jonasi, who works in the city, struggles to support his 15 children home in the village. Herija encourages Jonasi's spendthrift ways and extra-marital affairs, while Mbasera urges him to be more responsible.
"Ezi na Uno" (Nigeria)	Emeka and Nneka, a married couple satisfied with four children; Emeka's mother; and Obiageli, the woman Emeka's mother wanted him to marry.	Emeka's mother demands more grandchildren, and Obiageli (already the mother of seven, but with marital difficulties) tries to win Emeka back by offering to bear him children.
"Fakube Jarra" (Gambia)	Fakube Jarra, a local wise man; Fa Abdou and Mba Kujay, a monogamous couple with three daughters; Jainaba, Fa Abdou's widowed sister; and Fa Mamodou and Mba Hawa, a polygamous couple with six sons.	Jainaba and Fa Mamodou both have difficulty supporting their families but try to convince Fa Abdou that he should have more children. Fa Abdou seeks advice from Fakube.
"Family Affair" (Ghana)	Obo and his two wives, Adodo and Kawe; Adodo's mother; and GideeGidee, a witch masquerading as a traditional healer.	Kawe tries to introduce modern hygiene into the household, but jealous Adodo and her mother assume Kawe's motive is to monopolize Obo's attention.

Source: Lettenmaier (1993)

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Clinical Implications of Management Decisions

A woman visited a rural family planning clinic for the fifth time to get pills. The first time she received just one cycle of pills; each of the four succeeding visits she was given three cycles of pills. It took her 3 hours in each direction to come to the clinic and 30 minutes to an hour to get her pills. Each clinic visit cost her a day away from her field, making life just a bit more difficult for her. But she loved knowing that she couldn't get pregnant, so she returned. She never returned for her sixth pill visit, because her child was injured the day before the appointed date. Caring for him kept her from returning for the next 3 weeks. Without contraceptive protection, she became pregnant. The pregnancy was in her tubes. She died during the 3-hour trip to the hospital.

Reproductive health care is probably burdened with more laws, rules, biases, and administrative policies than any other area of medicine. Each administrative ruling, regulation, or protocol can act as a major barrier to the provision of high-quality services. For example, a provider may be limited to dispensing only one to three packages of oral contraceptives (OCs) at a single visit, even though a woman is far more likely to continue to take OCs if she can get a year supply of pills at a time.

Medical practice is dramatically influenced by administrative decisions made because of national laws, decisions made by a ministry of health or a regional health board, and medical policies established for a local clinic or even by an individual physician. Administrative decisions affect not only the services provided but the patient's choice and successful use of contraceptives. The motivation behind these administrative decisions and policies is often religious, political, social, or economic and does not always take into consideration the quality of the services provided each client. Family planning providers can be caught in the middle between the administrative decisions and their personal, professional interpretation of what is needed to provide high-quality services. Providers may confront serious dilemmas when forced to choose between compromising the quality of care by adhering to a short-sighted policy and endangering professional relationships by circumventing the policy.

Thus, it is important that providers play an active role in developing national service policies, norms, and procedures. In general, policies state the philosophy guiding family planning services and set forth rules and regulations. Norms, or standards, specify the minimally acceptable levels of performance expected of the providers. Procedure guidelines, or protocols, detail the step-by-step instructions for performing clinical tasks.

Examples of some of the administrative questions that might affect the clinical management of patients are presented in Table 24:1. Apply these questions to your own program and keep in mind the following important questions:

- What was the reason for this policy?
- What was the original intent of this policy?
- What is the impact of the policy on the client and the quality of services?
- What policy changes need to occur and how?

Reproductive health care providers must be responsive to the needs of the client. The goal is to provide safe, effective services in a manner acceptable to the clients. Reproductive health care providers must evaluate their programs' policies and the effect these policies have on the health care provided. Some of the administrative decisions providers should consider, the possible impact of these decisions on the clients, and current recommended practices are presented in Table 24:2. This table is arranged to correspond to the policy questions posed in Table 24:1.

Around the world, reproductive health decisions made by individual clients and their providers are strongly influenced by the legal, social, economic, and religious milieu of the place where they are made. If providers want to change medical practice to improve the health of individual clients, they must first examine the policies that affect their clients and their own practice of reproductive care (both the individual program's policies and the country's laws or policies that govern reproductive health care). They must review the guidelines in their national reproductive health programs to make sure they maximize both access to and the quality of family planning services. They must then move out into the legislative arena, religious institutions, the media, and the field of public health to bring about new or modified laws and regulations that permit the practices they deem best for individuals and couples.

Table 24:1 Service delivery policies, norms, and procedures

What are your program's service delivery policies, norms, and procedures?

Intrauterine devices (IUDs)

- ◆ Must a woman be menstruating to have an IUD inserted?
- ◆ Are uterine sounds available?
- ◆ Are antibiotics available to treat pelvic infections, and are they available in sufficient quantity? Are staff trained to handle infections?
- ◆ Is the levonorgestrel IUD available for clinicians?
- ◆ Is a policy in effect directing clinicians to remove the Copper T 380A after 3, 4, 5, or 6 years?

Oral contraceptives (pills)

- ◆ Must oral contraceptives be prescribed by a physician?
- ◆ Must new pill clients have a pelvic exam before beginning pills? Are Pap smears mandatory for all pill clients?
- ◆ How many packages of pills may a woman obtain initially? For resupply? After using the pill for a year?
- ◆ Are clients required to wait until the first postpartum menstrual period to begin oral contraceptives?
- ◆ Can nonsmoking women 35 years and older without cardiovascular risks be provided combined birth control pills?

Emergency (postcoital) contraceptives

- ◆ Are emergency contraceptive pills available for the 72 hours following unprotected intercourse?
- ◆ Is information about the availability of emergency contraception part of the standard for delivering family planning service?
- ◆ Is the Copper T 380A inserted as an emergency postcoital contraceptive in the 5 days following unprotected intercourse?

Table 24:1 Service delivery policies, norms, and procedures
(Continued)

Sterilization

- ◆ How are the surgeons paid who perform sterilization procedures (per procedure, per session, or per hour)?
- ◆ Must husbands or partners sign an authorization form for their wives or partners to obtain a tubal ligation?
- ◆ Is there adequate operating room time for performing tubal ligations?
- ◆ Are there rules indicating how many children a woman must have and what age she must be before she can have a tubal ligation?

Barrier methods

- ◆ How many condoms can be given to a woman or a man at a single visit?
- ◆ Can people obtain condoms without providing their names?

Injectables or implants

- ◆ Are Norplant implants and Depo-Provera available and accessible at all clinic sites?
- ◆ Are nurses or physician assistants trained to insert and to remove Norplant implants?

Sexually transmitted infections (STIs)

- ◆ Do you routinely offer to screen women for infection with the human immunodeficiency virus (HIV) and other STIs?
- ◆ Do you routinely take a sexual history to determine the need for STI testing?
- ◆ Is a microscope available to clinicians who perform pelvic examinations?

Table 24:1 Service delivery policies, norms, and procedures
(Continued)

Adolescent clients

- ◆ Are adolescents encouraged to consider abstinence as an option?
- ◆ Does the program permit providing contraceptives to unmarried or single women? Unmarried men? Must an unmarried adolescent have parental consent in order to receive contraceptives?
- ◆ Must an adolescent have a pelvic exam before getting pills?
- ◆ Must an adolescent female have established regular periods before being given the pill?
- ◆ Does your program have separate hours or facilities and trained providers to serve adolescents?
- ◆ Is emergency contraception offered to adolescents?

Clinic management

- ◆ Are appointments in the clinic made on a first-come, first-served basis?
- ◆ Can a woman with an emergency be seen by a provider immediately?
- ◆ Is your clinic open on weekends or in the evening?
- ◆ Does the form used for the documentation of a contraceptive visit ask questions about the frequency of intercourse, number of sexual partners, age of first intercourse, and history of STIs?
- ◆ Must a chaperone be present in the examination room for both male and female examiners?
- ◆ Does the clinic provide privacy to the client during interviews and during the physical exam?
- ◆ Do the providers speak the same language as the clients?
- ◆ Are providers paid differential incentives for the provision of different methods?
- ◆ Is there a steady, dependable flow of contraceptives and supplies from the central depot to the clinic or provider?
- ◆ Must husbands sign a consent form for their wives to receive family planning services?
- ◆ Can clients receive resupplies quickly, or must they wait with clients coming for other services?

Table 24:2 Administrative decisions and their impact on the client/patient

Administrative decision	Impact on client/patient	Recommended practices/policies
Intrauterine devices (IUDs)		
<p>A woman must be menstruating to have an IUD inserted. The policy applies to all women, including women who have not had sexual intercourse in the recent past, postpartum women, and women who have traveled long distances.</p>	<p>Insertion of IUD may be unnecessarily delayed and extra visits and pelvic exams required. It may be inconvenient, uncomfortable, or impossible for a woman to return to a clinic during her menstrual period.</p>	<p>Permit IUD insertion for nonmenstruating women or if she:</p> <ul style="list-style-type: none"> • is parturient and has not had intercourse since delivery • is postpartum and all acts of intercourse have been protected • has not had intercourse since last menses • has been taking pills correctly • has just had her menses
<p>Uterine sounds are not available in busy clinic inserting IUDs.</p>	<p>Clinician forced to rely on pelvic exam to determine size, axis, and flexion of the uterus. Perforation may result when mistakes are made.</p>	<p>Adequate sterile sounds should routinely be available if IUDs are being inserted.</p>

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Intrauterine devices (IUDs) (continued)		
<p>Provider inserting IUDs not allowed to manage infection. Antibiotics for a full 10- to 14-day treatment of pelvic inflammatory disease are not available for clinic to dispense.</p>	<p>Clinicians may refuse to insert the IUD at all if antibiotic treatment is unavailable should a pelvic infection occur. Untreated infections may lead to severe complications. Clinicians may be unwilling to insert IUDs if they believe follow-up is inadequate. The clinician who diagnoses a borderline case of pelvic inflammatory disease (PID) may use a "watch and wait" approach that leads to a more serious infection. Removing the IUD might have been more appropriate management.</p>	<p>In most instances, clinic providers should be able to manage the complications of the contraceptives they provide, including PID in IUD users. Alternatively, providers should be trained to recognize symptoms of common complications and refer patients to a larger clinic for treatment. Antibiotics such as tetracycline (or doxycycline) and ampicillin should be available for treating women with PID.</p>
<p>The levonorgestrel (LNg 20) IUD is not available.</p>	<p>An IUD that decreases a woman's risk for dysmenorrhea, PID, menorrhagia, and uterine myoma is withheld from use.</p>	<p>The LNg 20 IUD should be approved by the country's regulatory agency and made available and accessible to women.</p>
<p>The Copper T 380A must be removed after 4 or 5 years.</p>	<p>Women must have a highly effective, well-tolerated device removed too soon.</p>	<p>The Copper T 380A may be left in utero for at least 10 years.</p>

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Oral contraceptives (OCs)		
OCs can only be prescribed by a physician.	Because most physicians in most developing countries live in urban areas, many rural women may be unable to obtain pills.	Trained nurses and paramedical workers can provide pills by using a checklist to screen for contraindications. Physicians can handle complications and difficult cases and supervise the nurses and paramedical workers.
A Pap smear must be performed before a woman can begin oral contraceptives. A Pap smear must be performed annually for every woman given oral contraceptives.	If Pap smears are required to begin pills, many women, especially rural women, may have to rely on less effective methods until they get to a clinic. They may become pregnant while waiting for an opportunity or the money to visit a clinic. If Pap smears are not done at a particular clinic or materials are temporarily unavailable, oral contraceptives may not be offered.	Pap smears are a desirable routine medical screening procedure for sexually active women. However, because the contraceptive and noncontraceptive benefits of oral contraceptives give them a desirable benefit-to-risk ratio in most settings, they should be offered to women even if routine Pap smears are not available.

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Oral contraceptives (OCs) (continued)		
<p>A limit of 1-3 packages of OCs is set as the maximum provided at one visit. Women must return to a clinic for OCs 4-12 times a year.</p>	<p>Clients may be more likely to discontinue OCs. Methods that involve a "single decision" may be far more attractive than OCs. For example, an IUD may become more attractive than OCs even if a woman has reasons to avoid an IUD. Use of OCs is difficult for women who must frequently travel long distances for resupply.</p>	<p>In deciding the number of cycles to provide, always be aware of the distance and cost to the client to reach the provider. After a woman has used OCs correctly for 13 months without side effects, complications, or problems, strongly consider offering up to 13 cycles of OCs at a time.</p>
<p>A post partum woman must have had her first period before OCs are begun.</p>	<p>OCs are eliminated as an option for a woman who may ovulate and become pregnant before her first postpartum menstrual period.</p>	<ul style="list-style-type: none"> • Provide OCs to nonbreastfeeding women just after delivery or encourage women to start OCs 2 to 3 weeks postpartum. • If a woman is seen 6 weeks postpartum, is not breastfeeding, has not had intercourse, and has not had a menstrual period, start OCs but have patient use condoms in addition to the first cycle of OCs.
<p>OCs are not to be provided to breastfeeding women.</p>	<p>Breastfeeding women may become pregnant.</p>	<p>Strongly consider having progestin-only contraceptives available for breastfeeding women.</p>

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Oral contraceptives (OCs) (continued)		
Nonsmoking women aged 35 years and older are not to be provided OCs, even if they have no risk factors for cardiovascular disease other than age.	Providers are unable to prescribe a safe, effective method of birth control to older women. The beneficial effects of OCs in preventing ovarian and endometrial cancer are not available for these women.	Permit nonsmoking women 35 to 40 years of age to be provided OCs with less than 50 mcg of estrogen—as long as they have no other risk factors for cardiovascular disease, such as hypertension or diabetes.
Emergency contraceptive pills (ECPs)		
ECPs are not readily available.	A method that could reduce the risk of unintended pregnancy by 75% is denied to women, leading to increased abortions, many of which are illegal and performed in a dangerous manner.	Provide information to patients and providers about ECPs and post-coital insertion of the Copper T 380A. Use OCs in high doses within 72 hours of unprotected intercourse to prevent unintended pregnancies.
Use of the Copper T 380A as a postcoital contraceptive is discouraged.	A method even more effective than ECPs is denied to women. In addition, these women miss the opportunity to initiate long-term use of an extremely effective method.	Change policies to encourage use of copper-releasing IUDs as emergency postcoital contraceptives within 5 days of unprotected intercourse.

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Sterilization		
Husband or partner must authorize a tubal ligation for his wife or partner.	Tubal ligation may be eliminated as an option for an individual woman whose husband or partner wishes to control the decision as to how many children she will have.	Although it is clearly desirable for men and women to discuss and agree, women who bear children and carry a major share of the responsibility for rearing them should generally be able to decide to stop having children.
Emergency gynecologic and obstetric procedures take precedence over tubal ligations when operating room time is allocated.	Tubal ligations are delayed for women or never performed at all. Unplanned pregnancies occur.	Increase the amount of operating time, supplies, and personnel available to perform tubal ligations.
Women must have a certain number of children (e.g., three) and be a certain age (e.g., 30) before having a tubal ligation.	Women who know they want to stop childbearing are potentially unable to do so. Young women who want to finish their childbearing must endure the risks and costs of less effective contraceptive methods.	Consider eliminating laws or medical regulations limiting sterilization to women on the basis of the number of children they have had and their age.

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Sterilization (<i>continued</i>)		
Physicians are paid for the sterilizations they perform on a per-case or per-hour basis.	Physicians who are paid to work fast to earn more money may work too fast and thereby increase the risk of injury to the patient. Physicians who are paid on a per-case basis may pressure clients into sterilization to increase their wages and may not permit clients to change their minds before undergoing sterilization.	Clients should freely and voluntarily choose sterilization without pressure and be provided as high a quality of surgery as possible. Consider reimbursing physicians with a salary or on a per-session basis to avoid any possibility of coercing patients or providing less than the best care possible.
Barrier methods		
Only 3, 6, or 12 condoms may be provided at one visit. Condoms in large numbers are either unavailable, expensive, or embarrassing to obtain.	Makes condoms less attractive as an interim (e.g., between IUD removal and initiation of OCs) or long-term method. Relegates condom use to prevention of STIs. Diminishes the desirability and the credibility of condoms in the eyes of both providers and patients.	Consider offering large numbers of condoms at each visit (e.g., 40 to 100 condoms). Provide condoms anonymously to men or women. Encourage patients to give them to friends and relatives.
No contraceptive services are to be provided without documentation, including condoms to adolescent boys and older men.	Usually means that everyone receiving any contraceptive services must have a history taken or a physical exam performed. These practices can discourage people from using services.	Provide contraceptives such as condoms and vaginal spermicides anonymously without requiring that individuals officially "sign up" or be examined.

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Injectables or implants		
Norplant implants or injectables will be available for women who want to use these methods.	An important "single decision method" is available that will provide highly effective contraception for the person not wishing to consider sterilization at this time.	Gaining official clearance for Norplant is an important priority. Training programs for inserting and removing implants must be established. Follow-up systems must be functional to retrieve implants at the time of expiration.
Sexually transmitted infections (STIs)		
Screening will be performed on a routine, voluntary basis on family planning clinic clients.	Discussion of sexual history and explanation of HIV infection becomes part of patient management. Screening is time-consuming and expensive. Condom use is encouraged.	Offer volunteer HIV screening and provide adequate training and personnel to take the required history and to do the necessary counseling.
Sexual history is not routinely taken.	Sexual problems are not identified.	Several routine questions should be asked of all patients and included on history forms.
Microscopes are not provided to local family planning clinics for evaluation of vaginitis or urinary tract infections.	Trichomonas, bacterial vaginosis, gonorrhea, and Candida infections are more difficult to diagnose. Clinicians have to guess the diagnosis based on symptoms and physical characteristics of discharge.	Make inexpensive microscopes and necessary supplies available at all clinic sites where pelvic exams are performed. Train personnel to manage STIs syndromically (see Chapter 6) in the absence of testing capability.

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Adolescent clients		
<p>An adolescent female must be married, have a baby, or have parental consent to receive contraceptive services.</p>	<p>Unmarried adolescent females who are sexually active may get pregnant. Whatever the policy, it may present an ethical dilemma for a provider. Those who are willing to serve an adolescent may feel pressure to indicate on the chart that they are prescribing OCs for noncontraceptive indications such as acne, dysmenorrhea, or heavy periods rather than for contraception.</p>	<p>Adolescent females sometimes have intercourse without parental consent. Make sure they understand that abstinence is an option, but permit them to obtain contraceptives to prevent an unwanted pregnancy. Sex education programs and the ready availability of contraceptives prevent unwanted pregnancies and abortions.</p>
<p>A complete pelvic exam must be performed for every adolescent female obtaining OCs.</p>	<p>Initial pelvic exam may be uncomfortable for young women. Initial pelvic exam may deter adolescents females from coming to family planning clinics.</p>	<p>Flexibility is particularly desirable in this situation. Permit and encourage abbreviated exams. Have small speculae available to minimize discomfort. Consider providing OCs without the absolute requirement of a pelvic exam.</p>
<p>An adolescent female must have regular periods before being given the pill.</p>	<p>Pregnancies will occur in young teenagers who are denied access to OCs. Ovulation may precede the onset of regular menses in some women.</p>	<p>Provide OCs to young women who are sexually active and do not use condoms or another contraceptive. Make them aware of the risks of HIV and other STIs.</p>

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Adolescent clients (<i>continued</i>)		
Separate hours or facilities for adolescents are not provided.	Because young women and men may feel uncomfortable visiting during regular clinic hours, they may not obtain needed contraceptive services.	Consider providing separate hours or facilities for adolescents. Train providers to understand the emotional, sexual, and reproductive health needs of adolescents.
Clinic management		
Appointments are made on a first-come, first-served basis.	Tends to produce long waits. Permits women and men to come to the clinic at any time.	Provide care to some patients with an appointment system and make every effort to honor those appointments. Permit some patients to receive care on a first-come, first-served basis.
Appointments for complications and pregnancy tests are handled like routine appointments.	A delay in exam may adversely affect the outcome in cases of IUD expulsion, vaginal and pelvic infection, and urinary tract infections. Pregnancy termination, where available, may be delayed.	Appointment clerks must be taught a system of priorities (triage) so that women with urgent needs can be seen as soon as possible. Unprotected intercourse that could lead to unwanted pregnancy should be considered a high priority.

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Clinic management		
<p>Clinic hours limited to 8 am to 4 pm, Monday through Friday or to 1 day a week. No evening or weekend clinics.</p>	<p>Employed women with limited leave time are unable to attend the clinic during these hours. Men (partners and clients) may also find these hours difficult. Restricted hours are potentially dangerous for women with complications. Clients with problems may be forced to seek assistance from providers they do not know.</p>	<p>A wide range of clinic appointment times is desirable. Specify evening and weekend hours. Women should be taught exactly where to go for help should a contraceptive problem develop outside of clinic hours.</p>
<p>Forms in clinic fail to include questions about frequency of sexual intercourse, number of sexual partners in the past year and over the past decade, use of illegal intravenous drugs, number of STIs in the past, or number of acts of unprotected intercourse.</p>	<p>Provider's attention not directed to women at high risk for STIs (including HIV), sexual problems, or women at high risk for unplanned pregnancy. Some providers may be less embarrassed to respond to patients' written description than to ask questions.</p>	<p>Forms should include some questions about sexual subjects even if the provider finds them difficult to ask. If clients are literate, self-assessment forms (which women may fill out) may provide a more complete history and minimize embarrassment for client, provider, or both. Provider training should include taking a sexual history, counseling on prevention, enhancing client comfort, and having an open attitude.</p>

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Clinic management (continued)		
A chaperone must be present in the exam room for all pelvic exams, whether the examiner is a male or female.	Patient does not control what is happening to her. This rule may help the clinician to see patients more quickly or it may have just the opposite effect if clinician must wait for the chaperone. Patient may not ask certain personal questions if an additional person is in the exam room. This policy may increase a woman's embarrassment about being examined.	Be guided to some degree by patient's stated preference. Some women would prefer that only one person, the examiner, be present at the time of the exam, and this preference should be respected if possible.
Clients are interviewed in front of other women waiting for services and are examined without adequate privacy.	Clients may feel uncomfortable discussing issues with the provider with others present and will feel acutely embarrassed to be examined without adequate privacy.	If possible, provide a separate room or place a curtain near a corner for individual counseling of clients. Always ensure privacy during exams by providing screens around the examining table and by not permitting guests to interrupt exams.

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Clinic management (continued)		
<p>Providers speak the language of the educated (using very technical terms) to establish a professional identity.</p>	<p>Many potential family planning users do not understand the language of the educated provider. As a result, they are unwilling to seek services at the clinic or, if they do, they do not understand the instructions regarding use of the contraceptive method.</p>	<p>Ensure that at least one person on the staff speaks the language or dialect of most of the clients served by the clinic or program. Make available informational materials in local languages.</p>
<p>To encourage more effective contraceptive use, providers are paid differential incentives for encouraging certain methods, such as the IUD or sterilization.</p>	<p>Providers who are paid more (or given incentives) for providing IUDs or sterilization than for other methods may be tempted to push these methods over others, even when they may be contraindicated for medical or social reasons.</p>	<p>Clients should be informed about a range of methods and assisted in selecting the method most appropriate for them medically and psychologically. The client should freely choose the method without coercion.</p>

Table 24:2 Administrative decisions and their impact on the client/patient (Continued)

Administrative decision	Impact on client/patient	Recommended practices/policies
Clinic management (<i>continued</i>)		
<p>The procedures for ordering and shipping contraceptives from central stores to local clinics and providers result in an inconsistent local supply. Although contraceptives are very inexpensive, particularly if donated, their distribution is often handled by supply officers who attempt to ration contraceptives like expensive antibiotics, thus arbitrarily altering supply requests. In response, clinics begin tripling their requirements in anticipation of reductions. The lack of an appropriate supply policy leads to clinics running out of contraceptive supplies.</p>	<p>Clients may visit clinics or providers at great cost or may travel long distances to discover the contraceptive they use is unavailable. They are discouraged from continuing the method and may have an unwanted pregnancy. The motivations of providers as well as their reputations suffer when they cannot provide methods to clients.</p>	<p>Establish a dependable supply of contraceptives from central depots to local providers. Encourage providers to project contraceptive needs and order supplies early. When shortages occur, allow providers to borrow supplies from one another.</p>

Approaches to Delivery of Family Planning Services

A young married couple with an infant child decided they would like to wait a few years before having their second child. When the wife went to the well-baby clinic on Friday, she asked how she could delay her next pregnancy. The nurse told her to return on a Tuesday, which was the day the clinic provided family planning services. The young woman knew she would not have time to make a separate trip for family planning services as well as baby care, so once back in the village she asked a friend who used family planning where she went for services. The friend promised to ask her community health and family planning worker to visit the woman. At the visit a few days later, the community worker explained the methods of family planning available. They decided that the injectable hormonal contraceptive was the best method for the young woman at this time. The community worker administered the shot, collected the small fee, and said she would return during her next visit to the village. Then, if the woman had no problems with the method, the community worker would return every three months to provide the injections.

For a family planning program to meet the needs of its clients and achieve program goals, its services must be *accessible* to everyone who

wants to use them. The easier it is to obtain contraceptives and services, the more likely it is that people will use them.¹ Accessible services meet the following criteria:

- They are relatively *easy to get to*.
- The clinic provides *good quality care*: clients do not wait too long for services, providers listen and respond to the needs of the clients, providers are technically skilled, and clients receive the services they need.
- Services are *affordable*.
- The concept of family planning and the services provided by the program are *well publicized* so that everyone who wants to space, limit, or prevent births knows that there are ways to do these things, knows about the program, and knows where to get services.
- Staff *fully and clearly explain the contraceptive methods* that are available so that clients can decide what method is best for them.
- *An adequate supply* of contraceptives is always available.
- Services are provided at *regular, known times*.

How do the family planning services offered by the health system in which you work respond to your clients' needs? How many of the characteristics listed above describe your program? Can you provide each client with the right contraceptive method and medical care if there are complications? The range of health and family planning services offered in Africa differs considerably from country to country. Some countries offer family planning services through a well-developed network of clinic services. Others have established clinic-based systems but find that shortages of medical personnel and money prevent them from reaching remote populations. As a result, these countries have developed community-based approaches to providing health and family planning services, including distributing some contraceptives through commercial sales. Family planning program managers can choose from a variety of service delivery approaches. In fact, managers can select a combination of approaches to make their services accessible to family planning clients in their area.

DELIVERY STRATEGIES

Service delivery strategies need to be tailored to reach populations in different locations—urban areas, rural towns, villages, and remote areas. The most common service delivery sites include clinics, community-based distribution (CBD) programs, commercial retail sales, workplace programs, postpartum programs, and private physicians. Advantages and disadvantages of some of these approaches are presented in Table 25:1.

CLINIC-BASED SERVICES

A clinic-based approach is reasonable in areas where clients do not live far from the clinic. Clinics often have the advantage over other service delivery strategies of being able to provide methods that are more medically complex, such as intrauterine devices (IUDs), hormonal implants, injectables, and sterilization.

In urban areas and rural towns, family planning is most often provided by clinics that integrate it with other health services for women and children or offer it only on certain days of the week. (It is preferable, but not always possible, to have family planning services available during all the hours that the clinic is open.) Most government-run clinics are integrated clinics that offer multiple health care services; privately funded clinics generally offer only family planning services.

An *ideal* integrated clinic has these features:

- All staff members are trained to provide family planning services.
- All staff are trained together and thus feel confident of each other's abilities; one member can readily stand in for another.
- One supervisor oversees all staff members.
- The supply of medicines, contraceptive supplies, and vaccines through one channel is dependable.
- Difficult cases are referred to specialists and the original providers follow through on the results.

Table 25:1 Advantages and disadvantages of approaches to providing family planning services

Advantages	Disadvantages
Clinic-based Services: General	
<ul style="list-style-type: none"> • Clients are seen at each visit by health care professionals. • Problems can be detected and treated during the visit. • A switch in contraceptive method can be accomplished easily at the clinic. • The whole range of contraceptive services can be provided, including sterilization, intrauterine devices (IUDs), and injectables. 	<ul style="list-style-type: none"> • Clients are limited primarily to those living near the clinic. • The nurse or midwife might not be familiar to the client because the client may not see the same staff member each time. • Clients are expected to come on their own initiative, both initially and for follow-up. • Clients may have a long wait before receiving services.
Clinic-based Services: Integrated family planning and maternal and child health	
<ul style="list-style-type: none"> • Clinic can attract mothers coming for other services and introduce them to family planning. • Users can receive pediatric, obstetric, and gynecologic care, along with family planning services in one setting. • In theory, there are easier transitions from postpartum to family planning and from family planning to prenatal care. • Clients who are uncomfortable with the social stigma, if there is one, of contraception are not so easily identified as users of family planning. • Family planning can be established as an important element in the health of women and children. • Start-up costs of providing family planning care are low if maternal and child health (MCH) services are already available. 	<ul style="list-style-type: none"> • Family planning issues are generally considered only after child and maternal health problems are addressed. • Administrative functions are more complicated, especially if contraceptive resupply and reporting of service statistics for family planning services are not integrated with the support systems of the MCH program. • Workers who are not specifically trained in family planning may lack the needed skills and motivation to be effective providers. • The physical facility (clinic or health center) may not be able to accommodate family planning services.

Table 25:1 Advantages and disadvantages of approaches to providing family planning services (Continued)

Advantages	Disadvantages
Clinic-based Services: Family planning only	
<ul style="list-style-type: none"> • Family planning workers are more motivated to deliver family planning. • More time can be spent counseling and educating each client about family planning. • Generally, a better worker-to-client ratio exists for family planning. • Workers who have received special training in family planning may be more effective. • Unmarried women without children may be more comfortable in this type of facility. 	<ul style="list-style-type: none"> • Clients must be motivated to come on their own for family planning services. • Transitions are not smooth from the postpartum to the time a woman needs family planning services or to the time she needs prenatal care. • Women must visit other facilities to receive other health services. • Clinics cannot offer services that attract many mothers who then learn about family planning while at the clinic. • Clients, particularly unmarried ones, who are uncomfortable with the social stigma of using contraception may not want to be seen at the clinic.
Community-based Distribution (CBD)	
<ul style="list-style-type: none"> • This option is more convenient for clients, who need not travel long distances. • Supplies are distributed by someone the client knows and trusts. • Postpartum mothers can be identified and visited. • Follow-up is easier. • Client motivation is maintained at a high level through continuous interaction with the CBD worker. • CBD is sometimes a cost-effective approach. 	<ul style="list-style-type: none"> • Full MCH or family planning services are not offered. • Immediate access to clinical staff for managing problems is not available. • Some health professionals resist having the CBD workers or volunteers offering services. • The client may feel there is little confidentiality. • The client may lack confidence in the nonmedical worker. • Initial program costs per client may be high.

Table 25:1 Advantages and disadvantages of approaches to providing family planning services (Continued)

Advantages	Disadvantages
Commercial Retail Sales	
<ul style="list-style-type: none"> • Can reach remote areas not reached by other programs. • Clients need not travel long distances. • Distributors are motivated because they earn profits from sales. • Availability of methods is well publicized. • Client does not have to wait in a clinic to receive the method. • Client has anonymity. • Costs to the client and the government can be low. • Resupply to distribution points is usually reliable. 	<ul style="list-style-type: none"> • Full services are not offered. • Clients must go to a clinic for management of their health problems. • Starting a program can be costly. • Promotion and advertising of contraceptives may be subject to criticism. • Full client education and counseling on contraceptive methods may be lacking.

Unfortunately, many countries do not have enough health workers to staff their clinics. However, with some supervision by a physician working part time, trained nurses and midwives can examine women, prescribe the appropriate family planning methods, and manage minor problems.

COMMUNITY-BASED DISTRIBUTION (CBD)

In areas that do not have clinics nearby, family planning services may be made available through CBD programs. In this approach, CBD workers, usually village women, are trained to educate their neighbors about family planning and to distribute certain contraceptives. In some programs, CBD workers also provide some primary health care services.

In their training, the CBD workers learn the basic concepts of family planning, how each method must be used, what the precautions and side effects are for each method, and how to keep simple records and report the information to their supervisor. CBD programs usually distribute condoms; some also provide pills and spermicides, and a few have trained CBD workers to administer injectables. In some programs, the workers receive some kind of payment; in others they are strictly volunteers. A midwife, family planning nurse, program coordinator, or other staff member is usually responsible for supervising the CBD workers' activities and managing any problems that occur.

Family planning administrators may find that CBD services are most effective when a program is fairly new and people are not familiar with contraceptives. Because local residents bring family planning services directly to individuals, they make family planning both convenient and culturally sensitive, and these residents are always nearby to answer questions. Adding CBD services to existing clinic services has been shown to make family planning more acceptable to a community and to increase a program's impact.¹

COMMERCIAL RETAIL SALES

In both urban and rural areas, if people are willing to obtain contraceptives from sources outside the health care system, commercial retail sales (sometimes called social marketing) can make some contraceptive methods very accessible. In this approach, contraceptives such as oral contraceptive pills, condoms, and spermicides are sold at reduced, subsidized prices in pharmacies, market stalls, stores, barber shops, beauty salons, and bars and are advertised on the radio and in newspapers. Some programs also offer injectables and IUDs, which clients purchase in pharmacies and take to a private physician or a clinic for insertion.¹

When a commercial retail sales approach is used, the retailers are often the customers' only source of information about the products. These retailers should be given training in basic information about the products and how to refer people who have problems with a contraceptive.²

OTHER APPROACHES

Several other service delivery methods have been used. Some companies provide family planning services during certain hours at the *workplace* to reduce health care costs and absenteeism related to pregnancy and childhood illnesses.³ Some hospitals and maternities provide family planning counseling and services immediately *postpartum* because that may be the only time that a woman comes in for health care and is available for family planning education. (This approach is discussed in detail in Chapter 12, Lactation and Postpartum Contraception.)

In most countries, family planning services are often available from *private physicians*, although generally at a higher cost. Other approaches involve training paramedics, pharmacists, traditional birth attendants, midwives, traditional healers, and outreach workers to provide family planning services.¹ Whatever delivery strategies they have chosen, African countries have, in recent years, dramatically increased access to family planning services.

FINANCING FAMILY PLANNING SERVICES

Family planning services are usually financed through one or more funding strategies:

- Government support
- Private providers, such as family planning associations
- Client charges (fee for service, registration fee, membership fees, or copayments)
- Grants from international or local donors
- Insurance or other third-party payment mechanisms, in which the client pays part of the fee and the rest is paid by the employer, health plan, or insurance company
- Cross-subsidies (revenue generated by and transferred from other health services)

Government support for family planning services is usually limited to services that can be provided by the government's existing facilities, staff, or projects.

Private agencies, such as family planning associations affiliated with the International Planned Parenthood Federation, sometimes charge enough to cover all costs, but more commonly charge only a fraction. Such agencies are often located only in larger cities.

Clients are often charged a flat fee, such as a registration fee, when they are first seen in a clinic or a fixed service fee at each visit. Less often, fees are charged for a particular service provided, such as IUD insertion or sterilization. Charges rendered often cover only part of the cost of providing the service. Client fees are discussed in greater detail below.

Many programs receive assistance directly or indirectly from international donor agencies. These grants often support specific elements of programs, such as equipment, contraceptive commodities, or informational materials.

In most of Africa, membership fee payments, copayments, insurance coverage, and other third-party coverage are virtually unknown as a source of revenue.

Cross-subsidization provides support for one service by charging extra for another service or by charging more in one location than in another. This strategy is most often used in an integrated setting where several services, including curative care, are provided. The revenues generated from curative care fees can subsidize some costs for other programs whose benefits are less obvious to clients (preventive services such as family planning and immunization). In locations where clients are able to pay more, higher fees may be charged to subsidize lower fees in poorer areas.⁵

FEE PAYMENT SYSTEMS

In some countries, clients are asked to pay a small fee for their contraceptives. However, there are several factors working against charging fees for services. Family planning and other health services operated by African governments have often been provided without charge to patients, for the following reasons:

- Throughout most of the first half of the 20th century, medical care was usually provided free of charge by colonial authorities and missionaries. This pattern has continued since independence.
- A commonly held belief is that family planning should be provided free as a matter of principle. This belief persists despite evidence that people will pay for goods and services if they are of good quality and indeed prefer them to those they can get for free, which they perceive to be of lower quality. In addition, governments with a limited health budget may not be able to afford to provide free services or contraceptives everywhere they are needed, or they can provide only inadequate services.
- Charging fees excludes the very poor from services. Poor clients may be forced through desperation to pay for acute curative care, but they are likely to strongly resist paying for preventive care, including family planning.
- Many international donors furnish vaccines, medicines, and contraceptive supplies under the condition that clients receive them free of charge. (This policy is gradually changing.)
- Collecting and transferring payments received from clients is time-consuming and perceived as an inappropriate task for nurses and other clinic staff who are trained to provide medical care. In addition, many clinics have difficulty maintaining accurate accounting or billing records. Sometimes the cost of managing the money is more than the amount collected.

Despite these barriers, completely subsidized services probably cannot continue much longer. Neither governments nor donors can afford to continue to provide free care. Although contraceptives are often supplied by donors with the requirement that they be provided

free to clients, it may still be possible for programs to charge clients a fee for the services provided by clinic staff. Some commercial retail sales programs have successfully marketed contraceptives for a small price, which shows that some clients are willing to pay for them. In fact, studies have shown that people often place a greater value on services and contraceptives they purchase with their own money and thus may be more likely to use them than services and contraceptives that are free.⁴

Setting up a fee payment system to recover some or all program costs requires several steps:

- Assessing the clients' willingness and means to pay
- Eliminating any administrative or legal barriers to collecting fees
- Determining how the collected fees will be used
- Determining what services and goods to charge for
- Establishing fee levels
- Setting up a system of administrative controls for all transactions, particularly those involving cash
- Collecting the fees from the clients

MIX OF CONTRACEPTIVE METHODS USED IN A PROGRAM

Ideally, each family planning program should offer a balanced selection of family planning methods, although sterilization and insertions of IUDs and Norplant implants are restricted to sites with appropriate facilities and trained staff. The methods offered by a program are influenced by the system in which they are distributed as well as by cultural or religious preferences and the reliability of the logistics system.

Although clinics and private physicians are generally able to offer all major contraceptive methods, not all service delivery approaches can be as comprehensive. Guidelines for offering various contraceptive methods under three delivery strategies are shown in Table 25:2.

Diaphragms and contraceptive creams and jellies are rarely available in most African clinics, even in urban areas. Clinic-based program staff should, therefore, concentrate on ensuring that pills, condoms, and spermicidal tablets are always available.

OBSTACLES TO SERVICE DELIVERY AND POSSIBLE SOLUTIONS

In many African countries, several barriers keep women from obtaining family planning services (in some areas, such services are just simply not available). These barriers, which can be both physical and cultural, often differ by area.

RURAL AREAS

In rural areas, the limited family planning services available are generally provided by the Ministry of Health or other government programs; a few missions, private family planning association clinics, or commercial retail sales programs may also exist. There are few government hospitals or clinics, and those that do exist sometimes lack water, electricity, equipment, or medicines. In some cases, government clinics are staffed by only one person and may close altogether if that person is ill, transferred to another post, or on maternity leave. Medicines are often limited to what has been supplied free to the government by international donors. To receive supplies, clinic staff may have to pick them up from a remote warehouse or store. When transportation is provided, the deliveries may be unreliable or sporadic. In rural areas, most potential clients are aware of these problems with health care services, and it is not surprising that they often seek services only in emergencies. When the need for family planning is outweighed by difficulties in obtaining services and supplies, unplanned pregnancies could result.

Table 25:2 Guidelines for use of contraceptive methods with alternative delivery strategies

Contraceptive method	Clinic-based	Community-based	Commercially distributed
Oral contraceptives: Low-dose combined pill and progestin-only pill. Can potentially be distributed by anyone with a checklist.	X	X	X
Intrauterine devices (IUDs): Must be inserted by a physician, nurse, or trained paramedic.	X		
Sterilization: Tubal ligation and vasectomy. Operation is mainly performed by physicians; can be performed by trained nurses and midwives. Must have the proper facilities.	X		
Injectable contraceptives: Depo-Provera and Noristerat. Injection can be given by physicians, nurses, or trained paramedics.	X	X	X
Implants: Long-acting hormonal implants (e.g., Norplant). Must be provided by someone, usually a physician, who has been trained in insertion and removal.	X		
Condoms, spermicides, foaming tablets: Nonmedical methods can be provided by anyone.	X	X	X
Creams, jellies, foams, diaphragms: Less popular non-medical methods. Diaphragm is usually fitted by a medical professional.	X	X	X
Instruction in fertility awareness methods: Timing of ovulation, abstinence. Trainer must be knowledgeable in the methods.	X		

Using a CBD program or a commercial retail sales program with widespread rural coverage could help alleviate several problems: lack of access to services, staffing shortages (particularly if the CBD program uses volunteers), and an emergency-only attitude toward health care services. A CBD program manager would still have to oversee the transportation and steady flow of supplies. CBD workers could be trained to provide some primary health care services.

URBAN AREAS

Lack of services and barriers to service are problems in urban areas as well, but family planning clients may find it easier to obtain services there because of the greater number of hospitals and clinics, which are better equipped and more fully staffed. Medical equipment and supplies are more likely to be available in urban areas because the transportation problems that affect rural areas are less severe. In addition, electricity and running water are available most of the time.

In cities, one important barrier to service is long waiting times, particularly early in the day. In addition, services are sometimes provided only on certain days (for example, maternal and child health [MCH] services on Monday, prenatal care on Tuesday, immunization on Wednesday). Such policies make it difficult for clients to get the services they want when they need them.

Because some clients may not be able to return on the day the service is scheduled, family planning program managers should try to integrate their services into existing facilities and offer them at the same time other services are offered. Doing so would be particularly important in MCH centers and for prenatal and postnatal programs, which are set up to serve women who are prime candidates for contraceptive services. Women accompanying their children to immunization clinics are also potential family planning clients; information on family planning can be made available to them while they wait. Long waiting times can often be reduced by studying how health care workers use their time and determining when the clients spend the most time waiting, then changing office hours or appointment systems.

Program managers might explore other ways to provide services to rural and urban areas, such as developing social marketing programs and household distribution programs or making referrals to clinics run by a local private family planning association.

OTHER OBSTACLES AND SOME SOLUTIONS

Sterilization

Sterilization is probably the family planning method most difficult to obtain in Africa. In rural areas sterilization is almost nonexistent, and in cities it is often unavailable because of the lack of necessary equipment and trained staff. Because increasing the availability of such services requires long-term funding for equipment and intensive staff training, the most practical short-term alternative is to provide clients with another contraceptive method.

Cultural Barriers

In many cultures, contraception is resisted by women, men, other family members, or the community at large. Still, people recognize the need to produce healthy children. Educating both clients and local leaders can help improve attitudes toward family planning and child spacing. Clinic staff should describe the health benefits that child spacing provides to both mothers and children. Staff can explain how the use of modern contraception serves the same purpose of child spacing that was traditionally achieved through practices such as abstinence and prolonged breastfeeding. Education can also diminish concerns about the side effects of specific methods. The provider should point out to new clients that complications from too many pregnancies, or even a single pregnancy, are far more dangerous than the side effects of any of the contraceptive methods.

Involving community leaders can help gain the confidence of the local population. The support of community leaders should be genuine and voluntary and derive from their belief that healthier children are advantageous to the community and put less of a strain on health

and educational services. Pressuring people to use contraception is ethically unacceptable and ineffective, even in the short term. Information and encouragement, however, are entirely appropriate.

Privacy

Lack of privacy in the provision of contraceptive and other medical services is a problem in some clinics. There are usually no short-term solutions to this problem, as it generally requires constructing or renting more office space. However, rearranging work-space areas or putting up curtains or screens often can improve the situation.

Some women want to use family planning but think their husbands will object. Methods that can be used without the knowledge of the husband are available; injectables are particularly appropriate in such situations. Sterilization (if available) is suitable when the woman decides she wants no more children, but she must be made aware that the procedure is not reversible.

Laws and Policies

In many African countries, particularly Francophone ones, laws dating to the early part of the 20th century officially prohibit the use of contraception. Program managers should work with higher ministry staff to gain support for repealing such laws, encouraging instead the voluntary use of contraception. However, even though such prohibitive laws exist, they are often not enforced, and in most countries, family planning services can be provided without interference. Many clinics also provide services to unmarried or teenage clients with little interference from authorities. To help overcome these barriers, the Ministry of Health can support providers by establishing client-oriented national service policies, norms, and protocols until the laws are changed.

Clinic Management

Some service delivery problems can be resolved by common-sense clinic management and by training. For example, a clinic management

analysis can indicate how staff spend their time and show ways to eliminate or change inefficient practices. Staff can be asked for suggestions on how the clinic could be better run or ways it could serve its clients better. Clients may also be asked to make suggestions.

Staff can be trained in improved program management skills or in new technical skills that allow them to provide additional services. However, training must be provided wisely. Pressing day-to-day problems are not solved by sending someone to school; indeed, the service problems may become worse if no one is available to replace the person being trained. Still, staff training must be a priority for clinic managers so that they can keep up with changes in medical procedures, diagnosis, and treatment. Fortunately, training in the use of most contraceptive methods is fairly simple, and it is possible for supervisors to conduct individual training sessions with their staff or to train groups on-site.

Obstacles to service delivery exist in every location. Family planning program managers and service providers need to consider what particular obstacles exist for their clients and potential clients, then develop solutions to improve access to family planning services. Obstacles can often be overcome by better management of the program itself and by providing better quality services. These topics are discussed in the next two chapters.

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Effectively Managing Your Family Planning Program

When Nurse Mutanga took over managing the maternal and child health and family planning clinic a year ago, she had no idea how complicated the task would be. She had experience in supervising staff and had usually been successful at keeping them motivated through her enthusiasm, fair treatment, and recognition of work done well. However, she found she had much to learn about hiring and training new staff, properly managing contraceptive and drug supplies to avoid shortages or damaged contraceptives, making sure every aspect of client care was satisfactory (the information provided, the setting, the privacy, and the counseling and clinical services), and submitting accurate reports on time about clinic activities. As if learning how to do all these tasks were not enough, there were often last-minute emergencies that took her attention away from her daily administrative duties.

A family planning program must be well managed if it is to provide its clients with good-quality services. This rule is equally true for large programs and for individual clinics. A well-managed family planning program has the following characteristics:

- The staff is qualified and trained.
- The staff follows protocols that are free of barriers.

- Staff members receive the support and guidance they need from their supervisors.
- Sufficient amounts of contraceptives, other supplies, and necessary equipment are on hand at all times.
- The staff submits accurate reports on schedule and the clinic (or other service delivery point) receives feedback from higher administrative levels.
- Problems are identified early and resolved.
- Clients are treated with respect and are satisfied with the services.
- The program's goals and objectives are compatible with those of the community.

Good management is vital to the success of a program, but it is often overlooked. Because the people who administer and supervise clinics and programs are often health professionals with little or no management training or guidance, this chapter reviews the basics of family planning program management:

- Selecting and training staff
- Supervising staff
- Managing contraceptive supplies
- Collecting, analyzing, and reporting information

The concepts presented here are not specific to programs in Africa; they apply generally to all programs. We recognize that, in some countries the administrative structures make it difficult to follow these recommendations. However, these concepts are presented as ideals that programs should try to achieve, not as specific requirements that must be met.

When managing a program or clinic, a manager can get caught up in the daily details and crises and forget the program's purpose. The manager must always remember—and remind staff—that the goal of the program is to meet the needs of the client by providing good-quality services.

SELECTING AND TRAINING STAFF

Staff members are the central part of any service delivery program. Because staff must be skilled in the services they provide and motivated to serve their clients, it is essential to select appropriate staff members and to train them well. In a program that provides high-quality services, the staff safeguards the client's health and the client trusts the providers and the services.

SELECTING STAFF

Because staff are so critical to the success of a program, they must be selected carefully. To hire the right person for a job, prepare a *job description* that lists the following:

- Responsibilities and tasks required
- Required attitude toward patient-oriented service delivery
- Qualifications, past work experience, skills, and desired qualities
- The supervisor for the position

The job description serves as a guide to selecting the new employee and helps the job candidates decide whether the job is right for them. Later, the job description can also be used for supervision and performance evaluation.

Attitudes are among the hardest personal characteristics to influence, yet they set the tone for behavior and behavior change. Explore the attitudes of potential staff members by posing questions, written or oral, about situations that might be encountered during the delivery of services.

In most public programs in Africa, the clinic manager does not select and hire staff; the personnel department of the ministry or agency has this responsibility. However, job descriptions remain useful, as they serve as a guide for the employee and as an evaluation tool for the supervisor.

ORIENTING STAFF

Whenever new staff begin work or procedures change, some orientation is necessary to make sure that employees understand exactly what they are supposed to do. Orientation can be carried out in various ways—through a presentation, a workshop, a meeting, or written communication. Managers should fully inform staff of all policies and of policy changes so that services are run well and staff morale is maintained.

Employees who have just been hired usually receive an orientation at the central level. A less formal orientation should be conducted at the clinic where the new employee is assigned. The manager or supervisor should ensure that by the end of the orientation the employee is familiar with all the procedures and capable of carrying out all required tasks.

Both for the orientation itself and for later reference, all staff should have access to a *personnel manual*, which should include an overview of the organization's purpose and structure, all personnel policies (such as benefits, grievance and termination policies, and policies for time off), and administrative procedures. The manual should be in a folder or loose-leaf notebook so that any changes or updates can be easily added.

STAFF DEVELOPMENT

Staff development means providing employees with opportunities to improve their skills, both in performing new tasks and in doing current tasks better. Staff development is important for several reasons. First, because people often get bored when they have to perform the same tasks over and over, learning and practicing new skills can improve both morale and performance. Second, by training staff in new skills, program administrators are better able to retain valuable staff who, as a result, become increasingly skilled and qualified. Third, training current employees is a more cost-effective way of obtaining highly skilled staff than is hiring new, more skilled staff.

Staff can expand their responsibilities or increase their skills in numerous ways. Staff members working in just one of a clinic's technical areas (clinical, administrative, or educational) could learn to take on responsibilities in another area. In addition, clinical staff can be trained to take on more advanced clinical tasks, thus increasing the clinic's ability to provide needed services. For example, in some countries nurses have been trained to insert intrauterine devices (IUDs) and Norplant, and nurses' aides have learned to take blood pressure and conduct other screening tests.

Staff development can take a number of forms: delegating more responsibility to staff, providing them with reading materials, conducting in-service training sessions, or allowing staff time off to attend seminars and courses. The greatest influence on staff development, however, may well be the attitude of the manager or supervisor, who should encourage staff members to keep learning and advancing and who should promote an environment of cooperation and the open exchange of ideas.

SUPERVISING STAFF

Supervision is an underappreciated aspect of managing a program. The purpose of supervision is to guide and support staff so that they can perform their tasks well. Poor supervision can lead to an inability to solve problems at service delivery sites, wasted staff skills, poor training, frequent shortages of commodities, and dissatisfied clients.¹

The supervisor should be a supportive problem-solver who notices and recognizes good work as well as problems. Ideally, supervisors should collaborate with staff to identify problems and find solutions; if they do, staff will learn to manage problems on their own and not leave them for months until the supervisor visits.

Supervision is carried out in two ways: by reviewing written materials (such as review of service statistics or reports) and through observing and making personal contact. Personal contact is necessary to find out what is actually taking place, resolve any problems, and renew staff morale and enthusiasm. Supervisory visits, which may

occur infrequently, are often the only opportunity for the employee to get any praise for a difficult job well done.

One problem frequently associated with supervision is the perception that the supervisor acts as a critic or disciplinarian. This perception is particularly strong when a supervisor from outside makes rare visits, spends them investigating problems, and assigns blame rather than helping to solve the problem. All supervisors, particularly higher-level program managers, should avoid acting like punitive disciplinarians.

Because supervision is essential to an effectively managed program, family planning programs should invest in training their supervisors in essential supervisory skills such as helping service delivery sites assess their own needs, facilitating group discussions, and guiding staff in solving their own problems.

THE SUPERVISOR'S TASKS

A supervisor may work at the same site as those being supervised or may visit periodically from a central or regional office. An employee may have both kinds of supervisors. In either case, the main function of a supervisor is to help the staff perform their jobs better by providing support:

- Guidance and training
- Assistance with resources and logistics
- Support, encouragement, and advocacy for their concerns and rights
- Regular feedback on their performance

A supervisor's basic functions include the following:

- Setting individual performance objectives (the activities an employee should accomplish by a certain date) for and with each employee

- Managing any performance problems and conflicts that arise and motivating and encouraging employees to do their best work
- Having regular contact with employees to motivate them; help solve their problems; and provide them with feedback, guidance, assistance, and support
- Developing a supervisor's session plan, then going over selected items in each supervisory session
- Preparing a schedule of upcoming supervisory sessions with employees that lists the date of each session and any items that need to be discussed
- Conducting periodic performance appraisals to review an employee's job performance to help ensure that performance objectives are being met
- Reaffirming the mission of the organization; periodically reminding staff of the organization's values, principles, and goals; and strengthening staff commitment to them

Although supervisors have their own styles of supervision (some are task-oriented, others are relationship-oriented), they should consider what type of supervision is appropriate for each employee. Some employees work best independently and need little direction. Others work better when they have more interaction with and support from the supervisor or other staff. In any case, a supervisor should always consult an employee before making decisions and judgments about her or his work.

THE SUPERVISORY PROCESS

Supervisors are doing their most important work when they meet with one or more employees to review and discuss ongoing and completed work, go over any problems the staff is encountering, and plan upcoming work. These meetings can take a variety of forms (day-to-day interactions, scheduled supervisory meetings or visits, individual

or group sessions, or meetings to provide techniques for self-evaluation), but in all sessions the supervisor will have basic objectives:

- Make sure the staff members have the necessary interpersonal skills to provide their clients with the guidance and support they need.
- Check that the staff members have the knowledge and technical skills needed to carry out their jobs.
- Deal with any personal work-related issues of individual staff members.

PROVIDING FEEDBACK

Poor communication between supervisors and employees is common. A supervisor's job is to provide constructive feedback. It is just as important, if not more so, to let employees know when they are doing a good job as it is to alert them to a problem. Although it is good for staff morale to publicly praise an employee's work, any criticism of performance should be given in private.

Effective feedback has several characteristics:

- *Task-related* (related to a specific task and based on actual observation)
- *Prompt* (given right after observing the task being performed)
- *Action-oriented* (related to improvements that employees can make)
- *Motivating* (starts with positive feedback, then discusses what needs improvement)
- *Constructive* (explains how staff can improve their performance and emphasizes the importance of the work)

SOLVING PROBLEMS

Problems and conflicts occur in every program, and one of a supervisor's responsibilities is to work with employees to discover and resolve their problems. Once the supervisor has determined that a problem exists, the next task is to discover its cause. The supervisor and employee can begin by asking the following questions:

- What exactly is wrong?
- Where is the problem taking place?
- When did the problem start?
- What are the causes of the problem? Can they be removed or changed?
- Who is involved in the problem?
- What is the desired (mutually agreed upon) result?
- What resources will be needed to solve the problem?

Problems can be caused by interpersonal conflicts or by ill-designed or poorly functioning management systems. In any case, the supervisor must remember to remain neutral and try to find a solution acceptable to both the employees and the management.

Another common problem is the perceived poor performance of an employee. Unsatisfactory performance may be due to several factors, including excessive workload, poor working conditions, insufficient training or qualifications, lack of interest in the work, or personal problems. The supervisor should investigate thoroughly before taking any corrective steps. The investigation might be conducted as follows:

- Find out whether the employee has been adequately supervised and knows what is expected of her or him.
- Determine the exact nature of the problem.
- Compare the employee's performance objectives and job description with the work performance, and see whether any previous action has been taken.
- Try to determine possible reasons for the gap between objectives and results.
- Talk privately with the employee and find out her or his assessment of the situation.

MANAGING CONTRACEPTIVE SUPPLIES

Every facility that serves family planning clients must have supplies of all the contraceptives it offers, including each of the brands it distributes, on hand at all times. If it runs out of a particular contraceptive, clients may have to accept a substitute or go without contraceptive protection; if this happens frequently, clients may give up on family planning altogether. On the other hand, it is poor management to have an oversupply of a particular type of contraceptive, because some may expire before they can be used, resulting in a waste of money and commodities.

To prevent such shortages and overstocks, every program must have an effective system to manage commodities to ensure that the *right quantity* of the *right goods* are sent to the *right place* at the *right time* in the *right condition*. For a contraceptive management system to work effectively, each of the following components must be working well:

- Selection and forecasting
 - The decision makers must select the contraceptive methods and brands the clients want and provide as full a selection of methods as possible.
 - The managers must make reasonably accurate estimates of the demand for each method, taking into account current trends in contraceptive use and the program's planned promotional and educational activities.
- Transportation and storage
 - The contraceptives must be shipped from the suppliers to the warehouses on time.
 - The warehouses must store the commodities under adequate conditions and use the first-to-expire, first-out technique so that contraceptives do not expire in the warehouse.
 - An adequate transportation system must exist to move the contraceptives where they are needed when they are needed.

- Documentation and information
 - An effective logistics information system must be in place so managers know what quantities of supplies are on hand, can see that supplies are maintained in appropriate amounts, and can ensure that new supplies are ordered on time (managers must factor in the "lead time" between when supplies are ordered and when they arrive).

FORECASTING FUTURE CONTRACEPTIVE NEEDS

Forecasting

In small clinics and health posts, it is often not necessary to use a formal forecasting technique; the person in charge often has a good idea of monthly and annual consumption rates and how much is needed. If there is information on past contraceptive use, simply estimate the program's needs for the future based on this information, including a small reserve stock level and possibly a small amount for growth. If there are no reliable data on past distribution, future consumption can be estimated from the service statistics of clients from the past year. Estimate how many new and continuing family planning clients you will have in the next year, and use the guidelines in Table 26:1 to calculate the supplies that would be needed for each continuing family planning user for a year and for anticipated new users. (The numbers in the table may seem high, but they factor in amounts lost to damage or expiration.)

Larger facilities at the provincial and regional levels will need to go through a more formal forecasting process: Determining the level of consumption of each contraceptive method and brand in the previous year, aggregating (summing) the consumption data from the service delivery points, then using the results to estimate future demand while making any necessary adjustments to reflect expected changes in the level of consumption. Provincial and regional level clinics can use the guidelines (in Table 26:1) to verify their calculations.

Monitor both supply levels (to make sure you never run out of supplies or are overstocked) and the level of consumption (to see whether demand is changing for any method). Periodically calculate the *average monthly consumption* for the past 6 months. More accurate than an estimate, this approach will indicate whether demand is changing, in which case the amount ordered should change correspondingly. For these calculations, the average monthly consumption is used as an approximation of 1 month's supply.

Table 26:1 How to calculate annual supplies for continuing and new family planning clients

Method	Guideline
Pills	15 cycles per continuing user per year, or 7.5 cycles per new user in the current year
Condoms	120 units per continuing user per year, or 60 per new user
Intrauterine device (IUD)	1.5 IUDs per new user
Injectables	4 units of Depo-Provera per continuing user, or 2 per new user 5 units of Noristerat per continuing user, or 3 per new user
Norplant	One set of implants per new user
Sterilization kits	2 per doctor

The Maximum/Minimum System

Using the Maximum/Minimum (Max/Min) inventory control system is a way of making sure that supplies never run out or, on the other hand, that there is never so much stock on hand that some contraceptives expire before they can be used. In the Max/Min system, maximum and minimum stock levels are set for each facility or type of facility. These levels are expressed in number of months of supply (for example, a clinic might have a minimum of 2 months of supply and a

maximum of 4) so that the right levels are maintained even if demand changes (that is, if the amount in the average monthly consumption increases or decreases). Thus, for example, if demand increases, a maximum amount of months of supply might grow from 400 pills cycles to 600, even though the maximum remains set at 4 months.

In the Max/Min system, the *minimum level* is equal to the *safety stock*, the amount held in reserve in case of higher than usual demand. Some family planning programs set the minimum level at safety stock plus the *lead time stock* (the amount of stock used during the time between placement of an order and when it arrives).

The *maximum level* is the largest quantity the facility should ever keep in stock. This level is set by adding the quantity that will be used in the time period between routine orders to the minimum stock level. For example, a clinic with a minimum level of 2 months of supply and an average monthly consumption of 1,000 condoms that was resupplied every 3 months would need a maximum balance of 5,000 condoms (2 months of minimum balance plus 3 months of consumption at 1,000 condoms per month).

Once the minimum and maximum levels are set, ordering supplies is fairly easy. Stock levels are reviewed periodically, and an order is placed to bring the level back up to the maximum.

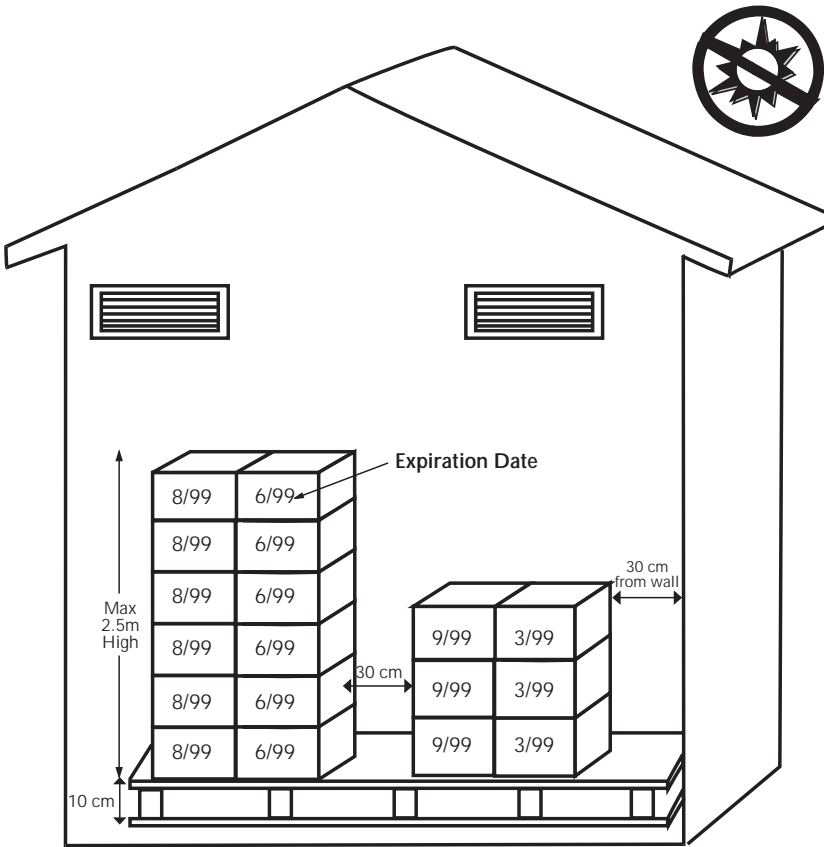
STORING CONTRACEPTIVES

Contraceptive supplies should be stored in a dry, well-ventilated area. They should be kept cool and protected from direct sunlight. Generally speaking, if the storage space is comfortable for human occupation, it will be adequate for storing contraceptives. If new warehouse space is being set up, remember that the program may expand; provide enough room to store the quantities of contraceptives the program will need in the future.

In facilities that serve as depots and store large quantities of supplies, all boxes should be marked with the expiration date of the contraceptives that the boxes contain, and the *first-to-expire, first-out*

(FIFO) system should be used so that contraceptives are distributed and used long before they expire. Supplies should be organized by year and month of expiration, with supplies that are closest to expiration placed to the front and distributed first.

Figure 26:1 Model for storing contraceptive supplies



Contraceptives have a limited shelf life; make sure they are not dispensed if they have expired. (See Chapter 27, Providing Quality Family Planning Services, for more detail.) If stored under adequate conditions, they should have the following shelf lives:

- Pills—5 years from date of manufacture
- Condoms—3 to 5 years from date of manufacture
- IUDs—7 years
- Injectables—4 to 5 years
- Implants—5 years
- Foaming tablets—3 to 5 years

Guidelines for Proper Storage

- *Clean and disinfect storeroom regularly.*
- *Store contraceptives in a dry, well-lit, well-ventilated storeroom out of direct sunlight.*
- *Secure storeroom from water penetration.*
- *Make sure fire safety equipment is available and accessible.*
- *Store cartons of condoms away from electric motors and fluorescent lights.*
- *Stack contraceptive cartons at least 10 cm (4 inches) off the floor, 30 cm (1 foot) away from the walls and other stacks, and no more than 2.5 m (8 feet) high.*
- *Arrange cartons so that identification labels, expiration dates, and manufacturing dates are visible.*
- *Store contraceptives in a manner accessible for the first-to-expire, first-out (FEFO) system, for counting and for general management.*
- *Store contraceptives separately (away from insecticides, chemicals, old files, office supplies, and other materials).*
- *Separate and dispose of damaged or expired contraceptives without delay.*

DOCUMENTING STOCK FLOW

To always have the right amount of contraceptives on hand, you need to know two things: how much stock you have, and how much is being dispensed. You must keep track of this information through records and reports. Two kinds of records are needed: stockkeeping and transaction. *Stockkeeping records* are stock inventory control cards on which, for each method and brand, information is recorded on all receipt and shipment activities, any adjustments made to supply levels after physical inventories, and any additional records for accountability and prevention of theft. *Transaction records* are used to record the amount of supplies shipped from one facility to another and the amounts ordered or dispensed.

Periodically (such as monthly or quarterly), the information from the records should be aggregated into *reports*, which should be used for planning and evaluation. These reports might contain information on the quantities of each type of contraceptive received and dispensed within the time period and the number and types of clients served. Reports are used to forecast needed supplies, assess the demand for the different contraceptives, and track changes in demand. These reports need to be accurate and timely.

COLLECTING, ANALYZING, AND REPORTING INFORMATION

Managers and decision makers at every level of a family planning program need complete and reliable information on the program's performance and operations. A management information system (MIS) is the system of forms and reports used to collect and aggregate essential data about the program's activities. These data are compiled in reports that managers use to monitor the program, make decisions about how to allocate program resources, and analyze the program's performance and the reasons for its success. The reports can also be used to determine ways to improve performance. Although managers often obtain information through informal channels such as observation and informal discussions with colleagues, they also need a well-running MIS.

The MIS should be designed to collect only data that are necessary and that can be easily summarized to produce reports that are complete, accurate, and timely. A good MIS can help managers discover existing and potential problems and make well-informed decisions on topics such as the quantities of contraceptives required and the most appropriate contraceptive method mix to offer.

Managers also need to consider how often data need to be collected and reported. Many programs collect and process data on a monthly basis, although a quarterly basis might serve just as well. One of the problems with monthly systems is that because they take as long as quarterly reports to generate but must be produced three times as often, those responsible for processing the reports can easily fall far behind and become discouraged. It is better to have timely reports of quarterly data than late reports of monthly data; after all, it is of little use to learn in August that many locations were out of certain contraceptives last February.

WHAT INFORMATION DOES A PROGRAM NEED?

In general, managers need performance and operational information.

Performance information is used for planning and evaluating family planning programs. This information is needed to see whether performance objectives are being met, such as keeping waiting times under 2 hours or developing outreach efforts to bring in members of a high-risk segment of the population. There are seven categories of performance information you may wish to collect:

- Family planning client characteristics (age, income, residence [urban or rural], education)
- Fertility characteristics of clients (parity, age at marriage, duration of method use)
- Contraceptive method mix and the sources of supply
- Contraceptive failure and discontinuation of use

- Quality of services (See Chapter 27 on Providing Quality Family Planning Services)
- Level of community participation in and support for the program
- Contraceptive prevalence

Most program performance information is expensive to collect because it must be obtained from surveys and client records; not all programs need complete performance data. The information is used to develop the program's goals and objectives, determine subgroups that may need targeted services, and evaluate the program's impact and reputation.

Operational information, which provides information on how the program uses time, people, money, and other resources, is used to assess how well a program is functioning. For example, is every client receiving human immunodeficiency virus (HIV) counseling? Are all client complaints addressed? Operational information includes the following data:

- How well work plans are being implemented (activities accomplished, objectives met)
- Costs and expenditures (whether the program is within budget)
- Contraceptive logistics (shortages, situations of oversupply, changes in consumption)
- Staffing and supervision (staff shortages, need for training)

WHAT INFORMATION DOES YOUR PROGRAM COLLECT?

Common problems with an MIS are that it collects too much information and is too complex. An MIS should collect only the information that managers need to make well-informed decisions about the program. To make sure your MIS is collecting this information and *only* the necessary information, follow these steps:

1. Review the goals and objectives of the organization, program, department, or service delivery site where you work, and determine what information is needed to assess whether those goals and objectives are being met.
2. Identify all the people who are or should be using each type of information (clinic workers, clinic managers, supervisors, volunteers, etc).
3. After identifying what information is needed by the different staff, eliminate the information that is being collected but is not being used.
4. Review the current forms and procedures for collecting, recording, tabulating, analyzing, and reporting the data and determine whether anything in these forms is difficult to understand or fill out (past errors or problems using these forms could serve as a guide).
5. Revise the existing forms and procedures for collecting and recording information to make them easier to use.
6. Set up or improve the manual or computerized systems for tabulating, analyzing, and reporting information so that they are useful for the employees who work with them.
7. Develop procedures that check the accuracy of the data.
8. Train and supervise staff to use the new forms and procedures.

INFORMATION FLOW

Information flow is the movement of information within the organization. In family planning programs, information should flow from the service delivery level up to the top management level; feedback should then be sent back down the line to service delivery staff. The kind of information and the format in which it is presented (e.g., tables, charts, reports, graphs) should be determined by the following criteria:

- Who needs the information
- How the information is used
- What level of detail is needed at each administrative level

The level of detail and the format should always be appropriate for the needs of the particular information users. As information moves up the administrative ladder, the amount of detail decreases. The clinic manager needs to know the details of the clinic's operations, but the head of the organization or department does not.

The MIS is ultimately based on the routine data that are collected at the lowest level. Routine data are obtained from various sources by using several types of data collection instruments:

- Individual client records (see Form 1 at the end of this chapter)
- Daily activity registers of family planning clinics (see Form 2 for an example)
- Clinic contraceptive service registers

A family planning program also requires administrative data, which can be collected using the following instruments:

- Stock card or contraceptive supplies inventory form
- Record of a supervisory session
- Financial records (income and expense reports)

REPORTING INFORMATION

Once collected, the data need to get to the appropriate staff members in a form they can use (generally in reports of some kind). Mechanisms are needed to take the following steps:

- Summarizing what has been collected in the records, registers, and forms
- Analyzing the data so that it can be transformed into usable information

- Transmitting the summarized data to others in reports that can be clearly understood

In the first step, data are summarized as totals, percentages, and averages. (See Form 3 and Form 4 at the end of this chapter for examples of such summaries for client visits and contraceptives dispensed.) In many cases these summaries may provide all the information that is needed to make decisions. In step two, analysis is conducted by aggregating data from similar service delivery sites to get a broader perspective. (See Form 4, which could be used at a regional warehouse.) Charts and graphs can make the information even easier to understand, especially when looking at changes over time.

In the third step, supervisors provide feedback. Supervisors should let the staff know how well they have reported information (this means letting them know when they are doing a good job, not just bringing up problems) and how the information is being used. Feedback lets the staff know that the supervisor appreciates the effort they have made and demonstrates how valuable the reports are to the supervisor. By acknowledging a job well done, the supervisor can help ensure that the MIS continues to provide complete, timely, and accurate information for decision making.

As a final step, supervisors should check that appropriate decisions or actions have been made based on the information produced by the MIS. When reviewing the reports, each supervisor should ask these questions:

- Is the information in the reports accurate and reliable?
- Have all gaps or insufficiencies in the data been identified?
- Have the data been interpreted and the conclusions included in the report?
- Does the report indicate decisions made or actions taken based on the reported information?

In summary, to see whether your current MIS is effective, evaluate the process:

- Is all the information being collected actually necessary?
- Is the information collected on a routine, ongoing basis?
- Does the MIS operate at all levels of the system?
- Does the MIS contain a mechanism for regular feedback?
- Are reports produced in a timely fashion?

Remember the most important rules of a MIS: Make sure you have a reason for collecting each item of information, and make sure the information you collect is up-to-date, reliable, and accurate.

MEETING THE NEEDS OF THE CLIENT

The driving force of every decision and action should be a desire to meet the needs of the family planning client. For example, when deciding what hours of operation the clinic should have, consider the convenience of the clients. When setting up the waiting rooms, determine what would make the clients most comfortable both for waiting to be seen and for receiving information. This client-focused approach to service delivery is discussed in more detail in the following chapter.

RESOURCES

1. Dwyer J, Jezowski T. Quality management for family planning services: practical experience from Africa. AVSC working paper. New York, NY: Association for Voluntary Contraception, 1995.
2. Owens RC, Warner T. Concepts of logistics system design [internal paper]. Boston, MA: John Snow, 1992.
3. Robey R, Piotrow PT, Soultter C. Family planning lessons and challenges: making programs work. *Popul Rep* 1994; Series J(40).
4. Wolff JA, Suttentfield LJ, Binzen SC (eds.). *The family planning manager's handbook: basic skills and tools for managing family planning programs*. Hartford, CT: Kumarian Press, 1991.

Form 1

The Individual Record System
Client Record, Page 1

[Empty box for Client Reg. Number]

Date ___/___/___ Client Reg. Number [Empty box]

Family Planning Client Record

DO NOT FILL THIS FORM FOR CASUAL NON-PRESCRIPTIVE USERS

Clinic Name _____

Family Name _____

Given Name _____

Address (or directions to reach home) _____

Age :___ (Estimate if not known) Birth date _____

Education: ___ None _____ Some Secondary

_____ Some primary _____ Secondary completed or more

_____ Primary completed

Religion: _____ Moslem _____ Christian _____ Other

Reproductive History:

_____ No. of children born alive

_____ No. of children still living

_____ No. of miscarriages/stillbirths/abortions

Month/year last pregnancy ended: ___/___

Result of last pregnancy: _____ Normal _____ Complicated

Specify complication: _____

Menstrual Cycle: _____

Duration: _____

_____ Regular _____ Irregular

Date of Last Menstrual Period: _____

Are you currently breastfeeding? _____ Yes _____ No

Do you want to have more children?

_____ No, wants no more children

_____ Yes, but wants child later (spacing)

_____ Not certain or counseling only

_____ Yes, wants child now

Contraception used prior to this visit?

_____ No _____ Yes (Specify most recent method used)

Method: _____

Source: Public _____ Private _____ Other _____

Client Reg. Number

Family Name

Form 1 (Continued)

Client Record

Note here any serious illnesses or condition:

Diabetic..... Yes _____ No _____
 Jaundiced..... Yes _____ No _____
 Frequent urinary tract infection or dysuria..... Yes _____ No _____
 Frequent or severe headaches..... Yes _____ No _____
 Sickle Cell Anemia..... Yes _____ No _____
 Other serious illness or condition..... Yes _____ No _____

If yes, specify in box above

Smoker: ___ Yes ___ No

INITIAL MEDICAL EXAMINATION (Only for those selecting IUD, hormonal, diaphragm, or sterilization methods)

Blood pressure: _____/_____ Weight: _____ (kg)

Breasts: ___ Normal ___ Lumps

Liver enlarged: ___ Yes ___ No

Vaginal discharge: ___ Yes ___ No

If yes: Color _____ Odor _____

Cervix: Erosion ___ Yes ___ No

Discharge ___ Yes ___ No

Tears ___ Yes ___ No

Uterus position: _____ Anteverted _____ Retroverted

Size: _____ Normal _____ Enlarged _____ Other

Laboratory results (as appropriate): _____

Other observations: _____

Contraceptive selected this visit: _____

Brand/Size _____ Quantity _____

Date of next appointment _____

Name of examiner _____

Pregnancies that occur after initial clinic visit

Date pregnancy ended: _____/_____/_____ Pregnancy outcome:
 Live birth _____ Miscarriage _____

Stillbirth _____ Live birth died later _____

Complication _____

_____/_____/_____ Live birth _____ Miscarriage _____

Stillbirth _____ Live birth died later _____

Complication _____

Form 3

Summary of Family Planning Users & Contraceptives Issued/Dispensed

Location Code Date of Report ____/____/____

Clinic _____ District _____ Region _____

Reporting Period: From ____ (month) ____ (day) ____ (month) ____ (day) ____ (Year)

Clients:	Number of Client Visits		Oral Contraceptives		IUDs		Injection		Vaginal		Other				
			Lo-Femeral	Other	Copper T	Other IUD	Depo-Provera	Nortrelat	Famring Tablets	Creem Jelly, Foam	Condoms	Norplant	Female Sterilization	Other	"No-Method" Visit
New Acceptors															
Revisits															
Total Visits															
Commodities:															
Beginning Balance															
Amount Received															
Amount Dispensed/Issued															
Ending Balance															

Form 4

Contraceptive Supply Status

Location Code Date of Report ____/____/____

Name of Location _____ Region _____ District _____

Reporting Period: From (month) _____ To (month) _____ (year) _____

Contraceptive Method	Beginning Balance	Received	Dispensed, Issued	Ending Balance	Requested	Issued
Lo-Femenal						
Ovrette						
Other Oral _____						
Copper T IUD						
Other IUD _____						
Depo-Provera						
Noristerat						
Foaming Tablets						
Cream, Jelly, Foam						
Condoms						
Norplant						
NFP Kit						
Other _____						
Other _____						
Other _____						

Providing Quality Family Planning Services

Veronica is from a small African village and has come to the family planning clinic in a nearby town. Her sister came last year and was given an IUD. Veronica thinks she would like one also, because her sister is happy with hers. After signing in at the clinic, she is told she can expect to wait 30 minutes before seeing the nurse. While waiting, Veronica looks at the posters on the wall that explain the different types of family planning methods and the benefits of family planning. After Veronica tells the nurse that she is there for an IUD, the nurse asks her several questions to find out whether the IUD would be a good method for her and to see whether Veronica is interested in considering the other methods the clinic offers. After discussing the various methods, they both agree that the IUD would be the best method for Veronica. However, the nurse asks Veronica to come back another day for the IUD insertion because the clinic has been out of IUDs for 2 weeks. Because the regional warehouse sends the truck only every 3 months to deliver supplies, the nurse gives Veronica an appointment the next month and gives her some condoms to use in the meantime. Veronica is disappointed and feels embarrassed to ask the nurse how to use the condoms or how to ask her husband to use them. Also, the nurse seems in a hurry to see the next client. Veronica never uses the condoms and does not come back for her appointment, because she suspects the clinic will still be out of IUDs and because it is difficult for her to get away and come to the clinic.

To help women and men have the number of children they want, family planning providers must do more than just provide information, services, and contraceptives. They must provide *good or quality* services and contraceptives to safeguard the health of their clients and ensure their satisfaction with the family planning services. Client satisfaction with services is very important; when clients are happy with the services they receive, they are more likely to continue using them and practicing family planning.

Many of the principles for improving the quality of services provided by family planning and health clinics will also apply to community health workers and to community-based distribution programs. The general guidelines presented in this chapter should be adapted for the specific program of interest. Administrators of each program or clinic must define "quality" services based on the organization's mission, the number of staff members and their skills, the technical resources available, the client population, and the social, cultural, and political environment in which it operates. Improvements, great or small, can be made at any organizational level.

Some family planning providers may find it difficult to implement some of the suggestions for providing ideal services because they are restricted by inadequate facilities or by shortages of staff, equipment, supplies, electricity, bathrooms, or even water. Whatever their circumstances, family planning providers should always provide the best care they can. Contraceptives dispensed by a provider, however, must *always* be of good quality; the health of the clients depends on it.

PROVIDING GOOD-QUALITY SERVICES

WHAT IS "QUALITY"?

Good-quality services have the following characteristics:

- The service providers are technically skilled and follow clinical guidelines
- The service providers treat the clients with respect and consideration
- The clients are satisfied with the services they receive

Ask the staff at the service delivery site to describe what they think quality services are and the conditions that are necessary for quality services to exist.¹ They will likely have ideas of how things can be improved, and if they are involved in evaluating the services, they will better understand the changes that will take place to improve the services.

The quality of services can be assessed both objectively and subjectively. To assess services objectively, begin by asking the following questions. (More detailed evaluation questions appear in Table 27:1).

- Is a full range of contraceptive methods (short-term, long-term, and permanent [female and male sterilization]) available?
- Do the service providers try to understand the clients by asking them about their background, attitudes, preferences, contraceptive history, reproductive health, and childbearing plans?
- Do clients receive full information on all contraceptive methods, including the precautions, possible side effects, and effect on sexual practice, as well as instructions for correct use?
- Do service providers let clients know what assistance they will provide with each method in terms of advice, additional supplies, handling side effects, and switching methods?
- Are the service providers technically competent?
- Do the service providers follow the clinic's guidelines for care, including infection prevention?
- Do the service providers encourage continuity of contraceptive use by making it easy for the client to obtain supplies, providing care in case of side effects, or helping them switch to another method?
- Do service providers treat clients with respect, empathy, and understanding? Do they encourage clients to ask questions? Do service providers respect the clients' privacy and preferences?
- Are the services accessible to the client (i.e., relatively easy to get to, open at convenient times, affordable, and not requiring too long a wait)?

Because family planning services must be safe, all clinical and medical standards and protocols must be met. Ideally, the clinic or other service delivery point should be fully staffed with adequately trained providers and have the equipment, materials, and supplies necessary for safe services. The medical history of individual clients should be available to the service provider.

To assess the services subjectively, begin with these questions:

- Are the clients satisfied with the services they receive and the way they are treated?
- What changes would the clients like to see in the way services are provided?
- Are the clients satisfied with the contraceptive methods they are using?

It is better to ask these questions of the clients themselves, but you can also assess a clinic's quality subjectively by looking at it through a client's eyes. For example, if you were the client, would you feel comfortable with the provider and able to ask questions? Would you receive all the information you need to make an appropriate contraceptive choice? Would you be content with the care you received at this facility?

WHY IS QUALITY IMPORTANT?

Everyone should have the right to good-quality services—services that are safe, accessible, and meet their needs. Good-quality services are much more likely to keep clients coming back and to attract new ones. Satisfied users are an important source of information for people interested in family planning, and they contribute to a family planning program's success.⁴ In the long run, providing good-quality services will increase contraceptive prevalence and will make the program more cost-effective.²

As the opening story illustrated, a number of factors are involved in providing good-quality services. In the story, the clinic tried to pro-

vide quality services and actually succeeded by a number of indicators: the wait was not too long, informational material was available, and the nurse was trained in family planning and followed protocol by discussing all the methods with Veronica and providing her with condoms when the method she chose was not available.

However, some elements of good care were missing or not working properly: the lack of intrauterine devices (IUDs) meant Veronica could not get the method she wanted right away; the nurse was too busy to take the time to make sure Veronica understood how to use the condoms or to encourage her and answer her questions; and the clinic did not have a follow-up process to contact Veronica about her missed appointment. Veronica, who was motivated to seek family planning services, found her needs unmet.

This clinic could raise the quality of its services by (1) improving its contraceptive ordering procedures to avoid running out of supplies, (2) stressing to service providers the importance of following guidelines and of focusing on the individual client's needs, and (3) developing a tracking system that allows the clinic to track and contact clients who miss appointments (perhaps through an outreach program).

GUIDELINES FOR IMPROVING THE QUALITY OF SERVICES

Quality family planning services have the following features:

- Technically skilled service providers
- Good staff morale
- Clear and relevant service delivery guidelines
- Responsiveness to the clients' needs and concerns
- Accessible services
- Good records
- Encouragement of continuing contraceptive use
- Full range of reproductive health services

TECHNICALLY SKILLED SERVICE PROVIDERS

The service provider must be technically competent to help clients use contraceptive methods safely and avoid health risks. If the quality of the services is not as good as it could be, it may be that providers are overworked and lack time to deliver services according to guidelines, or they may not be properly trained to deliver a particular service.

When selecting new service providers, make sure the provider is able to carry out the tasks required. A job description that outlines the employee's tasks and responsibilities, what her or his authority is, and what skills or qualifications are necessary to do the job is useful to both the supervisor and the employee.

Make sure the current staff are well trained and capable of delivering the services they provide. The supervisor can assess the need for staff training by comparing the staff member's skills with the skills listed in the job description and the skills necessary to follow clinic protocols. When training is necessary, provide it on-site whenever possible to ensure it is relevant to the staff members' jobs, and involve the supervisor so that she or he can follow up later. Refresher training should also be provided when necessary.

GOOD STAFF MORALE

To help the providers do their best and to keep up morale, supervisors should guide, support, and assist the providers:

- Provide on-the-job training when necessary.
- Convene regular staff meetings to keep everyone informed of activities, policies, changes, and developments.
- Meet with staff to develop and review work plans and discuss problems.
- Provide staff with feedback (positive as well as negative) on their work performance and with continuing education opportunities.

- Listen to the staff's concerns and ideas on how services could be improved, and be aware of what the staff says it needs to provide quality services.

CLEAR AND RELEVANT SERVICE DELIVERY GUIDELINES

Every service provider must have and follow service delivery guidelines to ensure that all clients receive medically safe, well-informed care that meets their needs. These guidelines should be part of a clearly written manual available to all health workers. The guidelines should encourage staff always to consider their client's needs and preferences, try to understand them, and then do their best to meet them.

The guidelines, which should not present medical or logistical barriers to service, should include the following:

- Directions on checking clients for appropriateness of each contraceptive method
- Specifications for inserting, injecting, or dispensing each method of contraception
- Instructions for when and how to refer cases
- Instructions for managing complications and unusual medical conditions
- Standards of hygiene and infection prevention
- Guidelines for monitoring the quality of contraceptive products (what defects to look for)

RESPONSIVENESS TO CLIENTS' NEEDS AND CONCERNS

By informing and counseling clients, the provider helps them choose the best family planning methods. Providers must be skilled in counseling, listening to, and communicating with all clients in a non-judgmental way.

The relationship between client and provider should be one of mutual trust, which requires honesty and respect for all clients, whatever their level of education, economic status, ethnicity, religion, or sex. The provider should do the following:

- Give complete information that is accurate, unbiased, and culturally appropriate.
- Provide a full range of methods from which to choose.
- Encourage clients to ask questions and respond in a non-judgmental way.
- Use appropriate materials as teaching aids and outreach.
- Listen to clients to learn their needs, concerns, and preferences.
- Document complaints and other forms of client feedback, and address them when possible.

In addition, service delivery sites should occasionally use "customer interviews" to solicit feedback from their clients on how services could be improved.

ACCESSIBLE SERVICES

Clinic settings not only need to offer good-quality services but also need to be accessible in distance, cost, and hours of operation. The following characteristics describe an acceptable and accessible clinic setting:

- The waiting area is large enough and has sufficient seating for all clients, is pleasant, and has informational activities or materials.
- Service is prompt.
- Rooms and equipment are clean and organized.
- The clients have privacy for counseling and examination.
- Ventilation is adequate.
- Toilet facilities with water are available.
- Signs and directions clearly indicate how to get to the clinic and find one's way once there.

- The clinic's location is known and convenient to the client.
- Clinic hours are convenient for clients and are well posted.

If family planning services are provided in a location where other health services (such as obstetric or pediatric care) are provided separately, each of the services should cooperate in letting clients know of all the other services.

GOOD RECORDS

Three kinds of data need to be collected at each service delivery point for the clinic to provide high-quality services.

Client medical record

Collect information on the client's health status to determine that a certain method might not be suitable and to help the client make an informed decision when she or he is choosing a contraceptive method. The medical record containing this information needs to be available for charting every time the client returns to the clinic.

Service statistics

Collect information on all the services the program provides so that both the clinic and the upper management of the family planning program can monitor the clinic's performance and identify and resolve any problems.

Contraceptive supply information

Collect information at the service delivery level on contraceptive supplies, both what is in stock and what is being dispensed, and promptly report this information. Doing so will help ensure that adequate supplies are always on hand and that accurate forecasts can be made of future need. (For more information, see Chapter 26 on Effectively Managing Your Family Planning Program.)

Collecting all of this information is just the first step; the information must be used. Review the client's medical record at each visit. Promptly report information on services provided to the next highest level of the program. Review information on supplies to make sure an adequate stock level is maintained, and report to higher program levels as required.

ENCOURAGEMENT OF CONTINUING CONTRACEPTIVE USE

Some contraceptive methods (such as the pill, condoms, and injectables) require the client to return periodically for more supplies. These resupply visits should be as easy and brief as possible while still providing the necessary medical care (such as checking blood pressure or asking about side effects). Clients coming only for resupply should be able to get their supplies quickly without going through the usual clinic procedures, such as counseling.

Clients are more likely to continue practicing family planning when the program has a good follow-up system. Following up means contacting the clients to make sure they understand how the method works and what side effects to be aware of, answering any questions, and helping them make informed decisions about their fertility. These tasks are sometimes carried out in community-based distribution programs that regularly visit clients at home, but follow-up systems can take other forms:

- An appointment or reminder system
- Monitoring "drop outs" from the program
- A home visit outreach system

Because well-informed clients are more likely to continue practicing family planning, providers should make sure that clients know at least the following about the contraceptive method they use:

- How to use it correctly
- Its benefits
- Possible side effects
- How to get additional supplies

- What examinations are necessary for that method
- The need to have regular reproductive health exams (Papani-
colaou smear or blood tests)

Providers should also instruct clients in switching contraceptive methods if they dislike their current method.

FULL RANGE OF REPRODUCTIVE HEALTH SERVICES

Clients will view the program more favorably if all their family planning and reproductive health needs can be met during one visit or at one location. To meet all its clients' needs, an ideal clinic would provide:

- Gynecological care
- Diagnosis and treatment of sexually transmitted infections (STIs)
- Pap smears
- Pregnancy tests
- Laboratory tests
- Infertility diagnosis and treatment
- Prenatal care
- Pediatric services
- Sexuality counseling

Many clinics are simply too small or lack the resources to offer all these services, but comprehensiveness at one site is not necessary. Achieving greater efficiency for its clients is one goal to which every clinic can aspire; where family planning services are offered along with maternal and child health services, for example, clients may be able to take care of their family planning needs and pediatric care in one visit. Service delivery sites should provide only those services that are needed and that they can provide well. For any service that a site does not provide, the staff should be able to refer clients to a site where it is available.

PROVIDING GOOD-QUALITY CONTRACEPTIVES

An essential part of providing good-quality care is making sure that the right contraceptives are available, affordable, and safe to use. Examining the story at the beginning of the chapter, we can say that Veronica did not receive the best quality service because she was unable to obtain the method she had chosen. For clients to receive good-quality products when they need them, a program needs to have an efficient, well-functioning supply system with the following elements:

- Storage consistent with family planning guidelines (see Chapter 26)
- Timely reporting
- Accurate forecasting of contraceptive needs
- Timely response to requests for supplies
- Monitoring of product quality

To properly and efficiently manage a contraceptive logistics system, accurate and up-to-date information is needed on the contraceptive supplies, such as the amount of contraceptives in storage, where they are stored, and at what rate they are being dispensed. Every program needs a simple, well-designed logistics management information system, whether manual or computerized, to ensure both the availability and the quality of contraceptives.

Managing contraceptive supplies requires the following cycle: *planning* for program needs, *procuring* the contraceptives, *distributing* them to service delivery points, and *dispensing* the contraceptives to the client. There are quality considerations at every stage of this cycle.

In the planning stage, select an appropriate mix of products that takes into consideration the preferences and needs of the clients, such as a progestin-only pill for lactating mothers or preferred brands of condoms for preventing human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs). Accurately estimate the quantities that will be needed to avoid understocking or overstocking contraceptives. (See Chapter 26 on Effectively Managing Your Family Planning Program, for more information on forecasting contraceptive needs.)

The procurement stage, which applies only to the top (central) level of a family planning program, involves ordering contraceptives from the manufacturer. During the distribution stage, the central level of the program is responsible for checking and maintaining the quality of the contraceptive products as they are received from the manufacturer, stored in warehouses, and ordered by and transported to lower-level warehouses or service delivery points. Storing and transporting contraceptives in hot or humid environments or where ventilation is poor is always cause for concern, as these conditions can damage the quality of contraceptives. Ensuring contraceptive quality requires following sound warehouse practices (see Chapter 26) and developing a system to monitor the quality of contraceptives at each step on the way to the client. As a final check, service providers should visually check the quality of the contraceptives when they dispense them to the client.⁵

GUIDELINES FOR ENSURING THE QUALITY OF CONTRACEPTIVES

- Monitor the shelf life of contraceptive products so that clients receive them well before the expiration date.
- Conduct regular visual inspections to look for damage or deterioration.
- Request laboratory testing when deterioration or poor quality is suspected.
- Document all product quality problems.
- Follow disposal guidelines if contraceptives are unfit for use.

Both during visual inspections and when contraceptives are dispensed, program staff and service providers should look for the warning signs described below. Service providers should also perform a final check as they dispense the contraceptive to the client to make sure it has not expired. Expiration or manufacture dates are generally stamped on the outside box in which contraceptives are shipped, on the inside box, and on the individual contraceptive package.

Contraceptive shelf life and visual warning signs

Oral Contraceptives

Shelf Life: Usually 5 years

- Check to make sure the blister or foil packaging for each packet of pills is not broken, that all pills are in the packet, and that all the pills have the correct color and are not cracked. If any of these problems are present, do not give these pills to clients.
 - Check the room temperature. Oral contraceptives supplied by the U.S. Agency for International Development have a shelf life of 5 years when stored at room temperature (15 to 37° C) in dry conditions. Check the shelf life of oral contraceptives from other sources.
 - If there is any question about the hardness of a batch of oral contraceptives, push a pill through the aluminum backing. If it crumbles, do not give these pills to clients.
 - If there is any problem with one of the packets, check to see whether other packets in the box also have the problem.
 - Check to see that there is a sheet containing instructions and information on pill type and dose in each packet. If a packet is missing this information, it should be given to clients only after making sure the client is familiar with the information on the missing sheet.
-

Intrauterine Devices (IUDs)

Shelf Life: 7 years*

- IUDs should be kept away from heat or direct sunlight.
 - Check for any breaks in the sterile packaging. If you find any breaks or holes in the sterile seal, do not use this IUD unless it is chemically sterilized again immediately before insertion.
 - Check to make sure all the product contents are in the sterile wrapper. If anything is missing or broken, the IUD is not safe for use.
 - **IMPORTANT:** The copper on some IUDs sometimes gradually darkens. This is normal and happens because of oxygen in the air surrounding the IUD in the package. Darkening has not been shown to have a clinical effect. As long as the device is within its shelf life and the packaging is intact, the IUD can be used.
-

Injectables

Shelf Life: 4 to 5 years*

- The contents of the vials will stay effective until the expiration date if they are stored at 15° C to 30° C. Refrigerate the vials if the manufacturer specifies that this be done.
 - If the contents of the vial separate, shake the vial just before using it.
-

Contraceptive shelf life and visual warning signs (Continued)

Condoms

Shelf Life: 3 to 5 years

- Check the condom packages for discoloration, yellowing, or damage to the package seal. Any of these signs indicates that the condom's quality and thus its effectiveness may have diminished and that it cannot be used reliably.
 - Warning signs that a condom is of poor quality are hard to find. Be aware of the conditions where latex condoms are stored because these condoms will deteriorate if they are exposed for long periods to any of the following:
 - Sunlight
 - Temperatures above 40° C
 - High humidity
 - Electric motors (because they generate ozone)
 - Fluorescent light
 - Petroleum vapors or other types of liquid solvents
 - Condoms that come into contact with petroleum, mineral, or other household oils will be damaged. These oils should not be used for lubrication or in any other way in which the oil touches the latex condom.
 - The shelf life of condoms varies because the latex can be damaged by extreme environmental conditions. In hot, humid areas in Africa, closely examine the quality of condoms that are more than 2 years old.
-

Hormonal Implants

Shelf Life: 5 years[†]

- If the sterile seal enclosing the rods is broken or if any of the rods is missing, do not use this package of implants.
 - Check to make sure the implants are protected from excessive heat, direct sunlight, and moisture.
-

Diaphragms

Shelf Life: Variable

- Do not use diaphragms if they are cracked or have any holes, even very small ones. Check for holes by holding the diaphragm up to the light.
 - Once the diaphragm has been given to the client, the quality should be checked every 2 years and the diaphragm replaced, if necessary.
-

Spermicidal Jelly

Shelf Life: 3 years

- Check the jelly tube. If you find wrinkles or leaking or cannot get the applicator to screw easily onto the tube, do not give the tube to the client.
 - Check to see the package has instructions on how to use the product correctly.
-

Contraceptive shelf life and visual warning signs (Continued)

Spermicidal Foam

Shelf Life: 3 years

- Check the storage conditions to make sure the can is not exposed to intense heat or extreme fluctuations in temperature or humidity and that it is stored upright at temperatures below 50° C. Because the contents in the cans are under pressure, the cans should not be punctured or burned.
 - If you suspect the foam's quality has deteriorated because of poor storage conditions, damaged cans, aging, or complaints from clients, follow the instructions and spray some in your hand. Check the foam to make sure it is the right consistency and color and comes out of the can the way it should. Most brands come out white and foaming.
 - Check to see the package has instructions on how to use the foam correctly.
-

Foaming Tablets

Shelf Life: 5 years

- Feel through the packaging to see whether the tablets feel soft or crumbly or if the packaging is puffy; if any of these conditions are present, the tablets should not be dispensed.
 - If there are broken or missing tablets or tablets that have a different color, do not give this package of foaming tablets to a client.
 - Make sure the information on the boxes or packages is the same as the information printed on the tablet packaging.
-

*Follow the manufacturer's expiration date, as different products have different shelf lives.

† The Norplant implant has a shelf life of 5 years from date of manufacture, provided the sterile plastic pouch is not damaged or opened. Norplant will remain stable if stored at temperatures ranging from 20° to 50° C, but it is essential that the product be stored in a *dry* location. Once inserted, the implants have a 5-year effective use life.

Sources: Wolff et al. (1991); CDC (1993)

VISUAL INSPECTIONS

Ideally, a visual inspection of contraceptive quality should be conducted when the following events occur:

- The central warehouse receives the product from the manufacturer.
- The regional warehouse receives the product.
- The clinic receives the product.
- You wish to conduct a periodic inventory or you are monitoring quality.
- You are investigating complaints about quality.
- The product is about to reach its expiration date or shows signs of damage.

At the clinic level, a visual inspection must also be done. You should do the following:

- Examine all the package levels (carton, box, and unit) for damage.
- Make sure that information inserts (with information for the user and the clinician on the product and its use) accompany the product.
- Check for shelf life information (date of manufacture or expiration).
- Check for tracer information (the lot number and name of manufacturer).

Contraceptives are shipped by the manufacturer in cartons. Each carton contains a number of boxes, and each box contains a number of units of that contraceptive. The amount of contraceptives produced at one time under the same conditions is known as a lot or batch. Each lot or batch has its own identity code.

To check contraceptive quality, begin by looking at the condition of the carton and the labels on the outside of the carton. If there is a problem, check inner boxes for damage and then the boxes inside of that; go all the way until you have checked the individual product. (As you check for package damage, also check products for correct labeling.)

If there is no reason to suspect problems with quality, check only a few individual products (a strip of condoms, a couple of packets of pills, etc.) for problems rather than checking a larger sample.

If there is reason to suspect the quality of the product because of any of the problems listed above or because of complaints about the product, sample more of the products. There is no simple rule for how many to sample. Use your judgment and consider taking samples from different boxes, locations, storage conditions, or different dates of manufacture. The reason for conducting a visual inspection (for example, as a routine inventory check, because complaints need to be investigated, or because storage conditions are poor) will be a factor in deciding how many to sample. A routine inventory usually involves collecting a smaller sample than does an inspection because of poor storage conditions or complaints.

LABORATORY TESTING

Usually, the only laboratory testing performed for contraceptives is done by the manufacturer and takes place before the products are shipped. Most laboratory tests for contraceptive products require sophisticated equipment and can be expensive. If clients complain about products and a visual inspection does not identify the cause of the problem, laboratory tests may be requested by appropriate professional authorities, usually from the central level of the program.

DOCUMENTING COMPLAINTS

Any time a client reports a problem with a contraceptive, the complaint should be taken seriously and recorded. Family planning service providers should let clients know their complaints are heard while also making sure the client understands how to use the method correctly and that the problem is not caused by improper use. Providers should keep a well-documented file of complaints about contraceptive products.

Examples of complaints include clients reporting side effects or describing problems with contraceptive use or effectiveness, staff noting the lack of information inserts that are supposed to accompany a product, or warehouse personnel saying they cannot identify the manufacturing or expiration dates. The purpose of documenting complaints is to find the cause of the problem and correct it. To accomplish this, clinic staff must not only document complaints but also report them up the chain of command so that regional or central administrators are aware of the problem and can compile information that will help them trace the cause and take corrective action.

Keep a record of the number of complaints and the details of the problem. Descriptions of the product will help to isolate the problem:

- Method
- Brand
- Manufacturing or expiration date (printed on individual contraceptive unit package)
- When and where it was dispensed to the client
- The lot number of the product, if possible (this lot number is generally printed on the outside carton, the inner box, and the unit package)
- Any circumstances that may be pertinent to identifying the extent and nature of the problem, such as unusual storage conditions

The lot number of the product is used to trace problem products. For example, suppose clinics report that clients have complained of condoms breaking during use. While documenting the brand and expiration date, program staff find that the problems are all with one brand. At this point, the clinics can continue to supply other brands to their clients while investigating the brand in question. If the defective condoms all turn out to have the same lot number, the program should not dispense from that lot of condoms while the lot is sampled and sent for testing (however, the program could dispense condoms of that brand from other lots). Results from the laboratory testing will determine whether that lot of condoms is safe to dispense or should be destroyed.

PRODUCT DISPOSAL

Contraceptive products need to be destroyed when they reach their expiration date, are severely damaged, or testing shows they are not effective. Disposal should follow local regulations and, if the products were donated, donor regulations. Disposing of unsafe products ensures they cannot be mistakenly dispensed or recovered for use or resale. The most common methods of disposal are burning and burying, but laws protecting the environment may prohibit one of these options.

When disposing of products, record the following:

- Product name
- Quantity
- Date of manufacture or expiration
- Lot number
- Date of destruction
- Method of destruction
- Location of disposal
- Authorization
- Witnesses

EVALUATING THE QUALITY OF SERVICES

How do family planning providers evaluate or measure improvements in the quality of their services? Table 27:1 shows some of the questions you can ask about your program to give you an idea of the quality of the services it provides and to establish a base for your evaluation. There are two primary ways of evaluating a program that offer good feedback and are reasonably time-efficient:

Observation

Directly observe services being provided to examine the amount of contact between provider and user, check that specifications are followed, and examine the setting, equipment, and materials. Provide feedback to the staff on your observations, and ask them to make suggestions and discuss problems.

Client response

You can conduct:

- *Exit interviews* with clients
- *Follow-up surveys* of family planning clients (from your own program and others)
- *Interviews* with a sample of women living in the service area
- *Focus group* discussions with clients
- *Analysis* of patient flow and use of provider time

Periodically *review* and *revise* the program's policies to make sure they are aimed toward understanding and meeting the clients' needs. Quality is not a one-time exercise but an ongoing concern and constant responsibility.

Respect for all people is the force behind improving the quality of family planning services. Every client visiting the program has a right to access, choice, safety, privacy, confidentiality, dignity, and comfort. In addition, the client has the right to information from the program and to express an opinion.

Table 27:1 Evaluating quality of services: Guidelines and practices

	Yes	No
Availability of contraceptive methods		
At least 4 contraceptive methods are offered	<input type="checkbox"/>	<input type="checkbox"/>
The clinic offers:		
Intrauterine devices (IUDs)	<input type="checkbox"/>	<input type="checkbox"/>
If No, is there a place to refer clients?	<input type="checkbox"/>	<input type="checkbox"/>
Female sterilization	<input type="checkbox"/>	<input type="checkbox"/>
If No, is there a place to refer clients?	<input type="checkbox"/>	<input type="checkbox"/>
Male sterilization	<input type="checkbox"/>	<input type="checkbox"/>
If No, is there a place to refer clients?	<input type="checkbox"/>	<input type="checkbox"/>
Injectables	<input type="checkbox"/>	<input type="checkbox"/>
If No, is there a place to refer clients?	<input type="checkbox"/>	<input type="checkbox"/>
Norplant	<input type="checkbox"/>	<input type="checkbox"/>
If No, is there a place to refer clients?	<input type="checkbox"/>	<input type="checkbox"/>
The referral system is effective (clients get the services they need)	<input type="checkbox"/>	<input type="checkbox"/>
Counseling		
There are guidelines for providing information on contraceptive methods and helping the client select one	<input type="checkbox"/>	<input type="checkbox"/>
For each available contraceptive method, clients are informed about:		
How the method works	<input type="checkbox"/>	<input type="checkbox"/>
The side effects of the method	<input type="checkbox"/>	<input type="checkbox"/>
How the method is used	<input type="checkbox"/>	<input type="checkbox"/>
Possible danger signs of the method	<input type="checkbox"/>	<input type="checkbox"/>
Where to go for help	<input type="checkbox"/>	<input type="checkbox"/>
How to get additional supplies (if necessary)	<input type="checkbox"/>	<input type="checkbox"/>
There are good visual aids to explain each method	<input type="checkbox"/>	<input type="checkbox"/>
A checklist covers information the provider should discuss during a counseling session	<input type="checkbox"/>	<input type="checkbox"/>
Providers are trained in counseling skills or interpersonal relations	<input type="checkbox"/>	<input type="checkbox"/>
The clients have adequate privacy during counseling	<input type="checkbox"/>	<input type="checkbox"/>

Table 27:1 Evaluating quality of services: Guidelines and practices
(Continued)

	Yes	No
Clinical services		
There are written clinical guidelines for providing each method	<input type="checkbox"/>	<input type="checkbox"/>
The clinical guidelines are strictly followed	<input type="checkbox"/>	<input type="checkbox"/>
The clients have adequate privacy during the examination	<input type="checkbox"/>	<input type="checkbox"/>
Infection control procedures are followed	<input type="checkbox"/>	<input type="checkbox"/>
Providers are adequately trained	<input type="checkbox"/>	<input type="checkbox"/>
If health problems result, the providers are able to treat them	<input type="checkbox"/>	<input type="checkbox"/>
If No, is there a place to refer clients?	<input type="checkbox"/>	<input type="checkbox"/>
New staff are trained in the clinic's guidelines and procedures	<input type="checkbox"/>	<input type="checkbox"/>
Periodic staff refresher training is provided	<input type="checkbox"/>	<input type="checkbox"/>
The following items are available for all service providers:		
Sterilizing equipment	<input type="checkbox"/>	<input type="checkbox"/>
Gloves	<input type="checkbox"/>	<input type="checkbox"/>
Blood pressure equipment	<input type="checkbox"/>	<input type="checkbox"/>
Specula	<input type="checkbox"/>	<input type="checkbox"/>
Adequate lighting	<input type="checkbox"/>	<input type="checkbox"/>
All necessary equipment is available and working	<input type="checkbox"/>	<input type="checkbox"/>
The equipment is sterile when necessary	<input type="checkbox"/>	<input type="checkbox"/>
The equipment is easy to find	<input type="checkbox"/>	<input type="checkbox"/>
The clinic or staff can handle HIV, other STIs, and reproductive tract infections:		
Diagnosis or identification	<input type="checkbox"/>	<input type="checkbox"/>
Treatment	<input type="checkbox"/>	<input type="checkbox"/>
Referral	<input type="checkbox"/>	<input type="checkbox"/>

Table 27:1 Evaluating quality of services: Guidelines and practices (Continued)

	Yes	No
Staff responsibilities and attitudes		
The providers are motivated to provide high-quality services	<input type="checkbox"/>	<input type="checkbox"/>
The providers are supportive, respectful, and helpful during their interactions with clients	<input type="checkbox"/>	<input type="checkbox"/>
The providers are able to get all their work done within their allotted work hours	<input type="checkbox"/>	<input type="checkbox"/>
The providers know all of the tasks required of them	<input type="checkbox"/>	<input type="checkbox"/>
The providers all have job descriptions	<input type="checkbox"/>	<input type="checkbox"/>
All staff members are properly supervised	<input type="checkbox"/>	<input type="checkbox"/>
Contraceptive supplies		
Shortages and stockouts of contraceptives are rare	<input type="checkbox"/>	<input type="checkbox"/>
Clients never discontinue contraceptive use because of supply shortages	<input type="checkbox"/>	<input type="checkbox"/>
The same brands and doses are always available (there may be additions but not substitutions)	<input type="checkbox"/>	<input type="checkbox"/>
What do you do if you cannot provide the client with the method she or he wants? _____		
What percentage of your clients discontinue using any method at all? _____		
Possible future changes in demand for contraceptives are taken into consideration when estimates of future need are made	<input type="checkbox"/>	<input type="checkbox"/>
The contraceptives are stored under good conditions	<input type="checkbox"/>	<input type="checkbox"/>
Periodic visual inspections are conducted of the contraceptives to check for signs of damage or deterioration and for expiration dates	<input type="checkbox"/>	<input type="checkbox"/>
Complaints about the quality of the contraceptives are documented	<input type="checkbox"/>	<input type="checkbox"/>
Client information		
Adequate information is kept on all of the clients	<input type="checkbox"/>	<input type="checkbox"/>
Client files are easy to find and use	<input type="checkbox"/>	<input type="checkbox"/>
Clients are followed up if they do not return when their method has run out or they have missed an appointment	<input type="checkbox"/>	<input type="checkbox"/>

Table 27:1 Evaluating quality of services: Guidelines and practices (Continued)

	Yes	No
Access to services		
The clinic is open at hours convenient to the clients	<input type="checkbox"/>	<input type="checkbox"/>
The clinic is easy for the clients to get to	<input type="checkbox"/>	<input type="checkbox"/>
The clients are not discouraged by the clinic's location	<input type="checkbox"/>	<input type="checkbox"/>
The clinic facilities are clean and pleasant	<input type="checkbox"/>	<input type="checkbox"/>
Appointments are taken in order	<input type="checkbox"/>	<input type="checkbox"/>
The water supply is adequate	<input type="checkbox"/>	<input type="checkbox"/>
The program makes home visits	<input type="checkbox"/>	<input type="checkbox"/>
Client Feedback		
There are mechanisms for getting feedback and suggestions from the clients regarding the quality of services	<input type="checkbox"/>	<input type="checkbox"/>
The client's perspective is a consideration when changes are made in the clinic's services or policies	<input type="checkbox"/>	<input type="checkbox"/>
Evaluating Quality of Services: The Client's Perspective [These questions to be answered by the clients]		
It was easy to find out where to get family planning services	<input type="checkbox"/>	<input type="checkbox"/>
The family planning facility was easy to find	<input type="checkbox"/>	<input type="checkbox"/>
I came to this site because: _____		
The clinic's hours of operation are convenient for me If No, a convenient time for me is: _____	<input type="checkbox"/>	<input type="checkbox"/>
The family planning provider was easy to talk with	<input type="checkbox"/>	<input type="checkbox"/>
The provider answered all questions and encouraged questions	<input type="checkbox"/>	<input type="checkbox"/>
I was able to get all the information I needed to make a decision about what method to use	<input type="checkbox"/>	<input type="checkbox"/>
I was treated with respect by the people at the clinic	<input type="checkbox"/>	<input type="checkbox"/>
I did not feel rushed and I felt that the provider had enough time to address my concerns	<input type="checkbox"/>	<input type="checkbox"/>
The facilities are pleasant	<input type="checkbox"/>	<input type="checkbox"/>
There was enough seating in the waiting area	<input type="checkbox"/>	<input type="checkbox"/>
The wait was not too long	<input type="checkbox"/>	<input type="checkbox"/>
I was treated courteously at all times	<input type="checkbox"/>	<input type="checkbox"/>

Table 27:1 Evaluating quality of services: Guidelines and practices (Continued)

	Yes	No
Evaluating Quality of Services: The Client's Perspective (Continued)		
The providers seemed to be knowledgeable about what they were doing	<input type="checkbox"/>	<input type="checkbox"/>
The providers answered my questions satisfactorily	<input type="checkbox"/>	<input type="checkbox"/>
I had enough privacy during the counseling	<input type="checkbox"/>	<input type="checkbox"/>
I had enough privacy during the exam	<input type="checkbox"/>	<input type="checkbox"/>
I was able to get the contraceptive method I wanted	<input type="checkbox"/>	<input type="checkbox"/>
If Not, I was satisfied with the reason I could not get it	<input type="checkbox"/>	<input type="checkbox"/>
I was given an alternate method	<input type="checkbox"/>	<input type="checkbox"/>
The contraceptive method I want is affordable	<input type="checkbox"/>	<input type="checkbox"/>
I would be comfortable returning to this facility	<input type="checkbox"/>	<input type="checkbox"/>
I would be comfortable returning to the providers	<input type="checkbox"/>	<input type="checkbox"/>
I would recommend this facility to others	<input type="checkbox"/>	<input type="checkbox"/>
The other services I would like to see offered at this site are:		

Other comments I have:		

Source: Katz et al. (1993)

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Future Technologies

In the family planning training course, nearly every student said, "There should be more alternatives that are more effective for a longer period of time and with fewer side effects. When can we offer new contraceptives to our clients?"

Researchers are investigating new contraceptive methods that may appear in the next decade. This chapter briefly presents some of the methods currently under development.

Hormonal methods, such as pills, implants, and injections, are popular among African women. Researchers are working to develop improved versions of these methods. Mothers need hormonal methods they can take safely while breastfeeding. The prime candidates are the natural hormone progesterone and a synthetic with the code name ST-1435.⁶ It is too early to say whether any of these methods will be available by the next decade.

The widespread threat of acquired immunodeficiency syndrome (AIDS) and other sexually transmitted infections (STIs) created a need to find contraceptive methods that women could use on their own to protect themselves. Barrier methods have long been used by women to avoid both pregnancy and disease. Researchers are working to improve the contraceptive effectiveness of these barriers and reduce their annoying side effects. Chemical barriers are also under study as another method to reduce the risk of STIs.

The last two to three decades of research notwithstanding, a vaccine to prevent pregnancy is not likely to be available for some time. The most advanced testing has been conducted with vaccines acting on human chorionic gonadotropin (hCG).¹ Because these vaccines are abortifacients, it is unlikely that any company will pursue their development vigorously. Other antigens that prevent fertilization, including a variety of sperm and zona pellucida antigens, are more promising politically but are so early in development that none will be available in the next decade.

HORMONAL METHODS

IMPLANTS

Implanon Implanon is a single implant effective for 2 to 3 years. The implant is currently undergoing large-scale clinical trials worldwide and should appear on the market in a few years.²

Norplant II Norplant II is an improved version of Norplant that contains two rods instead of six. It may be on the market soon.⁵

Biodegradable implants Biodegradable implants dissolve in the body and do not need to be removed. Pellets the size of grains of rice would be effective for 2 years.⁹ Another new implant is made from tubes, as is Norplant; these tubes degrade after 2 years.⁴

INJECTABLES

Levonorgestrel butanoate An alternative to depot medroxyprogesterone acetate (Depo-Provera), it could be available in the late 1990s.

Estrogen-containing injectables The World Health Organization has tested a number of monthly injectables that contain an estrogen as well as a progestin to minimize bleeding disruptions caused by progestin-only methods.

Vaginal rings	Vaginal rings, when placed deep in the vagina, provide another method of continuously delivered progestins. Researchers are developing devices that are less irritating to the vagina and that have both estrogen and progestin.
Natural progesterone	Natural progesterone is being tested in vaginal rings, suppositories, and injectable polymeric microspheres. The rings stand the best chance of being approved for routine clinical use.
ST-1435	ST-1435 is being tested in skin creams, transdermal devices, vaginal rings, and subdermal implants.

MECHANICAL BARRIER METHODS

Female condom	Available in Europe and the United States. Because of its design, the female condom protects all of the vaginal lining, thus providing good protection against pathogens.
Lea's shield	A one-size-fits-all diaphragm-like device. A one-way valve allows uterine and cervical fluids to escape yet prevents sperm from getting into the cervix. This device should be approved by 2000.
Femcap	This cervical cap comes in three sizes; the size selection is made based on the user's parity. ⁸ Femcap should be approved by the end of the decade.
Silicone diaphragm	An easy-to-fit silicone diaphragm might well be more comfortable and easier for women to use than conventional diaphragms.

INTRAUTERINE DEVICES

- Frameless IUD** The frameless copper IUD does not press against the uterus and thus reduces cramping.¹⁰ A thread secures the sleeves at the fundus.
- Levonorgestrel IUD** This IUD provides 7 years of protection.⁷ It reduces excessive bleeding and may protect against pelvic inflammatory disease by thickening the cervical mucus. This IUD is available in some countries but not in others.

METHODS FOR MEN

- Vaccines** A vaccine using luteinizing hormone-releasing factor (LHRF) linked to tetanus toxoid shuts down the testes; the user would need to take testosterone. A vaccine based on follicle stimulating hormone (FSH) tested in monkeys eliminates sperm while maintaining normal testosterone levels.
- Hormones** Testosterone enanthate (TE) reduces sperm production to levels that may be low enough to prevent pregnancy.¹¹ However, the current weekly injection schedule is impractical. Implants that can deliver testosterone for 2 to 3 months to a year are under study.²
- Plastic male condom** A search has long been under way to develop condoms with improved feel and durability. A new polyurethane condom with a traditional design may allow the user more sensitivity, perhaps making the device more acceptable to many men who dislike the currently available condoms.

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Glossary

A

Abortion The expulsion or extraction of the products of conception from the uterus before the embryo or fetus is capable of independent life. Abortions may be spontaneous or induced. Spontaneous abortions are commonly called miscarriages. Induced abortions are voluntary interruptions of pregnancy or therapeutic abortions. Incomplete abortion occurs when some products of conception, usually the placenta, remain inside the uterus. Missed abortion is when the fetus has died in utero and some or all of the nonliving products of conception remain in the uterus. See miscarriage.

Abscess A localized collection of pus.

Abstinence Refraining from sexual intercourse.

Acquired immunodeficiency syndrome (AIDS) A disease defined by a set of signs and symptoms, caused by the human immunodeficiency virus (HIV), transmitted through body fluids (e.g., semen, blood) and characterized by compromised immune response.

Adenopathy Any disease of the lymph nodes or glands, characterized by swelling.

Adhesion Abnormal sticking together of body tissues, usually by bands of scar tissue that form between two tissues following inflammation.

Adolescence The transition period between puberty and adulthood; the teenage period.

Adnexa The appendages and accessory organs of the uterus, including the ligaments, ovaries, fallopian tubes, and abdominal cavity.

AIDS See Acquired immunodeficiency syndrome.

Amenorrhea The absence or suppression of menstruation. This state is normal before puberty, after menopause, and during pregnancy and lactation.

Amniocentesis Removal of amniotic fluid from the uterus. This procedure may be done to determine fetal chromosomal and biochemical abnormalities, fetal maturity, or fetal sex.

Amnion The inner membrane that forms a fluid-filled sac surrounding and protecting the embryo or fetus. The amnion and the chorion together are called the fetal membranes or the bag of waters.

Ampulla The wide upper end of the vas deferens. Also refers to the widening of the fallopian tubes.

Androgen A natural steroid hormone found in males and females. It is responsible for producing masculine characteristics (e.g., deep voice, facial hair) by stimulating the sex organs of the male. Androgens are produced chiefly by the testes but also by the adrenal cortex and the ovaries.

Anemia A condition in which the quantity of red blood cells per unit volume of blood is below normal levels.

Angioedema A localized edema caused by dilation and increased permeability of the capillaries.

Anorgasmia Inability to have an orgasm. Also called preorgasmia.

Anovulation Temporary or permanent cessation of ovulation.

Anteverted Tipped or tilted forward, as an anteverted uterus.

Artificial insemination Introduction of semen into the uterus or oviduct by other than natural means.

Aspiration Removal of contents from a body cavity by suction.

Azoospermia Absence of sperm in semen.

B

Bacterial vaginosis (BV) Disease of the vagina caused by infection with certain bacteria.

Band-aid surgery A tubal ligation procedure done through an incision small enough to be covered with a band-aid.

Barrier method A contraceptive method that establishes a physical barrier between the sperm and ovum, e.g., condom, diaphragm, foam, cervical cap. Some of the barrier contraceptives are used in conjunction with a spermicidal agent.

Bartholin's glands Small glands found on either side of the vaginal entrance that secrete small amounts of lubricating fluid. Also called vestibular glands.

Basal body temperature method (BBT) A method of fertility regulation that uses daily temperature readings taken immediately after waking to identify the time of ovulation: approximately 24 hours after ovulation, the BBT increases. See periodic abstinence.

Billings method See periodic abstinence.

Bimanual examination Two-handed examination of the pelvic structures performed by inserting gloved finger(s) of one hand into the vagina and/or rectum, while pressing with the other hand on the lower abdominal wall.

Biopsy Removal of tissue from a living body for diagnostic purposes.

Biphasic Two different phases, as in biphasic basal body temperature. A rise in temperature in the second half of the cycle that indicates ovulation has probably occurred.

Birth rate (or crude birth rate) The number of live births per 1,000 of the mid-year population in a given year. Compare with growth rate and death rate.

Breakthrough bleeding Bleeding at a time in the cycle other than the menstrual period. See menorrhagia and metrorrhagia.

Bulbourethral glands See Cowper's glands.

C

Caesarean section (also Cesarean) Surgical delivery of a baby through an abdominal C-section.

Candida A genus of yeast-like fungi. Candida is part of the normal flora of the skin, mouth, intestinal tract, and vagina but may cause disease when it grows to outnumber the other normal flora. See moniliasis.

Cannula A hollow tube for insertion into a body cavity.

Capacitation The process by which sperm become capable of penetrating an egg, which occurs in the female reproductive tract.

Carcinoma A new cancerous growth originating in any of the epithelial tissues of the body and characterized by invasive growth and rapid spread to other parts of the body.

Castration Removal of the gonads (testes or ovaries).

Cautery Use of heat, electricity, or chemicals to destroy abnormal or excessive tissue.

Cervical cap Small latex or plastic cap that covers the cervix. Users of this barrier method of birth control must spread spermicidal cream or jelly inside the cap.

Cervical crypts Small indentations that line the length of the cervical canal and contain mucus; may serve as a reservoir for sperm.

Cervical intraepithelial neoplasia (CIN) A sexually transmitted disease exhibiting early cancerous or precancerous changes of cervical epithelial cells. See dysplasia.

Cervicitis Inflammation of the cervix most commonly due to infection, exposure to chemicals (e.g., spermicidal agents), foreign bodies (e.g., cervical caps, tampons), or partially expelled intrauterine devices.

Chancro The primary lesion of syphilis, which appears as a hard, painless sore or ulcer often on the penis or vaginal tissue.

Chancroid A sexually transmitted disease caused by the *Hemophilus ducreyi* bacterium and characterized by a soft sore on the genitals, which becomes painful and discharges pus.

Childbearing years The reproductive age span of women, assumed for statistical purposes to be 15 to 44 years in the United States. In other countries, the range is often set at 15 to 49 years.

Chlamydia trachomatis A microorganism that can cause vaginitis, urethritis, cervicitis, pelvic inflammatory disease, and lymphogranuloma venereum (LGV). Also called chlamydia, mucopurulent cervicitis, and nongonococcal urethritis (in men). Symptoms include cervical discharge (yellow or green), redness, ectopy, tendency to injury, and white blood cells on microscopic evaluation of cervical secretions.

Chloasma Splotchy, brownish skin discoloration associated with high estrogen levels. May affect oral contraceptive users. Also called mask of pregnancy.

Circumcision In males, surgical removal of the loose skin (foreskin) covering the end of the penis. Often performed shortly after birth. In females, surgical excision of part or all of the clitoris and/or labia minora.

Climacteric A prolonged period of time during which there is a decrease in estrogen production, characterized by a decrease in the frequency of ovulatory cycles and partial atrophy of secondary sexual characteristics. Within that time span, the woman stops menstruating; this event is called the menopause.

Climax See orgasm.

Clitoris A small, pea-sized, hooded, erectile body located on the vulva above the vagina. It is situated between the labia minora in front of the urethra. It is the anatomical equivalent of the penis in the male and is highly responsive to sexual stimulation.

Cohort A group of people experiencing an event (births, marriages, etc.) at the same time who are observed through time.

Coitus Entry or penetration of the penis into the vagina. Also called intercourse or copulation.

Coitus interruptus Removing the penis from the vagina just prior to ejaculation. Also called withdrawal or pulling out.

Colposcopy Technique of viewing the cervix and vaginal mucosa magnified 10 to 20 times normal size, making it possible to see structures invisible to the naked eye.

Colpotomy Incision through the lateral fornices or posterior fornix of the vagina into the cavity surrounding the uterus and adnexal structures.

Conception Generally the beginning of pregnancy. Conception is usually equated with the fertilization of the ovum by the sperm, but is sometimes equated with the implantation of the fertilized ovum in the uterine lining.

Condom A barrier method worn during intercourse as a method of contraception and as a prophylactic against sexually transmitted disease. *Male:* A cylindrical sheath of latex, plastic, or sheep intestine worn over the penis. *Female:* A closed-end tube of plastic placed inside the vagina.

Condyloma Wart-like skin growth that may appear on the internal and external sex organs or anus caused by the *Condylomata acuminata*, a sexually transmitted condition caused by the human papillomavirus. *Condyloma acuminata* infections may lead to cervical, vulvar, and penile cancer. Also called venereal warts, flat condylomata, HPV warts, and papillomavirus warts.

Congenital Existing at, or before, birth.

Contraceptive prevalence rate A measure of the extent of contraceptive practice among a defined population group at a point in time. The numerator and denominator generally come from household surveys with the numerator consisting of the number of defined women estimated to be practicing contraception, including male-oriented methods.

Contraindication A medical condition that renders a course of treatment (that might otherwise be recommended) inadvisable or unsafe.

Corpus luteum Hormone-producing cells that develop from the ovarian follicle once a ripened ovum has been expelled. It produces progesterone to prepare the endometrium for implantation. If conception does not occur, the corpus luteum degenerates, leaving visible scars called the *corpora albicans*. If pregnancy does occur, the corpus luteum persists and functions through the first half of pregnancy.

Cowper's glands Small glands at the base of the penis which secrete lubricating fluids into the urethra. Also called bulbourethral glands.

Crabs See pediculosis.

Cryosurgery An operation that employs extremely decreased temperatures, achieved through liquid nitrogen or carbon dioxide, to destroy diseased tissue such as precancerous abnormalities of the cervix or vaginal walls, or warts on the vaginal walls, vulva, or cervix.

Cul-de-sac The closed pouch located between the anterior surface of the rectum and the posterior surface of the uterus.

Culdocentesis Aspiration of fluid from the space behind the uterus by puncture of the posterior vaginal wall or cul-de-sac. Removal of tissue by scraping with a spoon-shaped instrument called a curette. Used to remove the endometrial lining of the uterus. Also called a D&C, dilation and curettage.

Cyst A walled sac containing gas, liquid, or semi-solid material.

Cystocele Bulging of the bladder into the vagina.

Cytology Study of cells.

Cytomegalovirus A virus related to the herpes virus, capable of producing a sexually transmitted infection which is usually asymptomatic but may result in nonspecific febrile illness, pneumonitis, hepatitis, or mononucleosis.

D

D&C Dilation and curettage; dilation of the cervix with use of a sound or laminaria, and scraping of the uterine lining. This procedure is often used during abortion.

D&E Dilation and evacuation; dilation of the cervix and evacuation of the uterine contents using vacuum techniques.

Death rate The number of deaths per 1,000 of the mid-year population in a given year. Compare with growth rate and birth rate.

Demographic transition The historical shift of birth and death rates from high to low levels in a population. The decline in mortality has historically preceded the decline in fertility, resulting in rapid population growth during the transition period.

Depo-Provera Injectable form of medroxyprogesterone acetate; see injectable contraceptives.

Diaphragm A soft, rubber, dome-shaped device worn over the cervix and used with spermicidal jelly or cream for contraception. Diaphragms are circular, shallow, rubber domes with a firm but flexible outer rim. They fit between the posterior vaginal wall (posterior fornix) and the recess behind the pubic arch.

Diathermy Heating of body tissues due to their resistance to the passage of high-frequency electromagnetic radiation, electric currents, or ultrasonic waves. In medical diathermy, tissues are warmed but not damaged; in surgical diathermy (electrocoagulation), tissues are destroyed.

Dilation (Dilatation) To stretch beyond normal dimensions, usually in the context of the cervix. The instruments most commonly used to dilate the cervical canal are called Hegar dilators. Laminaria are also used to dilate the cervix.

Distal A location farthest from a point of reference; opposite of proximal.

Douche Cleansing the vaginal canal with a liquid; not an effective means of STD prevention.

Ductus deferens See vas deferens.

Dysmenorrhea Painful menstruation. Usually cramping midline lower abdominal pain. May be associated with low back pain, nausea, diarrhea, or upper thigh pain.

Dyspareunia Difficult or painful sexual intercourse.

Dysplasia Abnormal development of cells or tissues. Dysplasia, as a Pap smear diagnosis, corresponds to Class III or cervical intraepithelial neoplasia (CIN).

Dysuria Painful or difficult urination.

E

Eclampsia Generalized seizure related to pregnancy occurring after the 24th week of gestation. Eclampsia is usually accompanied by high blood pressure, edema, and protein in the urine. See pre-eclampsia and toxemia.

Ectopic Out of place; an ectopic pregnancy occurs when the embryo implants outside the uterus, usually in the fallopian tube. Much less commonly, implantation may occur in the endocervical canal, on the ovary, or within the abdominal cavity.

Ectropion The turning outward of tissue margin, as may occur on the cervix. Cervical ectropion can precede cancerous changes but may also occur under other circumstances such as during use of oral contraceptives.

Edema Excessive fluid retention, swelling.

Egg An ovum; a female gamete; an oocyte; a female reproductive cell at any stage before fertilization.

Ejaculation Expulsion of semen from the penis. See orgasm.

Embryo The developing conceptus through the first seven to eight weeks of gestation, after which it is called a fetus. See fetus.

Emergency contraception Methods used to prevent pregnancy after unprotected intercourse; e.g., hormones, IUDs, and prostaglandin suppositories.

Emergency contraceptive pill A method of using higher doses of birth control pills following unprotected sexual intercourse. ECPs are a temporary method that would ideally lead to regular contraceptive use.

Endocrine glands Ductless glands that secrete hormones into the blood stream. See exocrine glands.

Endometriosis A condition in which endometrial glands are present outside the uterus in abnormal locations such as the tubes, ovaries, peritoneal cavity and bowel; produces abnormal vaginal bleeding and dysmenorrhea. It may also produce abdominal, pelvic, or rectal pain.

Endometritis Inflammation of the endometrium or uterine lining.

Endometrium The mucous inner lining of the uterus.

Enteric infections A group of sexually transmitted infections caused by the bacteria, viruses, protozoa, and organisms that produce intestinal disease.

Epididymis A coiled tubular structure where sperm cells mature and are nourished, and which connects the testes to the vas deferens.

Episiotomy An incision in the perineum to facilitate passage during childbirth while minimizing injury to the woman.

Erection Hardening of the clitoris or penis caused by a rush of blood during sexual excitement.

Estrogen The primary female hormones; any natural or artificial substance that induces estrogenic activity, more specifically, the hormones estradiol and estrone produced by the ovary. Estrogens are produced chiefly by the ovary but also by the adrenal cortex and the testis.

Exocrine glands Glands that secrete substances, such as tears or saliva, through ducts to surfaces and organs. See endocrine glands.

F

FDA Food and Drug Administration in the United States. This agency must approve drugs used in the United States; many other nations follow the dictates of the U.S. FDA.

Fecundity The physiological capacity of a woman, man, or couple to produce a live child. See fertility.

Fertility The actual output of births, as opposed to the potential output.

Fertility awareness A method of birth control in which a couple charts cyclic signs of the woman's fertility and ovulation, using basal body

temperature, mucus changes, and other signs to determine fertile periods. See periodic abstinence.

Fetus The developing conceptus after 7 to 8 weeks postfertilization (the end of the embryonic period) until birth. See embryo.

Fibroadenoma Benign breast tumor(s).

Fibrocystic breast disease Benign breast tumor(s) involving multiple cysts in the terminal ducts and acini of the breast. Also known as cystic mastitis, chronic cystic breast disease, cystic hyperplasia, and cystic adenosis.

Fibroids Tumors of the muscle and connective tissues of the uterus that usually remain benign. Also called myomas (or myomata) and leiomyomas (or leiomyomata).

Fibromyoma A tumor composed of both fibrous and muscular tissue.

First trimester The first 12 weeks of pregnancy.

Follicle A small secretory sac or cavity. One type of follicle is an ovarian follicle, which is a very small sac in the ovary in which an ovum matures and from which the egg is released.

Follicle stimulating hormone (FSH) Anterior pituitary hormone that stimulates the ovary to ripen egg follicles. FSH stimulates sperm production in the male testes.

Forceps Grasping instrument used to facilitate delivery or rotation of the baby's head; other forceps are used to grasp other tissues, cotton balls, intrauterine devices, etc.

Foreskin A retractable fold of skin over the head of the penis. It is removed during circumcision.

FSH See Follicle stimulating hormone.

Fundus The part of a hollow organ farthest from its opening. The fundus of the uterus is farthest from the cervix.

Fungal infection See moniliasis.

G

Gardnerella See Bacterial vaginosis.

General fertility rate Live births per 1,000 women aged 15 to 44 years in a given year.

Gonad An organ that produces sex cells (e.g., the testis and ovary).

Gonadotropin A substance having an affinity for, or a stimulating effect on, the gonads. There are three varieties: anterior pituitary, chorionic (from pregnant women's urine), and equine (from the serum of pregnant horses).

Gonadotropin releasing hormone (GnRH) A hormone released from the hypothalamus that signals the pituitary gland to release the gonadotropin's luteinizing hormone (LH) and follicle stimulating hormone (FSH).

Gonorrhea A common sexually transmitted infection characterized by a pus-like discharge from urethra or cervix and caused by the bacterium *Neisseria gonorrhoeae*, a gram negative diplococcus. This infection is also called GC, clap, the drip, and gonococcus.

Granuloma A growth or chronically inflamed area; usually firm, nodular, and containing macrophages.

Granuloma inguinale A sexually transmitted infection that is characterized by single or multiple subcutaneous nodules that erode to form ulcers, caused by the bacterium *Calymmatobacterium granulomatis* (formerly called *Donovania granulomatis*).

Gravid Pregnant.

Gravidity The number of pregnancies.

H

Hematocrit The volume percentage of red blood cells in whole blood.

Herpes A group of contagious viral diseases that can cause sores on the mouth or the genitals. The ulcerous sores on the genitals can increase the risk of HIV transmission.

Human chorionic gonadotropin (HCG) A glycoproteinaceous hormone produced by the placenta, which maintains the corpus luteum and causes it to secrete estrogen and progesterone. Measured in urine and blood to detect pregnancy.

Human immunodeficiency virus (HIV) The virus that causes AIDS. It causes a defect in the body's immune system by invading and then multiplying within white blood cells.

Human papillomavirus (HPV) A genus of viruses that includes those causing papillomas (small nipple-like protrusions of the skin or mucous membrane) and warts in humans.

Hydrocele Swelling of the scrotum due to fluid build-up in the sac of the membrane covering the testicle.

Hymen A membrane that partially covers the entrance to the vagina. Through history, an intact hymen has been equated with virginity; however, hymens may tear for a number of reasons other than intercourse.

Hypophysis The pituitary gland.

Hypothalamus Part of the brain just above the pituitary, which helps to regulate basic functions such as sleep, appetite, body temperature, and fertility. The hypothalamus is influenced by levels of the brain and controls hormone production by the pituitary.

Hysterectomy Surgical removal of the uterus.

Hysteroqram An X-ray of the uterus or record of the strength of uterine contractions.

I

Implantation The process whereby an ovum six or seven days after fertilization burrows into the lining of the uterus and attaches itself firmly. Successful implantation is essential to the development of the embryo.

Impotence Inability to have or sustain an erection.

Infant mortality rate The number of deaths among infants under 1 year of age in a given year per 1,000 live births in that year.

Infertility Failure, voluntary or involuntary, to produce offspring. Primary infertility: The woman has never conceived despite cohabitation, exposure to the possibility of pregnancy, and the wish to become pregnant for at least 12 months (World Health Organization definition). Secondary infertility: The woman has previously conceived but is subsequently unable to conceive despite cohabitation, exposure to the possibility of pregnancy, and the wish to become pregnant for at least 12 months (WHO).

Informed consent Explanation to a patient of a diagnostic or therapeutic approach so that the patient may make a rational decision about it. Components of informed consent include explanation of the benefits, risks, and alternatives of an approach; the opportunity of the patient to ask questions and decide whether to proceed with the approach; detailed instructions; and documentation that those steps have been carried out.

Injectable contraceptives Hormonal contraceptives given by injection. Two examples of injectable progestins are Depo-Provera (DMPA or medroxyprogesterone acetate) and norethindrone enanthate.

In situ Confined to place of origin with no spread to other tissues, e.g., carcinoma in situ.

Intrauterine device (IUD) A flexible, usually plastic device inserted into the uterus to prevent pregnancy. May contain metal (generally copper) or hormones for added effectiveness. It produces a local sterile inflammatory response caused by the presence of a foreign body in the uterus, which causes lysis of the blastocyst and sperm, and/or the prevention of implantation. IUDs may also prevent fertilization due to damaging effects on spermatozoa as they pass through the uterus.

Introitus The opening of the vagina to the outside.

In vitro Outside the living organism and in an artificial environment.

In vitro fertilization A procedure in which an egg is removed from a ripe follicle and fertilized by a sperm cell outside the human body. The fertilized egg is allowed to divide for about two days and then is inserted back into the uterus of the woman.

Involution The return of the uterus to a normal, nonpregnant size after parturition.

IUD See Intrauterine device.

L

Labia A lip or lip-like structure. The labia majora are folds of skin on either side of the entrance to the vagina and are covered with hair in most adult women. The labia minora are the smaller hairless folds of tissue just within the labia majora.

Lactation The secretion of milk. The ideal means for most women to feed their newborn infant. Breast milk transfers immunoglobulins, albumin, vitamin B12 binding globulin, lactobacilli, lactoferin, macrophages, neutrophils, complement, lactoglobulin, and certain medications and drugs from mother to infant. Lactation can produce anovulation.

Laminaria A plug of sterile dried kelp (seaweed), which expands when wet. It is often used to dilate the cervix.

Laparoscopy Surgical inspection of the abdominal cavity and pelvic structures through a narrow lighted tube.

Laparotomy A surgical incision into the abdomen.

LH See Luteinizing hormone.

Libido Sexual drive. See orgasm.

Lice See pediculosis pubis.

Life expectancy The average number of additional years a person would live if current mortality trends were to continue. Most commonly cited as life expectancy at birth.

LMP Last menstrual period. Often used to calculate length of pregnancy.

LRF analogs Numerous synthetic chemical substances similar to naturally produced luteinizing hormone releasing factor (LRF), a hypothalamus-controlled secretion from the anterior pituitary gland. They are under study as contraceptives and agents to treat infertility. See GnRH.

Luteinizing hormone (LH) Anterior pituitary hormone that causes a follicle to release a ripened ovum and become a corpus luteum. In the male it stimulates testosterone production and the production of sperm cells.

M

Mammary glands Glands from which milk comes during breastfeeding.

Mammography X-rays of the breast to detect abnormal tissue.

Marital fertility rate Number of live births per 1,000 married women aged 15 to 44 years in a given year (usually reported as rates within specific age groups).

Mask of pregnancy See Chloasma.

Mastalgia Breast discomfort or pain; there may be accompanying breast fullness or enlargement.

Mastectomy Surgical removal of the breast; simple mastectomy removes only breast tissue while radical mastectomy includes removal of lymph nodes and chest muscles.

Masturbation Stimulating one's own sex organs for pleasure.

Maternal mortality ratio The number of deaths to women due to pregnancy or childbirth complications per 100,000 live births in a given year.

Menarche The beginning of menstruation; i.e., the first menstrual period. This occurs during puberty but may not signify the beginning of full adult fecundity because ovulation may be irregular or absent for some time. Early cycles tend to be anovulatory; however, there are reports of pregnancy prior to menarche.

Menorrhagia Increased amount of menstrual flow, but not greater than 7 days in duration. See metrorrhagia.

Menopause Cessation of menstruation. After menopause, a woman is permanently sterile. Surgical menopause refers to the removal of a woman's ovaries before natural menopause occurs.

Menses Menstrual flow.

Metrorrhagia 1. Increased duration of menstrual flow beyond 7 days, or bleeding between periods. See menorrhagia. 2. Postpartum uterine hemorrhage due to insufficient contraction of the uterine muscles.

Minilaparotomy Female sterilization procedure in which the fallopian tubes are ligated or cauterized through a small abdominal incision.

Minipill An oral contraceptive containing no estrogen and generally less than 1 mg of a progestational agent per pill.

Miscarriage Spontaneous abortion before the fetus is viable. See abortion.

Mites See scabies.

Mittelschmerz Lower abdominal pain associated with ovulation; this pain occurs in the middle of the cycle. The LH peak-induced rise in prostaglandins causes contractions of the fallopian tube, uterus, and/or gastrointestinal tract. The pain of mittelschmerz may also be due to a chemical peritoneal irritation caused by bleeding from the ovulation site or pressure from the expanding follicle.

Moniliasis Infection caused by yeast-like organisms, usually in the vagina and the vulva or under folds of skin in other areas. Usually, the organism is *Candida albicans*. Also called candidiasis, monilia, *Candida albicans*, fungus infection, and yeast. Yeast infection causes a thick, white discharge; itching, redness, or swelling around the labia; and sometimes itching and redness on the upper thighs. Some women have no symptoms at all. Men may be symptom-free or may develop urethritis, sores on the penis, or inflammation of the tip of the penis.

Monophasic A one-level basal body temperature (BBT) curve demonstrating no rise in temperature during the menstrual cycle. Suggests anovulation.

Morning-after birth control See Emergency contraceptive pill.

Morning-after pill A hormonal drug that temporarily disrupts the uterine environment to prevent implantation of the fertilized egg if taken within 72 hours after unprotected intercourse. Morning-after pills may also prevent ovulation.

Morning sickness Nausea of pregnancy.

Mucus method A method of birth control in which a couple charts the cyclic changes in cervical mucus patterns and abstains from intercourse during fertile days. Also called ovulation method or Billings method. See Periodic abstinence.

Multipara A woman who has had two or more pregnancies resulting in viable fetuses.

Mycoplasma Mycoplasma are the smallest free-living organisms, somewhere between viruses and bacteria in size. In adults most illnesses caused by mycoplasma are thought to be sexually transmitted. The two genital mycoplasmas found in the reproductive tract of all sexually active men and women, *Mycoplasma hominis* and *Ureaplasma urealyticum*, are poorly understood at present. In women, mycoplasma have been associated with vaginitis, PID, fever following abortion, fever following delivery, spontaneous abortion, low birth-weight infants, infertility, pyelonephritis, and ectopic pregnancy.

Mycoses Infections caused by fungi.

Myometrium The muscle layer of the uterus.

N

Neonatal Pertaining to the first four weeks after birth. Early neonatal: pertaining to the first week after birth.

Node A small, circumscribed swelling or knot of cells.

Nongonococcal urethritis (NGU) Bacterial infection other than a gonorrheal infection, often associated with chlamydia, with manifesting symptoms of discharge, dysuria, and itching.

Nullipara A woman who has never delivered a live infant; also written Para 0.

O

Obstetrics That specialty of medicine caring for the management of pregnancy and its complications.

OC See Oral contraceptives.

Oligomenorrhea Infrequent menstrual flow, with intervals between menses longer than 37 days and shorter than 90 days. Also scanty menstrual flow and irregular intervals are common.

Oocyte The ovum or egg cell in the female.

Oophorectomy Surgical removal of one or both ovaries.

Oral contraceptives (OC) Various progestin/estrogen or progestin compounds in tablet form taken sequentially by mouth; the pill. Estrogenic and progestational agents have contraceptive effects by influencing normal patterns of ovulation, sperm or ovum transport, cervical mucus, implantation, or placental attachment.

Orgasm A series of muscular contractions in the genital and pelvic areas that occurs at the peak of sexual excitement, resulting in a release of sexual tension. Also called climax.

Osteoporosis An abnormal softening, porousness, or reduction in the quantity of bone, resulting in structural fragility. Causes appear to include estrogen deficiency, thyroid imbalance, calcium deficiency, prolonged immobilization, and adrenal hyperfunction, which result in more bone resorption than formation.

Ovaries The female gonads; glands where ova are formed; also the primary source of the female hormones estrogen and progesterone.

Ovulation The release of an ovum from the ovarian follicle in the ovary during the female menstrual cycle. See periodic abstinence methods, mucus method.

Ovum The egg cell.

Oxytocin A hormone produced by the pituitary gland. As the baby suckles, impulses are sent to the posterior pituitary. The hormone oxytocin is released causing the milk let-down reflex. Oxytocin also causes the uterine muscles to contract.

P

Palpation Feeling with the hands to determine information about the condition of the body.

Panhisterectomy The surgical removal of the uterus, ovaries, and fallopian tubes.

Papnicolaou smear (Pap smear) A screening test for cervical cancer in which cells scraped from the surface of the cervix are placed onto a slide. The Pap test may also detect cancer of the uterus, ovary, or vagina; infections; or the level of estrogenic stimulation of the cervix.

Papillomavirus warts See condyloma.

Parity The number of live births a woman has had; a woman of zero parity has had no live births, a woman of parity one has had one live birth, etc.

Parturition The act of giving birth.

Pearl index The number of pregnancies per 100 woman-years exposure, usually used as a measure of contraceptive failure.

Pediculosis pubis Infestation of the pubic area with pubic lice. Pubic lice are parasites, small blood-sucking insects much like head lice. They are usually transmitted by sexual intimacy but may be spread by sharing clothing or a bed with an infected person. Also called crabs, papillons d'amour, and Phthirus pubis.

Pelvic inflammatory disease (PID) Inflammation of the pelvic structures, especially the uterus and tubes. The precipitating or contributing cause quite often is a sexually transmitted infection, such as gonorrhea, chlamydia, or both. Also called pelvic infection, polymicrobial pelvic infection, tubal infection, and salpingitis.

Perinatal The time period from the 28th week of pregnancy to 4 weeks after birth. May be defined as the time period from the 28th week of pregnancy to 1 week after birth.

Periodic abstinence methods Contraceptive methods that rely on timing of intercourse to avoid the ovulatory phase of a woman's menstrual cycle; also called fertility awareness or natural family planning.

1. The basal body temperature (BBT) method uses daily temperature readings to identify the time of ovulation.

2. In the ovulation or Billings method, women identify the relationships of changes in cervical mucus to fertile and infertile days.

3. The sympto-thermal method charts changes in temperature, cervical mucus and other symptoms of ovulation (i.e., intermenstrual pain).

Peritoneum The strong, smooth membrane that surrounds and contains the abdominal organs. Often is punctured in illegal procedures, resulting in infection and often death.

Pessary A device placed in the vagina or the uterus to support pelvic structures or prevent pregnancy. The diaphragm is a modern form of a pessary. Also a medicated vaginal suppository.

Pituitary gland A small gland located at the base of the brain beneath the hypothalamus; serves as one of the chief regulators of body functions, including fertility. Most endocrine glands in the body are controlled by the pituitary. Also known as the hypophysis.

Placenta The circular, flat, vascular structure within the pregnant uterus, which provides nourishment and eliminates wastes for the developing embryo and fetus and is passed as afterbirth after the baby is born.

PMS See Premenstrual syndrome.

Postpartum After childbirth.

PPNG Penicillinase-producing *Neisseria gonorrhoeae*; a penicillin-resistant strain of gonorrhea.

Preeclampsia See eclampsia and toxemia.

Pregnancy wastage Occurs when the woman is able to conceive but unable to produce a live birth. Pregnancy wastage occurs when pregnancy ends in miscarriage, stillbirth, or a nonsurviving premature infant.

Premature Occurring before the proper time. A premature infant is one born before 37 weeks of gestation, or sometimes arbitrarily defined as an infant weighing 1,000 to 2,499 grams (2.2 to 5.5 pounds) at birth. In some countries where adults are smaller than in the United States, the upper limit is 2,250 grams. Other criteria such as crown-heel length (less than 11.5 cm) have been used.

Premature ejaculation Ejaculation that occurs too rapidly relative to a standard set by a man or his partner.

Premenstrual syndrome (PMS) A set of physical and emotional experiences which may occur during the period prior to menses. Symptoms may include the following: breast fullness and tenderness, headache, weight gain, bloatedness, thirst, increased appetite, acne, lower back pain, cramping, lower abdominal pain, clumsiness, fear of losing control, violence, irritability, outbursts of crying, fatigue, depression, suicidal ideas, confusion, increased sexual desire, forgetfulness, mood swings, hyperactivity, and a craving for sweets, salt, and alcohol.

Prenatal Existing or occurring before birth.

Preterm An infant born at any time before 37 to 38 weeks of gestation.

Primagravida A woman who is pregnant for the first time.

Progesterone A steroid hormone produced by the corpus luteum, adrenals, or placenta. It is responsible for changes in the uterine endometrium in the second half of the menstrual cycle, which are preparatory for implantation of the fertilized ovum, development of maternal placenta after implantation, and development of mammary glands.

Progestins A large group of synthetic drugs that have a progesterone-like effect on the uterus.

Prolactin A hormone produced by the anterior lobe of the pituitary gland that stimulates milk secretion. As a baby sucks the breast, impulses are sent from the areola of the nipple to the vagus nerve and then to the anterior pituitary. The anterior pituitary secretes the hormone prolactin, which stimulates glands in the breast to produce milk. The anterior pituitary and prolactin are thought to be important in the long-term maintenance of milk secretion.

Prostaglandin Prostaglandins are produced as the endometrial lining degenerates and may cause mild to severe menstrual cramps, diarrhea, nausea, and vomiting. Oral contraceptives diminish the prostaglandins released by the endometrial lining, decreasing menstrual cramps in users.

Prostaglandin inhibitors Drugs that inhibit or suppress the action of prostaglandin. These drugs are helpful for dysmenorrhea.

Prostate A male organ, surrounding the neck of the bladder and urethra, that contributes acids and enzymes to the seminal fluid.

Proximal A location that is near to a point of reference; opposite of distal.

Pruritus Itching.

Pseudotumor cerebri A condition caused by cerebral edema in which increased intracranial pressure causes headaches, nausea, vomiting, and papilledema without other neurological signs.

Puberty The age when sex organs become functionally operative and secondary sex characteristics develop. For a girl, puberty means producing an ovum, and for a boy it is manufacturing spermatozoa. Secondary sexual characteristics in girls are breast development, enlargement of the hips, and development of axillary and pubic hair. In boys

they include appearance of pubic, facial, and axillary hair; growth of the penis, testicles and scrotum; and deepening of the voice.

Pubic lice See Pediculosis pubis.

Puerperium The six weeks after childbirth. Also called postpartum period.

Purulent Containing or producing pus.

R

Retroversion Bent backward on its vertical axis, i.e., retroverted uterus; also called tipped uterus. This is a normal variant occurring in approximately one-fifth of women.

Rhythm See Periodic abstinence.

Rubber See condom.

S

Salpingectomy Surgical removal of the fallopian tubes.

Salpingitis Inflammation of one or both fallopian tubes causing lower abdominal pain, tenderness, and cervical discharge. See pelvic inflammatory disease.

Scabies A contagious skin disease due to a mite that burrows beneath the skin causing intense itching. Also called mites and *Sarcoptes scabiei*.

Scrotum The external pouch containing testicles in men.

Semen The thick, whitish fluid, which normally contains sperm and seminal secretions and is ejected during ejaculation.

Seminal vesicles Two glandular structures located behind the prostate gland, which secrete a component of semen.

Seminiferous tubules Convoluted tubules in the testicles that produce sperm.

Sepsis (also Septicemia) The presence of various pathogenic bacteria or their toxins in the blood or tissues, resulting in chills and fever. See toxic shock syndrome.

Seroconversion When a person infected with HIV has detectable antibodies in his/her blood.

Sexually transmitted infection (STI) An infection that is communicated primarily or exclusively through intimate sexual contact. Sexually transmitted infections have been estimated to cause from 20% to 40% of infertility in the United States. STIs can adversely affect fertility by three primary mechanisms: pregnancy wastage, prenatal deaths, and damage to male or female reproductive capacity. Also called venereal disease or VD.

Sign Any objective evidence of a disease, as opposed to the subjective sensations (symptoms) perceived by the patient.

Sonogram Sound echo images of soft internal structures. Also called ultrasonography, can be used to determine size and position of the fetus, the placenta, a developing follicle, or a tumor.

Sounding Introducing an elongated probe called a sound into the uterine cavity to measure its dimensions.

Speculum An instrument for viewing the inside of the vagina and the cervix, or any other canal or cavity.

Sperm Male spermatozoa.

Spermatocele A swelling in the scrotum that occurs when the epididymis becomes cystic.

Spermatogenesis The formation of spermatozoa.

Spermicide A chemical substance that kills sperm, particularly foam, creams, jellies, and suppositories used for contraception. The spermicides used in almost all currently marketed spermicides are surfactants, surface-active compounds that destroy sperm cell membranes.

Spinnbarkeit A test to determine cervical mucus viscosity. A thread of cervical mucus is stretched between two glass slides (or two fingers) and its length is measured. The time at which it can be drawn to maximum length (lowest viscosity) usually precedes or coincides with the time of ovulation.

Spotting A small amount of bleeding at a time in the cycle other than menses; light irregular flow, often prolonged. Also called metrorrhagia.

Stable population A closed (no migration) population with an unchanging age distribution caused by unchanging age-specific fertility and mortality rates, and consequently an unchanging rate of growth.

Stationary population A stable population with a rate of growth of 0%.

STD See sexually transmitted infection.

Sterilization (tubal ligation, vasectomy) A surgical procedure that leaves the male or female incapable of reproduction. Sterilization is the most commonly employed method of birth control in the world.

Steroidogenesis The natural production of steroids. The usual progression of hormones is from progesterone and other progestins to androgens to estrogens.

Stricture Tightening or narrowing of a duct or hollow organ.

Subcutaneous Beneath the skin.

Suppository A medicine placed in a body orifice to dissolve and sometimes to be absorbed. Birth control suppositories contain spermicidal chemicals. They dissolve inside the vagina leaving spermicide to kill sperm.

Surgical menopause Removal of a woman's ovaries before natural menopause occurs.

Symptom Subjective evidence of disease or the condition of the patient. See sign.

Symptothermal method See periodic abstinence methods.

Syndrome A set of symptoms, which together characterize a condition or disease.

Syphilis A sexually transmitted infection caused by *Treponema pallidum*, a spirochete with 6-14 regular spirals and characteristic motility. The primary stage is characterized by a painless chancre. The secondary stage is characterized by rash, mucus patches, and condylomata lata. The latent stage has no characteristic sign but sequelae include tabes dorsalis, general paresis, thoracic aortic aneurism, aortic insufficiency, and localized gumma formation.

T

Telangiectasia A permanent dilation of blood vessels that create small red lesions in the skin or mucous membranes.

Teratogenic Tending to produce anomalies in formation, as in physical defects of the fetus in utero.

Testosterone Male sex hormone produced in the testes.

Term An infant born any time from the beginning of the 38th week (260 days) to the end of the 41st week (287 days) of gestating hormone.

Thyroid stimulating hormone (TSH) Anterior pituitary hormone that stimulates the thyroid gland.

Thyroid function tests Tests done to assess the function of the thyroid. Modern assessment of thyroid function is relatively easy utilizing radioimmunoassay of free T4 (thyroxin), TSH (thyroid stimulating hormone), and T3 (triiodothyronine).

Tipped uterus See retroversion.

Total fertility rate (TFR) The average number of children that would be born alive to a woman (or group of women) during her lifetime if she were to pass through her childbearing years conforming to the age-specific fertility rates of a given year.

Toxemia A term applied to hypertension, albuminuria, and edema when found in pregnancy. The condition usually develops after the 20th week of gestation or early in the presence of trophoblastic disease. It can lead to convulsions. Also known as preeclampsia.

Toxic shock syndrome (TSS) A severe illness characterized by a sudden high fever, vomiting, diarrhea, aches, and a sunburn-like rash. The disease usually occurs in menstruating women using tampons; thought to be caused by a vaginal infection with *Staphylococcus aureus*. See sepsis.

Trichomoniasis Infestation of the vagina with microscopic protozoan organisms called trichomonads resulting in irritation, itching, redness, an objectionable odor, pain, frequency of urination, and/or a yellow-green or a whitish-gray, foul-smelling, watery or frothy discharge.

TSS See Toxic shock syndrome.

Tubal infection See pelvic inflammatory disease.

Tubal ligation A surgical procedure in which the fallopian tubes are cut, tied, or burned to prevent the passage of ova. It does not interfere with menstruation or sexual capability but should be regarded as a permanent form of sterilization. Also called TL and sterilization.

Tubal patency Unobstructed fallopian tubes.

Tubal reanastomosis A surgical procedure in which the cut ends of the fallopian tube are brought together.

U

Ultrasonography See sonogram.

Ureter Tube that transports urine from the kidneys to the bladder.

Urethra The tube that drains urine from the bladder to the outside of the body. In women, the opening of the urethra is between the clitoris and the vagina. In men, the urethra travels the length of the penis transporting both urine and semen.

Urinary tract infection (UTI) Infections of the urethra, bladder, ureters, kidney; often associated with trauma from diaphragm use, other barrier methods, and frequent intercourse. Symptoms include lower back pain and painful urination.

Uterus The hollow, pear-shaped, muscular, elastic reproductive organ where the fetus develops during pregnancy.

V

Vacuum aspiration Removal of tissue by the creation of negative pressure through the removal of air.

Vagina The 3- to 5-inch long muscular tube leading from the external genitals of the female to the uterus. The external opening called the introitus, may be diminished by a membrane called the hymen. Sometimes called the birth canal, the vagina is the passageway through which babies are born and menstrual fluid flows. The vagina widens and lengthens during sexual arousal.

Vaginal hysterectomy Surgical removal of the uterus through the vagina.

Vaginismus Painful, spastic, usually involuntary contraction leading to constriction of the female pelvic muscles, which can occur during intercourse or during a pelvic examination. It tends to occur when a woman senses that something is about to penetrate the opening of the vagina.

Vaginitis Inflammation of the vagina. Often caused by a change in the vaginal environment by factors such as foreign bodies (tampons, cervical caps), trauma, broad spectrum antibiotics, extensive douching, IUD expulsion, certain systemic diseases, obesity, excessive moisture, tight clothing and a number of infectious agents.

Vaginosis See bacterial vaginosis.

Varicocele Dilated varicose veins in the spermatic cord. This condition usually presents as a baggy swelling of the scrotum. It may be a cause of infertility.

Vas deferens The tube through which sperm pass from the epididymis to the ejaculatory duct and then into the urethra. It is this tube that is cut in the male sterilization procedure called a vasectomy. Also called ductus deferens.

Vasectomy A surgical procedure in which segments of the vas deferens are removed and the ends tied to prevent passage of sperm. Vasectomy should be regarded as a permanent form of sterilization although reversal is possible.

Venereal disease (VD) See sexually transmitted infection.

Venereal warts See condyloma.

Vulvovaginitis Inflammation of both vulva and vagina.

W

Wassermann test The original blood test for syphilis. Since the Wassermann test is not syphilis specific (other diseases can cause a positive test), newer tests for syphilis (specific for the agent *T. pallidum*) such as VDRL, FTA, and RPA, have been developed.

Withdrawal See coitus interruptus.

Withdrawal bleeding Menstrual bleeding that occurs when the level of hormonal support to the endometrial lining decreases.

Y

Yeast See *Candida* and moniliasis.

Z

Zero growth A population neither growing nor shrinking.

Zygote The fertilized egg before it starts to divide.

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