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Incorporating HIV Prevention into the Medical Care of Persons Living with HIV

**Recommendations of CDC, the Health Resources and Services
Administration, the National Institutes of Health, and the HIV
Medicine Association of the Infectious Diseases Society of America**

INSIDE: Continuing Education Examination

**DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION**

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Incorporating HIV Prevention into the Medical Care of Persons Living with HIV

Recommendations of CDC, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America

Summary

Reducing transmission of human immunodeficiency virus (HIV) in the United States requires new strategies, including emphasis on prevention of transmission by HIV-infected persons. Through ongoing attention to prevention, risky sexual and needle-sharing behaviors among persons with HIV infection can be reduced and transmission of HIV infection prevented. Medical care providers can substantially affect HIV transmission by screening their HIV-infected patients for risk behaviors; communicating prevention messages; discussing sexual and drug-use behavior; positively reinforcing changes to safer behavior; referring patients for services such as substance abuse treatment; facilitating partner notification, counseling, and testing; and identifying and treating other sexually transmitted diseases (STDs).

To help incorporate HIV prevention into the medical care of HIV-infected persons, CDC, the Health Resources and Services Administration, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America developed these recommendations. The recommendations are general and apply to incorporating HIV prevention into the medical care of all HIV-infected adolescents and adults, regardless of age, sex, or race/ethnicity. They are intended for all persons who provide medical care to HIV-infected persons (e.g., physicians, nurse practitioners, nurses, physician assistants); they might also be useful to those who deliver prevention messages (e.g., case managers, social workers, health educators).

The recommendations were developed by using an evidence-based approach. For each recommendation, the strength of the recommendation, the quality of available evidence supporting the recommendation, and the outcome for which the recommendation is rated are provided. The recommendations are categorized into three major components: screening for HIV transmission risk behaviors and STDs, providing brief behavioral risk-reduction interventions in the office setting and referring selected patients for additional prevention interventions and other related services, and facilitating notification and counseling of sex and needle-sharing partners of infected persons.

Introduction

Despite substantial advances in the treatment of human immunodeficiency virus (HIV) infection, the estimated number of annual new HIV infections in the United States has remained at 40,000 for over 10 years (1). HIV prevention in this country has largely focused on persons who are not HIV infected, to help them avoid becoming infected. However, further reduction of HIV transmission will require new strategies, including increased emphasis on preventing transmission

by HIV-infected persons (2,3). HIV-infected persons who are aware of their HIV infection tend to reduce behaviors that might transmit HIV to others (4–7). Nonetheless, recent reports suggest that such behavioral changes often are not maintained and that a substantial number of HIV-infected persons continue to engage in behaviors that place others at risk for HIV infection (8–13).

Reversion to risky sexual behavior might be as important in HIV transmission as failure to adopt safer sexual behavior immediately after receiving a diagnosis of HIV (14). Unprotected anal sex appears to be occurring more frequently in some urban centers, particularly among young men who have sex with men (MSM) (15). Bacterial and viral sexually transmitted diseases (STDs) in HIV-infected men and women receiving outpatient care have been increasingly noted (16,17), indicating ongoing risky behaviors and opportunities for HIV

The material in this report originated in the National Center for HIV, STD and TB Prevention, Harold W. Jaffe, M.D., Director; Division of HIV/AIDS Prevention — Surveillance and Epidemiology, Robert S. Janssen, Director; Division of HIV/AIDS Prevention — Intervention, Research, and Support, Robert S. Janssen, M.D., Acting Director.

transmission. Further, despite declining syphilis prevalence in the general U.S. population, sustained outbreaks of syphilis among MSM, many of whom are HIV infected, continue to occur in some areas; rates of gonorrhea and chlamydial infection have also risen for this population (18–21). Rising STD rates among MSM indicate increased potential for HIV transmission, both because these rates suggest ongoing risky behavior and because STDs have a synergistic effect on HIV infectivity and susceptibility (22). Studies suggest that optimism about the effectiveness of highly active antiretroviral therapy (HAART) for HIV may be contributing to relaxed attitudes toward safer sex practices and increased sexual risk-taking by some HIV-infected persons (12,23–27).

Injection drug use also continues to play a key role in the HIV epidemic; at least 28% of AIDS cases among adults and adolescents with known HIV risk category reported to CDC in 2000 were associated with injection drug use (28). In some large drug-using communities, HIV seroincidence and seroprevalence among injection drug users (IDUs) have declined in recent years (29,30). This decline has been attributed to several factors, including increased use of sterile injection equipment, declines in needle-sharing, shifts from injection to noninjection methods of using drugs, and cessation of drug use (31–33). However, injection-drug use among young adult heroin users has increased substantially in some areas (34,35), a reminder that, as with sexual behaviors, changes to less risky behaviors may be difficult to sustain.

Clinicians providing medical care to HIV-infected persons can play a key role in helping their patients reduce risk behaviors and maintain safer practices and can do so with a feasible level of effort, even in constrained practice settings. Clinicians can greatly affect patients' risks for transmission of HIV to others by performing a brief screening for HIV transmission risk behaviors; communicating prevention messages; discussing sexual and drug-use behavior; positively reinforcing changes to safer behavior; referring patients for such services as substance abuse treatment; facilitating partner notification, counseling, and testing; and identifying and treating other STDs

(36,37). These measures may also decrease patients' risks of acquiring other STDs and bloodborne infections (e.g., viral hepatitis). Managed care plans can play an important role in HIV prevention by incorporating these recommendations into their practice guidelines, educating their providers and enrollees, and providing condoms and educational materials. In the context of care, prevention services might be delivered in clinic or office environments or through referral to community-based programs. Some clinicians have expressed concern that reimbursement is often not provided for prevention services and note that improving reimbursement for such services might enhance the adoption and implementation of these guidelines.

This report provides general recommendations for incorporating HIV prevention into the medical care of all HIV-infected adolescents and adults, regardless of age, sex, or race/ethnicity. The recommendations are intended for all persons who provide medical care to HIV-infected persons (e.g., physicians, nurse practitioners, nurses, physician assistants). They may also be useful to those who deliver prevention messages (e.g., case managers, social workers, health educators). Special considerations may be needed for some subgroups (e.g., adolescents, for whom laws and regulations might exist governing providing of services to minors, the need to obtain parental consent, or duty to inform). However, it is beyond the scope of this report to address special considerations of subgroups. Furthermore, the recommendations focus on sexual and drug-injection behaviors, since these behaviors are responsible for nearly all HIV transmission in the United States. Separate guidelines have been published for preventing perinatal transmission (38–40).

These recommendations were developed by using an evidence-based approach (Table 1). The strength of each recommendation is indicated on a scale of A (strongest recommendation for) to E (recommendation against); the quality of available evidence supporting the recommendation is indicated on a scale of I (strongest evidence for) to III (weakest evidence for), and the outcome for which the recommendation is rated is provided. The recommendations are categorized into three

TABLE 1. Rating systems for strength of recommendations and quality of evidence supporting the recommendations

Rating	Strength of the Recommendation
A	Should always be offered. Both strong evidence for efficacy and substantial benefit support recommendation for use.
B	Should generally be offered. Moderate evidence for efficacy — or strong evidence for efficacy but only limited benefit — supports recommendation for use.
C	Optional. Evidence for efficacy is insufficient to support a recommendation for use.
D	Should generally not be offered. Moderate evidence for lack of efficacy or for adverse outcome supports a recommendation against use.
E	Should never be offered. Good evidence for lack of efficacy or for adverse outcome supports a recommendation against use.
Quality of Evidence Supporting the Recommendation	
I	Evidence from at least one properly randomized, controlled trial.
II	Evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytic studies (preferably from more than one center), or from multiple time-series studies. Or dramatic results from uncontrolled experiments.
III	Evidence from opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees.

major components: 1) screening for HIV transmission risk behaviors and STDs, 2) providing brief behavioral risk-reduction interventions in the office setting and referring selected patients for additional prevention interventions and other related services, and 3) facilitating notification and counseling of sex and needle-sharing partners of infected persons.

This report was developed by CDC, the Health Resources and Services Administration (HRSA), the National Institutes of Health (NIH), and the HIV Medicine Association (HIVMA) of the Infectious Diseases Society of America (IDSA). The recommendations will evolve as results from ongoing behavioral intervention trials become available.

Risk Screening

Risk screening is a brief assessment of behavioral and clinical factors associated with transmission of HIV and other STDs (Table 2). Risk screening can be used to identify patients who should receive more in-depth risk assessment and HIV risk-reduction counseling, other risk-reduction interventions, or referral for other services (e.g., substance abuse treatment). Risk screening identifies patients at greatest risk for transmitting HIV so that prevention and referral recommendations can be focused on these patients. Screening methods include probing for behaviors associated with transmission of HIV and other

STDs, eliciting patient reports of symptoms of other STDs, and laboratory testing for other STDs. Although each of these methods has limitations, a combination of methods should increase the sensitivity and effectiveness of screening. In conducting risk screening, clinicians should recognize that risk is not static. Patients' lives and circumstances change, and a patient's risk of transmitting HIV may change from one medical encounter to another. Also, clinicians should recognize that working with adolescents may require special approaches and should be aware of and adhere to all laws and regulations related to providing services to minors.

Screening for Behavioral Risk Factors

Clinicians frequently believe that patients are uncomfortable disclosing personal risks and hesitant to respond to questions about sensitive issues, such as sexual behaviors and illicit drug use. However, available evidence suggests that patients, when asked, will often disclose their risks (41,42) and that some patients have reported greater confidence in their clinician's ability to provide high-quality care if asked about sexual and STD history during the initial visits (43).

Screening for behavioral risk factors can be done with brief self-administered written questionnaires; computer-, audio-, and video-assisted questionnaires; structured face-to-face

TABLE 2. Recommendations for screening of human immunodeficiency virus (HIV)-infected persons for HIV transmission risk

Recommendation	Rating
HIV-infected patients should be screened for behaviors associated with HIV transmission by using a straightforward, nonjudgmental approach. This should be done at the initial visit and subsequent routine visits or periodically, as the clinician feels necessary, but at a minimum of yearly. Any indication of risky behavior should prompt a more thorough assessment of HIV transmission risks.	A-II (for identifying transmission risk)
At the initial and each subsequent routine visit, HIV-infected patients should be questioned about symptoms of STDs (e.g., urethral or vaginal discharge; dysuria; intermenstrual bleeding; genital or anal ulcers; anal pruritus, burning, or discharge; and, for women, lower abdominal pain with or without fever). Regardless of reported sexual behavior or other epidemiologic risk information, the presence of such signs or symptoms should always prompt diagnostic testing and, when appropriate, treatment.	A-I (for identifying and treating STDs)
At the initial visit	
<ul style="list-style-type: none"> All HIV-infected women and men should be screened for laboratory evidence of syphilis. Women should also be screened for trichomoniasis. Sexually active women aged ≤ 25 years and other women at increased risk, even if asymptomatic, should be screened for cervical chlamydial infection. 	A-II (for identifying STDs)
<ul style="list-style-type: none"> Consideration should be given to screening all HIV-infected men and women for gonorrhea and chlamydial infections. However, because of the cost of screening and the variability of prevalence of these infections, decisions about routine screening for these infections should be based on epidemiologic factors (including prevalence of infection in the community or the population being served), availability of tests, and cost. (Some HIV specialists also recommend type-specific serologic testing for herpes simplex virus type 2 for both men and women.) 	B-II (for identifying STDs)
Screening for STDs should be repeated periodically (i.e., at least annually) if the patient is sexually active or if earlier screening revealed STDs. Screening should be done more frequently (e.g., at 3–6-month intervals) for asymptomatic persons at higher risk (see Box 2).	B-III (for identifying STDs)
At the initial and each subsequent routine visit, HIV-infected women of childbearing age should be questioned to identify possible current pregnancy, interest in future pregnancy, or sexual activity without reliable contraception. They should be referred for appropriate counseling, reproductive health care, or prenatal care, as indicated. Women should be asked whether they suspect pregnancy or have missed their menses and, if so, should be tested for pregnancy.	A-I (for preventing perinatal HIV transmission)

interviews; and personalized discussions (41,44–53). Screening questions can be either open-ended or closed (directed) (Box 1). Use of open-ended questions avoids simple “yes” or “no” responses and encourages patients to discuss personal risks and the circumstances in which risks occur (15,44,54). Open-ended questions also help the clinician gather enough detail to understand potential transmission risks and make more meaningful recommendations. However, although well received by patients, the open-ended approach may initially be difficult for clinicians schooled in directed questioning, who tend to prefer directed screening questions. Directed questions are probably useful for identifying patients with problems that should be more thoroughly discussed. Among directed approaches, technical tools like computer-, audio-, and video-assisted interviews have been found to elicit more self-reported risk behaviors than did interviewer-administered questionnaires, particularly among younger patients (41,51–53,55). Studies suggest that clinicians who receive some training, particularly that including role-play and feedback concerning clinical performance, are more likely to perform effective risk screening (46–49).

Sex-related behaviors important to address in risk screening include whether the patient has been engaging in sex; number and sex of partners; partners’ HIV serostatus (infected, not infected, or unknown); types of sexual activity (oral, vaginal,

or anal sex) and whether condoms are used; and barriers to abstinence or correct condom use (e.g., difficulty talking with partners about or disclosing HIV serostatus, alcohol and other drug use before or during sex). Also, because the risk for perinatal HIV transmission is high without appropriate intervention, clinicians are advised to assess whether women of childbearing age might be pregnant, are interested in becoming pregnant, or are not specifically considering pregnancy but are sexually active and not using reliable contraception (39,56,57). Women who are unable to become pregnant because of elective sterilization, hysterectomy, salpingo-oophorectomy, or other medical reasons might be less likely to use condoms because of a lack of concern for contraception; these women should be counseled regarding the need for use of condoms to prevent transmission of HIV. Patients who wish to conceive and whose partner is not infected also might engage in risky behavior. Patients interested in pregnancy, for themselves or their partner, should be referred to a reproductive health specialist (58).

Injection-drug-related behaviors important to address in screening include whether the patient has been injecting illicit drugs; whether the patient has been sharing needles and syringes or other injection equipment; how many partners the patient has shared needles with; whether needle-sharing partners are known to be HIV infected, not infected, or of

BOX 1. Examples of screening strategies to elicit patient-reported risk for human immunodeficiency virus (HIV) transmission*

Open-ended question by clinician, similar to one of the following:

- “What are you doing now that you think may be a risk for transmitting HIV to a partner?”
- “Tell me about the people you’ve had sex with recently.”
- “Tell me about your sex life.”

Screening questions (checklist) for use with a self-administered questionnaire; computer-, audio-, or video-assisted questionnaire; or a face-to-face interview: †§

“Since your last checkup here,” or, if first visit, “Since you found out you were infected with HIV,”:

- “Have you been sexually active; that is, have you had vaginal, anal, or oral sex with a partner?”

If yes

— “Have you had vaginal or anal intercourse without a condom with anyone?”

If yes

— “Were any of these people HIV-negative, or are you unsure about their HIV status?”

— “Have you had oral sex with someone?”

If yes

— (For a male patient) “Did you ejaculate into your partner’s mouth?”

- “Have you had a genital sore or discharge, discomfort when you urinate, or anal burning or itching?”
- “Have you been diagnosed or treated for a sexually transmitted disease (STD), or do you know if any of your sex partners have been diagnosed or treated for an STD?”
- “Have you shared drug-injection equipment (needles, syringes, cotton, cooker, water) with others?”

If yes

— “Were any of these people HIV negative, or are you unsure about their HIV status?”

* Source: Adapted from CDC. Revised guidelines for HIV counseling, testing, and referral. MMWR 2001;50(No. RR-19).

† This checklist can be administered by the patient or clinician and should take approximately 4 minutes.

§ A positive response to any of the screening questions should cue the clinician to have a more in-depth discussion to ensure that specific risks are clearly understood.

unknown HIV serostatus; whether the patient has been using new or sterilized needles and syringes; and what barriers exist to ceasing illicit drug use or, failing that, to adopting safer injection practices (e.g., lack of access to sterile needles and syringes).

Approaches to Screening for Behavioral Risk Factors

The most effective manner for screening for behavioral risk factors is not well defined; however, simple approaches are more acceptable to both patients and health-care providers (53). Screening tools should be designed to be as sensitive as possible for identifying behavioral risks; a more detailed, personalized assessment can then be used to improve specificity and provide additional detail. The sensitivity of screening instruments depends on obtaining accurate information. However, accuracy of information can be influenced by a variety of factors: recall, misunderstanding about risk, legal concerns, concern about confidentiality of the information and how the information will be used, concern that answers may affect ability to receive services, concern that answers may affect social desirability (i.e., the tendency to provide responses that will avoid criticism), and the desire for social approval (the tendency to seek praise) (45,55). Interviewer factors also influence the accuracy of information. Surveys indicate that patients are more likely to discuss risk behaviors if they perceive their clinicians are comfortable talking about stigmatized topics such as sex and drug use (46–49) and are nonjudgmental, empathetic, knowledgeable, and comfortable counseling patients about sexual risk factors (41,46–50). These factors need to be considered when interpreting responses to screening questions. To the extent possible, screening and interventions should be individualized to meet patient needs. Examples of two screening approaches are provided (Box 1).

Incorporating Screening for Behavioral Risk Factors into the Office Visit

Before the patient is seen by the clinician, screening for behavioral risks can be done with a self-administered questionnaire; a computer-, audio-, or video-assisted questionnaire; or a brief interview with ancillary staff; the clinician can then review the results on the patient's medical record. Alternatively, behavioral risk screening can be done during the medical encounter (e.g., as part of the history); either open-ended questions or a checklist approach with in-depth discussion about positive responses can be used (Box 1). Because, given patients' immediate health needs, it can be difficult in the clinical care setting to remember less urgent matters such as risk screening and harm reduction, provider reminder systems (e.g., computerized reminders) have been used by health-care systems to

help ensure that recommended procedures are done regularly. Multicomponent health-care system interventions that include a provider reminder system and a provider education program are effective in increasing delivery of certain prevention services (59). Risk screening might be more likely to occur in managed care settings if the managed care organization specifically calls for it (60).

Screening for Clinical Risk Factors

Screening for STDs

Recommendations for preventive measures, including medical screening and vaccinations, that should be included in the care of HIV-infected persons (16,21,39,44,54,61–69) have been published previously. This report is not intended to duplicate existing recommendations; it addresses screening specifically to identify clinical factors associated with increased risk for transmission of HIV from infected to noninfected persons. In this context, STDs are the primary infections of concern for three reasons. First, the presence of STDs often suggests recent or ongoing sexual behaviors that may result in HIV transmission. Second, many STDs enhance the risk for HIV transmission or acquisition (22,70–73). Early detection and treatment of bacterial STDs might reduce the risk for HIV transmission. Third, identification and treatment of STDs can reduce the potential for spread of these infections among high-risk groups (i.e., sex or drug-using networks).

Screening and diagnostic testing serve distinctly different purposes. By definition, screening means testing on the basis of risk estimation, regardless of clinical indications for testing, and is a cornerstone of identifying persons at risk for transmitting HIV to others. Clinicians should routinely ask about STD symptoms, including urethral or vaginal discharge; dysuria; intermenstrual bleeding; genital or anal ulcers or other lesions; anal pain, pruritus, burning, discharge, or bleeding; and, for women, lower abdominal pain with or without fever. Regardless of reported sexual behavior or other epidemiologic risk information, the presence of such symptoms should always prompt diagnostic testing and, when appropriate, treatment. However, clinical symptoms are not sensitive for identifying many infections because most STDs are asymptomatic (74–81); therefore, laboratory screening of HIV-infected persons is an essential tool for identifying persons at risk for transmitting HIV and other STDs.

Laboratory Testing for STDs

Identification of syphilis requires direct bacteriologic (i.e., dark-field microscopy) or serologic testing. However, noninvasive, urine-based nucleic acid amplification tests

(NAATs) have greatly simplified testing for *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. Although they are more costly than other screening tests, their ease of use and sensitivity—similar to the sensitivity of culture for detection of *N. gonorrhoeae* and substantially higher than the sensitivity of all other tests for *C. trachomatis* (including culture)—for detecting genital infection are great advantages. Detection of rectal or pharyngeal gonorrhea still requires culture. Pharyngeal infection with *C. trachomatis* is uncommon, and routine screening for it is not recommended (63,82). NAATs have not been approved for use with specimens collected from sites other than the urethra, cervix, or urine. Recommended screening strategies and

diagnostic tests for detecting asymptomatic STDs are described (Box 2, Table 3).

Local and state health departments have reporting requirements, which vary among states, for HIV and other STDs. Clinicians need to be aware of and comply with requirements for the areas in which they practice; information on reporting requirements can be obtained from health departments.

Screening for Pregnancy

Women of childbearing age should be questioned during routine visits about the possibility of pregnancy. Women who state that they suspect pregnancy or have missed their menses

BOX 2. Examples of laboratory screening strategies to detect asymptomatic sexually transmitted diseases*

First Visit

For all patients

- Test for syphilis: nontreponemal serologic test (e.g., rapid plasma reagin [RPR] or Venereal Disease Research Laboratory [VDRL] test).
- Consider testing for urogenital gonorrhea: urethral (men) or cervical (women) specimen for culture, or urethral/cervical specimen or first-catch urine[†] (men and women) nucleic acid amplification test (NAAT) for *Neisseria gonorrhoeae*.[§]
- Consider testing for urogenital chlamydial infection: urethral (men) or cervical (women) specimen or first-catch urine[†] (men and women) specimen for NAAT for *Chlamydia trachomatis*.[§]

For women

- Test for trichomoniasis: wet mount examination or culture of vaginal secretions for *Trichomonas vaginalis*.
- Test for urogenital chlamydia: cervical specimen for NAAT for *C. trachomatis*[§] for all sexually active women aged ≤ 25 years and other women at increased risk, even if asymptomatic.

For patients reporting receptive anal sex

- Test for rectal gonorrhea: anal swab culture for *N. gonorrhoeae*.[§]
- Test for rectal chlamydia: anal swab culture for *C. trachomatis*,[§] if available.

For patients reporting receptive oral sex

- Test for pharyngeal gonococcal infection: culture for *N. gonorrhoeae*.[§]

Subsequent Routine Visits

- The tests described here should be repeated periodically (i.e., at least annually) for all patients who are sexually active. More frequent periodic screening (e.g., at 3-month to 6-month intervals) may be indicated for asymptomatic persons at higher risk. Presence of any of the following factors may support more frequent than annual periodic screening: 1) multiple or anonymous sex partners; 2) past history of any STD; 3) identification of other behaviors associated with transmission of HIV and other STDs; 4) sex or needle-sharing partner(s) with any of the above-mentioned risks; 5) developmental changes in life that may lead to behavioral change with increased risky behaviors (e.g., dissolution of a relationship); or 6) high prevalence of STDs in the area or in the patient population.

* These recommendations apply to persons without symptoms or signs of STDs. Patients with symptoms (e.g., urethral or vaginal discharge; dysuria; intermenstrual bleeding; genital or anal lesions; anal pruritus, burning, or discharge; and lower abdominal pain with or without fever) or known exposure should have appropriate diagnostic testing regardless of reported sexual behavior or other risk factors.

[†] First-catch urine (i.e., the first 10–30 mL of urine voided after initiating the stream) should be used.

[§] The yield of testing for *N. gonorrhoeae* and *C. trachomatis* is likely to vary, and screening for these pathogens should be based on consideration of patient's risk behaviors, local epidemiology of these infections, availability of tests (e.g., culture for *C. trachomatis*), and cost. Appropriate diagnostic tests for different pathogens causing STDs are described (Table 3).

Note: Testing or vaccination for hepatitis, pneumococcal disease, influenza, and other infectious diseases (e.g., screening pregnant women for syphilis, gonorrhea, chlamydia, and hepatitis B surface antigen) should be incorporated into the routine care of HIV-infected persons as recommended elsewhere (16,21,39,44,54,61–67).

Note: Symptomatic and asymptomatic herpes simplex virus (HSV) infection, especially with HSV type 2, is prevalent among HIV-infected persons and might increase the risk of transmitting and acquiring HIV. Therefore, some HIV specialists recommend routine, type-specific serologic testing for HSV-2. Patients with positive results should be informed of the increased risk of transmitting HIV and counseled regarding recognition of associated symptoms (16,54,67). Only tests for detection of HSV glycoprotein G are truly type-specific and suitable for HSV-2 serologic screening.

Note: Local and state health departments have reporting requirements for HIV and other STDs, which vary among states. Clinicians should be aware of and comply with requirements for the areas in which they practice; information on reporting requirements can be obtained from health departments.

TABLE 3. Available diagnostic testing for detection of sexually transmitted diseases (STDs)*

STD	Diagnostic test†
Syphilis	Dark-field examination or direct fluorescent antibody test of exudate of lesion Serum nontreponemal tests, rapid plasma reagin (RPR), or Venereal Disease Research Laboratory (VDRL) for screening followed by serum treponemal tests (e.g., fluorescent treponemal antibody absorbed [FTA-ABS] or <i>Treponema pallidum</i> particle agglutination [TP-PA])
Trichomoniasis	Microscopic examination of wet mount or culture of vaginal secretions
Herpes	Viral culture of genital or other mucocutaneous ulcers Herpes simplex virus type-specific serologic tests
Gonorrhea	
Female genitourinary [GU] tract	Culture of endocervical swab specimen Nucleic acid amplification tests (NAAT) of endocervical swab specimen NAAT of urine§
Male GU tract	Culture of intraurethral swab NAAT of intraurethral swab NAAT of urine§
Rectum/pharynx specimen	Culture of rectal or pharyngeal swab specimen with selective medium
Chlamydia	
Female GU tract	NAAT of endocervical swab specimen NAAT of urine§ Unamplified nucleic acid hybridization test, enzyme immunoassay, or direct fluorescent antibody test of endocervical swab specimen Culture of endocervical swab specimen
Male GU tract	NAAT of intraurethral swab specimen NAAT of urine§ Non-NAAT or culture of intraurethral swab specimen
Rectum/pharynx	Culture of rectal or pharyngeal swab specimen¶ Direct fluorescent antibody test performed on rectal or pharyngeal swab specimen¶

* **Source:** CDC. Sexually transmitted diseases treatment guidelines, 2002. MMWR 2002;51(No. RR-6). CDC Screening tests to detect *Chlamydia trachomatis* and *Neisseria gonorrhoeae* infections—2002. MMWR 2002;51(No. RR-15).

† Diagnostic tests are listed in order of preference for recommendation, with the most highly recommended test listed first. Alternative tests should be performed if a specimen cannot be obtained or if the preferred test is not available.

§ NAAT of urine is less sensitive than that of an endocervical or intraurethral swab specimen.

¶ *Chlamydia trachomatis*-major outer membrane protein (MOMP)-specific stain should be used.

should be tested for pregnancy. Early pregnancy diagnosis would benefit even women not receiving antiretroviral treatment because they could be offered treatment to decrease the risk for perinatal HIV transmission.

Behavioral Interventions

Behavioral interventions are strategies designed to change persons' knowledge, attitudes, behaviors, or practices in order to reduce their personal health risks or their risk of transmitting HIV to others (Table 4). Behavioral change can be facilitated by environmental cues in the clinic or office setting, messages delivered to patients by clinicians or other qualified staff on-site, or referral to other persons or organizations providing prevention services. Because behavior change often occurs in incremental steps, a brief behavioral intervention

conducted at each clinic visit could result in patients, over time, adopting and maintaining safer practices. Behavioral interventions should be appropriate for the patient's culture, language, sex, sexual orientation, age, and developmental level (44). In settings where care is delivered to HIV-infected adolescents, for example, approaches need to be specifically tailored for this age group (83). Also, clinicians should be aware of and adhere to all laws and regulations related to providing services to minors.

Structural Approaches To Support and Enhance Prevention

Clinic or office environments can be structured to support and enhance prevention. All patients, especially new patients, should be provided printed information about HIV transmission risks, preventing transmission of HIV to others, and

TABLE 4. Recommendations for behavioral interventions to reduce human immunodeficiency virus (HIV) transmission risk

Recommendation	Rating
Clinics or office environments where patients with HIV infection receive care should be structured to support and enhance HIV prevention.	B-III (for enhancing patient recall of prevention messages)
Within the context of HIV care, brief general HIV prevention messages should be regularly provided to HIV-infected patients at each visit or periodically, as determined by the clinician, and at a minimum of twice yearly. These messages should emphasize the need for safer behaviors to protect their own health and the health of their sex or needle-sharing partners, regardless of perceived risk. Messages should be tailored to the patient's needs and circumstances.	A-III (for efficacy in promoting safer behaviors)
Patients should have adequate, accurate information regarding factors that influence HIV transmission and methods for reducing the risk for transmission to others, emphasizing that the most effective methods for preventing transmission are those that protect noninfected persons against exposure to HIV (e.g., sexual abstinence; consistent and correct use of condoms made of latex, polyurethane or other synthetic materials; and sex with only a partner of the same HIV status). HIV-infected patients who engage in high-risk sexual practices (i.e., capable of resulting in HIV transmission) with persons of unknown or negative HIV serostatus should be counseled to use condoms consistently and correctly.	A-III (for using brief clinician-delivered messages to influence patient behavior)
Patients' misconceptions regarding HIV transmission and methods for reducing risk for transmission should be identified and corrected. For example, ensure that patients know that 1) per-act estimates of HIV transmission risk for an individual patient vary according to behavioral, biologic, and viral factors; 2) highly active antiretroviral therapy (HAART) cannot be relied upon to eliminate the risk of transmitting HIV to others; and 3) nonoccupational postexposure prophylaxis is of uncertain effectiveness for preventing infection in HIV-exposed partners.	A-III (for using brief clinician-delivered messages to influence patient behavior)
Tailored HIV prevention interventions, using a risk-reduction approach, should be delivered to patients at highest risk for transmitting HIV.	A-III (for efficacy in promoting safer behaviors)
After initial prevention messages are delivered, subsequent longer or more intensive interventions in the clinic or office should be delivered, if feasible.	A-I (for efficacy of multisession, clinic-based interventions in promoting safer behaviors)
HIV-infected patients should be referred to appropriate services for issues related to HIV transmission that cannot be adequately addressed during the clinic visit.	A-I (for efficacy of HIV prevention interventions conducted in nonclinic settings)
Persons who inject illicit drugs should be strongly encouraged to cease injecting and enter into substance abuse treatment programs (e.g., methadone maintenance) and should be provided referrals to such programs.	A-II (for reducing risky drug use and associated sexual behaviors)
Persons who continue to inject drugs should be advised to always use sterile injection equipment and to never reuse or share needles, syringes, or other injection equipment and should be provided information regarding how to obtain new, sterile syringes and needles (e.g., syringe exchange program).	A-II (for reducing risk for HIV transmission)

preventing acquisition of other STDs. Information can be disseminated at various locations in the clinic; for example, posters and other visual cues containing prevention messages can be displayed in examination rooms and waiting rooms. These materials usually can be obtained through local or state health department HIV/AIDS and STD programs or from the National Prevention Information Network (NPIN) (1-800-458-5231; <http://www.cdcnpin.org>). Additionally, condoms should be readily accessible at the clinic. Repeating prevention messages throughout the patient's clinic visit reinforces their importance, increasing the likelihood that they will be remembered (68).

Interventions Delivered On-Site

Prevention Messages for All Patients

All HIV-infected patients can benefit from brief prevention messages emphasizing the need for safer behaviors to protect

both their own health and the health of their sex or needle-sharing partners. These messages can be delivered by clinicians, nurses, social workers, case managers, or health educators. They include discussion of the patient's responsibility for appropriate disclosure of HIV serostatus to sex and needle-sharing partners. Brief clinician-delivered approaches have been effective with a variety of health issues, including depression (84), smoking (85–90), alcohol abuse (91,92), weight and diet (93), and physical inactivity (94). This diverse experience with other health behaviors suggests that similar approaches may be effective in reducing HIV-infected patients' transmission risk behaviors. For patients already taking steps to reduce their risk of transmitting HIV, hearing the messages can reinforce continued risk-reduction behaviors. These patients should be commended and encouraged to continue these behaviors.

General HIV Prevention Messages

Patients frequently have inadequate information regarding factors that influence HIV transmission and methods for

preventing transmission. The clinician should ensure that patients understand that the most effective methods for preventing HIV transmission remain those that protect noninfected persons against exposure to HIV. For sexual transmission, the only certain means for HIV-infected persons to prevent sexual transmission to noninfected persons are sexual abstinence or sex with only a partner known to be already infected with HIV. However, restricting sex to partners of the same serostatus does not protect against transmission of other STDs or the possibility of HIV superinfection unless condoms of latex, polyurethane, or other synthetic materials are consistently and correctly used. Superinfection with HIV has been reported and appears to be rare, but its clinical consequences are not known (95,96). For injection-related transmission, the only certain means for HIV-infected persons to prevent transmission to noninfected persons are abstaining from injection drug use or, for IDUs who are unable or unwilling to stop injecting drugs, refraining from sharing injection equipment (e.g., syringes, needles, cookers, cottons, water) with other persons. Neither antiretroviral therapy for HIV-infected persons nor postexposure prophylaxis for partners is a reliable substitute for adopting and maintaining behaviors that guard against HIV exposure (97).

Identifying and Correcting Misconceptions

Patients might have misconceptions about HIV transmission (98), particularly with regard to the risk for HIV transmission associated with specific behaviors, the effect of antiretroviral therapy on HIV transmission, or the effectiveness of postexposure prophylaxis for nonoccupational exposure to HIV.

Risk for HIV Transmission Associated with Specific Sexual Behaviors. Patients often ask their clinicians about the degree of HIV transmission risk associated with specific sexual activities. Numerous studies have examined the risk for HIV transmission associated with various sex acts (99–113). These studies indicate that some sexual behaviors do have a lower average per-act risk for transmission than others and that replacing a higher-risk behavior with a relatively lower-risk behavior might reduce the likelihood that HIV transmission will occur. However, risk for HIV transmission is affected by numerous biological factors (e.g., host genetics, stage of infection, viral load, coexisting STDs) and behavioral factors (e.g., patterns of sexual and drug-injection partnering) (105,114), and per-act risk estimates based on models that assume a constant per-contact infectivity could be inaccurate (110,113). Thus, estimates of the absolute per-episode risk for transmission associated with different activities could be highly misleading when applied to a specific patient or situation. Further the relative risks of becoming infected with HIV, from the

perspective of a person not infected with HIV, might vary greatly according to the various choices related to sexual behavior (Table 5) (115,116).

Effect of Antiretroviral Therapy on HIV Transmission. High viral load is a major risk factor for HIV transmission (117–125). Among untreated patients, the risk for HIV transmission through heterosexual contact has been shown to increase approximately 2.5-fold for each 10-fold increase in plasma viral load (126) (Table 6). By lowering viral load, antiretroviral therapy might reduce risk for HIV transmission, as has been demonstrated with perinatal transmission (127,128) and indirectly suggested for transmission via genital secretions (semen and cervicovaginal fluid) (2,129–133). However, because HIV can be detected in the semen, rectal secretions, female genital secretions, and pharynx of HIV-infected patients with undetectable plasma viral loads (16,134–137) and because consistent reduction of viral load depends on high

TABLE 5. Estimated per-act relative risk for a person without human immunodeficiency virus (HIV) infection acquiring HIV infection, based on sex act* and condom use†

Risk factor	Relative risk for a person without HIV infection of acquiring HIV infection
Sex act	
Insertive fellatio [§]	1
Receptive fellatio [§]	2
Insertive vaginal sex [¶]	10
Receptive vaginal sex [¶]	20
Insertive anal sex [¶]	13
Receptive anal sex [¶]	100
Condom use	
Yes**	1
No**	20

Note: This table quantifies the relative risk for HIV transmission in a way that can help compare the effects of a person's choices of sex act and condom use. It is presented from the point of view of a person without HIV infection and should be used to educate the HIV-infected patient regarding risks for transmission to partners who are not HIV infected or have unknown HIV serostatus. These risks are estimated from available data. Risks can vary depending on several factors, including presence of STDs in either partner and the HIV-infected partner's viral load. In addition, the relative frequency of performance of higher- and lower-risk sex acts will affect risk for transmission (see Prevention Messages for All Patients).

Note: The risks of these choices are multiplicative. Compared with the lowest relative risk (performing insertive fellatio using a condom; referent group, RR = 1), the overall relative risk increases to 2,000 when performing receptive anal sex (RR = 100) without a condom (RR = 20).

* Data regarding risk for transmission from sharing drug injection equipment are too limited to be included in this table.

† **Source:** Varghese B, Maher JE, Peterman TA, Branson BM, Steketee RW. Reducing the risk of sexual HIV transmission: quantifying the per-act risk for HIV infection based on choice of partner, sex act, and condom use. *Sex Transm Dis* 2002;29:38–43.

§ Best guess estimate, from Varghese et al.

¶ **Source:** European Study Group. Comparison of female-to-male and male-to-female transmission of HIV in 563 stable couples. *BMJ* 1992;304:809–13.

** **Source:** Macaluso JM, Kelaghan J, Artz L, et al. Mechanical failure of the latex condom in a cohort of women at high STD risk. *Sex Transm Dis* 1999;26:450–8.

TABLE 6. Adjusted rate ratios of the risk for transmission and acquisition of human immunodeficiency virus type 1 (HIV-1) among discordant partners*

Serum viral load of HIV-infected partners (copies/mL) [†]	Risk for transmission to partners not infected with HIV (adjusted rate ratio; 95% confidence interval)
<3500	Referent
3500–9999	5.80 (2.26–17.80)
10,000–49,999	6.91 (2.96–20.15)
>50,000	11.87 (5.02–34.88)
Per log increment viral load	2.45 (1.85–3.26)

* **Source:** Quinn TC, Wawer MJ, Sewankambo N, et al. Viral load and heterosexual transmission of human immunodeficiency virus type 1 from mother to infant. *N Engl J Med* 1996;335:1621–9.

[†] Patients in this study did not receive antiretroviral medications, and those with low viral loads might have been long-term nonprogressors. Risks might not be equivalent for treated persons with low viral loads. Viral load in the blood may not be predictive of viral load in the genital tract; therefore, risks may vary with genital tract viral load.

adherence to antiretroviral regimens, the clinician should assume that all patients who are receiving therapy, even those with undetectable plasma HIV levels, can still transmit HIV. Patients who have treatment interruptions, whether scheduled or not, should be advised that this will likely lead to a rise in plasma viral load and increased risk for transmission. Another concern related to adherence to antiretroviral therapy is the development of drug-resistant mutations with subsequent transmission of drug-resistant viral strains. Several reports suggest that transmission of drug-resistant HIV occurs in the United States (138–141). Recent reports suggest that drug-resistant HIV strains might be less easily transmitted than wild-type virus (142), but these data are limited and their significance is unclear.

Effectiveness of Postexposure Prophylaxis for Nonoccupational Exposure to HIV. Although the U.S. Public Health Service recommends using antiretroviral drugs to reduce the likelihood of acquiring HIV infection from occupational exposure (e.g., accidental needle sticks received by health care workers) (143), limited data are available on efficacy of prophylaxis for nonoccupational exposure (97,143–147). Observational data suggesting effectiveness have been reported (148); however, postexposure prophylaxis might not protect against infection in all cases, and effectiveness of these regimens might be further hindered by lack of tolerability, potential toxicity, or viral resistance. Thus, avoiding exposure remains the best approach to preventing transmission, and the potential availability of postexposure prophylaxis should not be used as justification for engaging in risky behavior.

Tailored Interventions for Patients at High Risk for Transmitting HIV

Interventions tailored to the individual patient's risks can be delivered to patients at highest risk for transmitting HIV

infection and for acquiring new STDs. This includes patients whose risk screening indicates current sex or drug-injection practices that may lead to transmission, who have a current or recent STD, or who have mentioned items of concern in discussions with the clinician (149,150). Any positive results of screening for behavioral risks or STDs should be addressed in more detail with the patient so a more thorough risk assessment can be done and an appropriate risk-reduction plan can be discussed and agreed upon.

Although the efficacy of brief clinician-delivered interventions with HIV-infected patients has not been studied extensively, substantial evidence exists for the efficacy of provider-delivered, tailored messages for other health concerns (151–155). An attempt should be made to determine which of the patient's risk behaviors and underlying concerns can be addressed during clinic visits and which might require referral (Box 3).

At a minimum, an appropriate referral should be made and the patient should be informed of the risks involved in continuing the behavior. HIV-infected persons who remain sexually active should be reminded that the only certain means for preventing transmission to noninfected persons is to restrict sex to partners known to be already infected with HIV and that they have a responsibility for disclosure of HIV serostatus to prospective sex partners. For mutually consensual sex with a person of unknown or discordant HIV serostatus, consistent and correct use of condoms made of latex, polyurethane, or other synthetic materials can substantially reduce the risk for HIV transmission. Also, some sex acts have relatively less risk for HIV transmission than others (Table 5). For HIV-infected patients who continue injection drug use, the provider should emphasize the risks associated with sharing needles and should provide information regarding substance abuse treatment and access to clean needles (Box 4) (156–158). Examples of targeted motivational messages on condom use and needle sharing are provided (Figures 1 and 2), and providers can individualize their own messages using these as a guide.

Clinician Training

Clinicians can prepare themselves to deliver HIV prevention messages and brief behavioral interventions to their patients by 1) developing strategies for incorporating HIV risk-reduction interventions into patients' clinic visits (159); 2) obtaining training on speaking with patients about sex and drug-use behaviors and on giving explanations in simple, everyday language (68,87,160,161); 3) becoming familiar with interventions that have demonstrated effectiveness (162); 4) becoming familiar with the underlying causes of and concerns related to risk behaviors among HIV-infected persons

BOX 3. Examples of which concerns to address and which to refer**Topics that can be successfully addressed by clinicians and clinic support staff:**

- lack of knowledge about HIV transmission risks;
- misconceptions about risk of specific types of sexual and drug-use practices;
- misconceptions about viral load and transmission of HIV;
- how to disclose HIV-seropositive status to a sex partner, family member, or friend;
- importance of using condoms or not exchanging fluids with partners;
- ways to reduce number of sex or drug partners;
- ways to keep condoms accessible;
- ways to remember to use condoms;
- how to persuade a sex partner to use a condom;
- ways to obtain support (e.g., emotional, financial) from family, friends, and lovers;
- ways to clean/disinfect injection equipment;
- ways to obtain clean needles;
- ways to avoid sharing injection equipment; or
- ways to deal with mild psychological distress stemming from situational circumstances.

Issues that might need referral to outside agencies

- need for intensive HIV prevention intervention;
- excessive use of alcohol or recreational drug use;
- drug addiction, including injection drug use;
- depression, anger, guilt, fear, or other mental health needs;
- need for social support;
- sexual compulsivity;
- sexual or physical abuse (victim or perpetrator);
- desire to have children, contraceptive counseling;
- housing or transportation needs;
- nutritional needs;
- financial emergencies;
- child custody, parole, or other legal matters; or
- insurance coverage.

(e.g., domestic violence) (13,163); and 5) becoming familiar with community resources that address risk reduction. Free training on risk screening and prevention can be obtained at CDC-funded STD/HIV Prevention Training Centers (<http://depts.washington.edu/nnptc>) and HRSA-funded AIDS Education and Training Centers (<http://www.aids-ed.org>), which also offer continuing medical education credit for this training. Ongoing training will help clinicians refine their counseling skills as well as keep current with prevention concerns at the community level, thus increasing their ability to appropriately counsel and provide support to patients.

BOX 4. Examples of messages that should be communicated to drug users who continue to inject*

Persons who inject drugs should be regularly counseled to do the following:

- Stop using and injecting drugs.
- Enter and complete substance abuse treatment, including relapse prevention.
- Take the following steps to reduce personal and public health risks, if they continue to inject drugs:
 - Never reuse or share syringes, water, or drug preparation equipment.
 - Use only syringes obtained from a reliable source (e.g., pharmacies).
 - Use a new, sterile syringe to prepare and inject drugs.†
 - If possible, use sterile water to prepare drugs; otherwise, use clean water from a reliable source (such as fresh tap water).
 - Use a new or disinfected container (cooker) and a new filter (cotton) to prepare drugs.
 - Clean the injection site with a new alcohol swab before injection.
 - Safely dispose of syringes after one use.

In addition, drug users should be provided information regarding how to prevent HIV transmission through sexual contact and, for women, information regarding reducing the risk of mother-to-infant HIV transmission.

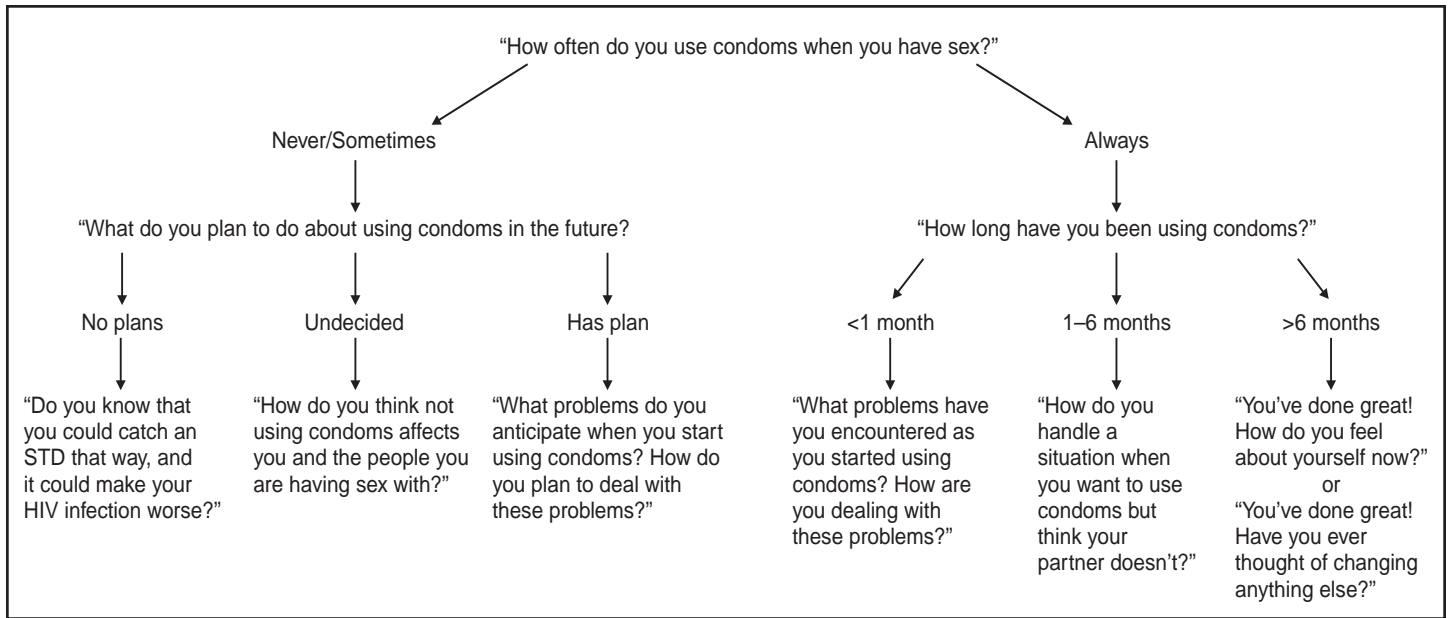
* **Source:** US Department of Health and Human Services. Medical advice for persons who inject illicit drugs. HIV Prevention Bulletin. CDC; Health Resources and Services Administration; National Institute on Drug Abuse, National Institutes of Health; Center for Substance Abuse and Mental Health Services Administration. May 1997. Available at http://www.cdc.gov/idu/pubs/hiv_prev.htm.

† If new, sterile syringes and other drug preparation and injection equipment are not available, previously used equipment should be boiled or disinfected with bleach by using the methods recommended by CDC (**Source:** CDC National Prevention Information Network. HIV connect. Vol. 11, No.8. Available at <http://www.cdcnpi.org>).

Ongoing Delivery of Prevention Messages

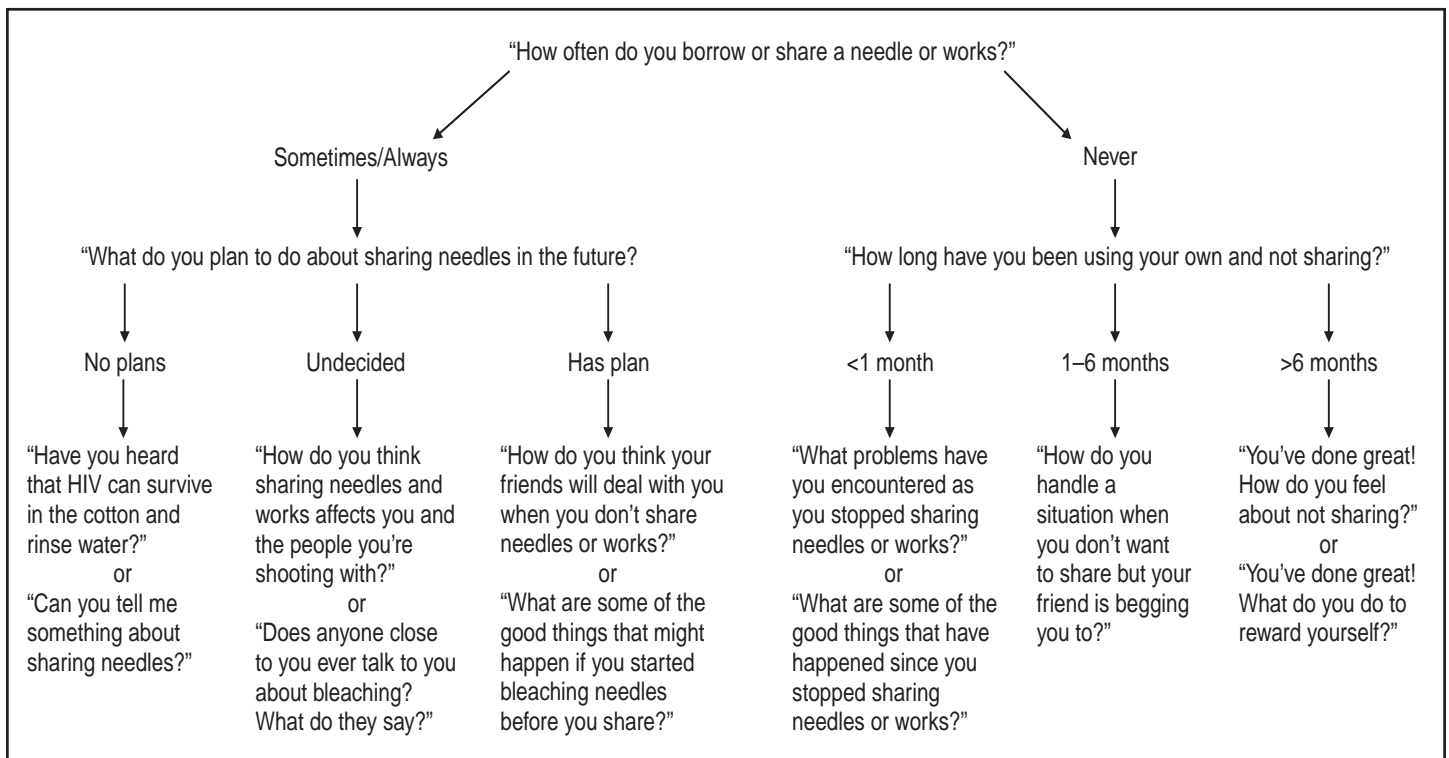
Prevention messages can be reinforced by subsequent longer or more intensive interventions in clinic or office environments by nurses, social workers, or health educators. Advantages of a multidisciplinary approach are that skill sets vary among staff members from various disciplines and that a patient may be more receptive to discussing prevention-related issues with one team member than with another. For HIV-negative persons or persons of unknown HIV serostatus, randomized controlled trials provide strong evidence for the efficacy of short, one- or two-session interventions (164–170) and for longer or multisession interventions in clinics for individuals and groups (164,171–173). For example, for persons who continue to engage in risky behaviors, CDC recommends client-centered counseling, a specific model of HIV prevention counseling

FIGURE 1. Example of tailoring messages regarding condom use for sexually active, HIV-infected persons



* This is an example, not a comprehensive list of all questions that could be asked

FIGURE 2. Example of tailoring messages regarding needle sharing for HIV-infected persons who continue to inject drugs



* This is an example, not a comprehensive list of all questions that could be asked

(44,164). Evidence for the efficacy of multisession interventions for HIV-infected patients, individually or in groups, in clinical settings is limited to a few randomized, controlled trials (69,174,175) and other studies that might not have assessed behavioral outcomes (6,176–180). The studies of single-session interventions for individual HIV-infected patients in clinical settings have not been randomized controlled trials (181–187).

Referrals for Additional Prevention Interventions and Other Services

Types of Referrals

Certain patients need more intensive or ongoing behavioral interventions than can feasibly be provided in medical care settings (44). Many have underlying problems that impede adoption of safer behaviors (e.g., homelessness, substance abuse, mental illness), and achieving behavioral change is often dependent on addressing these concerns. Clinicians will usually not have time or resources to fully address these issues, many of which can best be addressed through referrals for services such as intensive HIV prevention interventions (e.g., multisession risk-reduction counseling, support groups), medical services (e.g., family planning and contraceptive counseling, substance abuse treatment), mental health services (e.g., treatment of depression, counseling for sexual compulsivity), and social services (e.g., housing, child care and custody, protection from domestic violence). For example, all patients should be made aware of their responsibility for appropriate disclosure of HIV serostatus to sex and needle-sharing partners; however, full consideration of the complexities of disclosure, including benefits and potential risks, may not be possible in the time available during medical visits (188). Patients who are having, or are likely to have, difficulty initiating or sustaining behaviors that reduce or prevent HIV transmission might benefit from prevention case management. Prevention case management provides ongoing, intensive, one-on-one, client-centered risk assessment and prevention counseling, and assistance accessing other services to address concerns that affect patients' health and ability to change HIV-related risk-taking behavior. For HIV-seronegative persons, randomized controlled trials provide evidence for the efficacy of HIV prevention interventions delivered by health departments and community-based organizations (164,189–198). For HIV-infected persons, efficacy studies of such interventions are limited to a few randomized controlled trials (199–201), only one of which documented change in risk-related behavior (199), and to other studies, the majority of which did not assess behavioral outcomes (7,202–207).

Referrals for IDUs

For IDUs, ceasing injection-drug use is the only reliable way to eliminate the risk of injection-associated HIV transmission; however, most IDUs are unable to sustain long-term abstinence without substance abuse treatment. Several studies have examined the effect of substance abuse treatment, particularly methadone maintenance treatment, on HIV risk behaviors among IDUs (208–210). These include controlled (211–217) and noncontrolled (218–221) cohort studies, case-control studies (222), and observational studies with controls (223,224), and collectively they provide evidence that methadone maintenance treatment reduces risky injection and sexual behaviors and HIV seroconversion. Thus, early entry into substance abuse treatment programs, maintenance of treatment, and sustained abstinence from injecting are crucial for reducing the risk for HIV transmission from infected IDUs. For those IDUs not able or willing to stop injecting drugs, once-only use of sterile syringes can greatly reduce the risk for injection-related HIV transmission. Substantial evidence from cohort, case-control, and observational studies (225) indicates that access to sterile syringes through syringe exchange programs reduces HIV risk behavior and HIV seroconversion among IDUs. Physician prescribing and pharmacy programs can also increase access to sterile syringes (226–231). Disinfecting syringes and other injection equipment by boiling or flushing with bleach when new, sterile equipment is not available has been suggested to reduce the risk for HIV transmission (156); however, it is difficult to reliably disinfect syringes, and this practice is not as safe as using a new, sterile syringe (232–234). Information on access to sterile syringes and safe syringe disposal can be obtained through local health departments or state HIV/AIDS prevention programs.

Engaging the Patient in the Referral Process

When referrals are made, the patient's willingness and ability to accept and complete a referral should be assessed. Referrals that match the patient's self-identified priorities are more likely to be successful than those that do not; the services need to be responsive to the patient's needs and appropriate for the patient's culture, language, sex, sexual orientation, age, and developmental level. For example, adolescents should be referred to behavioral intervention programs and services that work specifically with this population. Discussion with the patient can identify barriers to the patient's completing the referral (e.g., lack of transportation or child care, work schedule, cost). Accessibility and convenience of services predict whether a referral will be completed. The patient should be given specific information regarding accessing referral services and might need assistance (e.g., scheduling appointments, obtaining transportation) in completing referrals. The likelihood that

referrals will be completed successfully could possibly be increased if clinicians or other health-care staff assist patients with making appointments to referral services. When a clinician does not have the capacity to make all appropriate referrals, or when needs are especially complex, a case manager can help make referrals and coordinate care. Outreach workers, peer counselors or educators, treatment advocates, and treatment educators can also help patients identify needs and complete referrals successfully. Health department HIV/AIDS prevention and care programs can provide information on accessing these services. Assessing the success of referrals by documenting referrals made, the status of those referrals, and patient satisfaction with referrals will further assist clinicians in meeting patient needs. Information obtained through follow-up of referrals can identify barriers to completing the referral, responsiveness of referral services to patient needs, and gaps in the referral system, and can be used to develop strategies for removing the barriers.

Referral Guides and Information

Preparation for making patient referrals includes 1) learning about local HIV prevention and supportive social services, including those supported by the Ryan White CARE Act; 2) learning about available resources and having a referral guide listing such resources; and 3) contacting staff in local programs to facilitate subsequent referrals. Referral guides and other information usually can be obtained from local and state health department HIV/AIDS prevention and care programs, which are key sources of information about services available locally. Health departments and some managed care organizations are also a source of educational materials, posters, and other prevention-related material. Health departments can provide or suggest sources of training and technical assistance on behavioral interventions. A complete listing of state AIDS directors and contact information is available from the National Alliance of State and Territorial AIDS Directors (NASTAD) at <http://www.nastad.org>. In addition, information can be obtained from local health planning councils, consortia, and community planning groups; local, state, and national HIV/AIDS information hotlines and Internet websites; and community-based health and human service providers (Box 5).

Examples of Case Situations for Prevention Counseling

1. A patient with newly diagnosed HIV infection comes to your office for initial evaluation. Of the many things that must be addressed during this initial visit (e.g., any emergent medical or psychiatric problems, education about HIV, history, physical, initial laboratory work [if not

BOX 5. Referral resource guide, suggested contents

For each resource, the referral resource guide should specify

- name of the provider or agency;
- range of services provided;
- target population(s);
- service area(s);
- contact names and telephone and fax numbers, street addresses, e-mail addresses;
- hours of operation;
- location;
- competence in providing services appropriate to the patient's culture, language, sex, sexual orientation, age, and developmental level;
- cost for services;
- eligibility;
- application materials;
- admission policies and procedures;
- directions, transportation information, and accessibility to public transportation; and
- patient satisfaction with services.

already done]), how does one address prevention? What is the minimum that should be done, and how can it be incorporated into this visit?

Assuming no emergent issues preclude a complete history and physical examination during this visit, the following should be done:

- During the history, question how the patient might have acquired HIV, current risk behaviors, current partners and whether they have been notified and tested for HIV, and current or past STDs.
- During the physical examination, include genital and rectal examinations, evaluation and treatment of any current STD, or, if asymptomatic, appropriate screening for STDs.
- Discuss current risk behavior, at least briefly. Emphasize the importance of using condoms; address active injection-drug use.
- Discuss the need for disclosure of HIV serostatus to sex and needle-sharing partners, and discuss potential barriers to disclosure.
- Note issues that will require follow-up; e.g., risk behavior that will require continuing counseling and referral and partners who will need to be notified by either the patient or a health department.

2. A patient with chronic, stable HIV comes to you with a new STD. What prevention considerations should be covered in this visit?

For the patient who has had a stable course of disease, a new STD can be a sign of emerging social, emotional, or substance

abuse problems. These potential problems should be addressed in addition to the STD.

- During the history, cover topics related to acquisition of the new STD—number of new partners, number of episodes of unsafe sex, and types of unsafe sex.
- Address the personal risks associated with high-risk behavior, e.g., viral superinfection and HIV/STD interactions.
- Address personal or social problems (including substance abuse and domestic violence) that might have led to a change in behavior resulting in the acquisition of the new STD; refer to social services, if necessary.
- Address other issues (e.g., adherence to HAART) that may be affected by personal or social problems. Check viral load if nonadherence is evident or is suspected.
- During the physical examination, include a careful genital and rectal examination and screen for additional STDs, such as syphilis, trichomoniasis, (for women), chlamydial infection (for sexually active women aged ≤ 25 years and selected populations of men and women), and gonorrhea (for selected populations of men and women).
- Discuss the need for partner notification and referral for counseling and testing.
- Note in the chart that risk behavior should be addressed in future visits and that tailored counseling may be needed for the patient.

3. A patient with chronic, stable HIV has been seen regularly in a health care setting. What should be included in this patient's routine clinical care?

Discussion of sexual and needle-sharing practices should be integrated into a routine part of clinical care.

- Periodically (e.g., annually) screen for STDs. STDs to be included in screening should be determined by patient's sex, history of high-risk behavior, and local epidemiology of selected STDs.
- Reiterate general prevention messages and patient education regarding partner notification, high-risk behaviors associated with transmission, prevention of transmission, or condom use, as deemed appropriate by the clinician.

4. A patient who has been treated with HAART for 2 years comes to you. At the time of treatment initiation, CD4⁺ count was 200 cells/ μ L and the viral load was 50,000 copies/ml. The response to therapy was prompt; CD4⁺ count increased to 500 cells/ μ L, and the viral load has been undetectable since soon after treatment began. The patient now has mildly elevated cholesterol, some mild lipodystrophy, and facial wasting. He states that he would like to stop HAART because of the side effects. What should you tell this patient?

- Inform the patient that upon stopping HAART, CD4⁺ count and viral load will likely return to pretreatment levels with risk for opportunistic infections and progression of immune deficiency.
- Inform the patient that increase in viral load to pretreatment levels will likely result in increased infectiousness and risk for transmission of HIV to sex or needle-sharing partners.
- Counsel the patient regarding the option of changing the HAART regimen to limit progression of metabolic side effects.

Partner Counseling and Referral Services, Including Partner Notification

HIV-infected persons are often not yet aware of their infection; thus, they cannot benefit from early medical evaluation and treatment and do not know that they may be transmitting HIV to others. Reaching such persons as early after infection as possible is important for their own health and is a critical strategy for reducing HIV transmission in the community. Furthermore, interviews of HIV-infected persons in various settings suggest that >70% are sexually active after receiving their diagnosis, and many have not told their partners about their infection (188). Partner counseling and referral services (PCRS), including partner notification, are intended to address these problems by 1) providing services to HIV-infected persons and their sex and needle-sharing partners so the partners can take steps to avoid becoming infected or, if already infected, to avoid infecting others and 2) helping infected partners gain earlier access to medical evaluation, treatment, and other services (Table 7). A key element of PCRS involves informing current partners (and past partners who may have been exposed) that a person who is HIV infected has identified them as a sex or needle-sharing partner and advising them to have HIV counseling and testing (235–238).

Informing partners of their exposure to HIV is confidential; i.e., partners are not told who reported their name or when the reported exposure occurred. It is voluntary in that the infected person decides which names to reveal to the interviewer. Studies have indicated that infected persons are more likely to name their close partners than their more casual partners (204,239,240). Limited reports of partner violence after notification suggest a need for caution, but such violence seems to be rare (241–2). When asked, 92% of notified partners reported that they believe the health department should continue partner notification services (243). No studies have directly shown that PCRS prevents disease in a community.

TABLE 7. Recommendations for partner counseling and referral, including partner notification

Recommendation	Rating
In HIV health-care settings, all applicable requirements for reporting sex and needle-sharing partners of HIV-infected patients to the appropriate health department should be followed.	A-III (for identifying patients who should be referred for partner counseling and referral services [PCRS])
At the initial visit, patients should be asked if all of their sex and needle-sharing partners have been informed of their exposure to HIV.	A-III (for identifying patients who should be referred for PCRS)
At routine follow-up visits, patients should be asked if they have had any new sex or needle-sharing partners who have not been informed of their exposure to HIV.	A-III (for identifying patients who should be referred for PCRS)
All patients should be referred to the appropriate health department to discuss sex and needle-sharing partners who have not been informed of their exposure and to arrange for their notification and referral for HIV testing.	A-I (for increasing partner counseling and referral and voluntary testing of partners)
In HIV health-care settings, access to available community partner counseling and referral resources should be established.	A-III (for establishing a working relationship and increasing understanding about partner counseling and referral procedures)

However, studies have demonstrated that quality HIV prevention counseling can reduce the risk of acquiring a new STD (164) and that persons who become aware of their HIV infection can take steps to protect their health and prevent further transmission (244); in addition, before–after studies have suggested that partners change their behavior after they are notified (245). Finally, compelling arguments have been offered regarding partners' rights to know this information that is important to their health.

Laws and Regulations Related to Informing Partners

The majority of states and some cities or localities have laws and regulations related to informing partners that they have been exposed to HIV. Certain health departments require that, even if a patient refuses to report a partner, the clinician report to the health department any partner of whom he or she is aware. Many states also have laws regarding disclosure by clinicians to third parties known to be at high risk for future HIV transmission from patients known to be infected (i.e., duty to warn) (246). Clinicians should know and comply with any such requirements in the areas in which they practice. With regard to PCRS, clinicians should also be aware of and adhere to all laws and regulations related to providing services to minors.

Approaches to Notifying Partners

Partners can be reached and informed of their exposure by health department staff, clinicians in the private sector, or the infected person. In the only randomized controlled trial that has been conducted to date (175), 35 HIV-infected persons were asked to notify their partners themselves, and 10

partners were notified. Another 39 HIV-infected persons were assigned to health department referral; and for these, 78 partners were notified. Thus, notification by the health department appears to be substantially more effective than notification by the infected person. Other studies, with less rigorous designs, have demonstrated similar results (247,248). Some persons, when asked, prefer to inform their partners themselves. This could have a benefit if partners provide support to the infected person. However, patients frequently find that informing their partners is more difficult than they anticipated. Certain health departments offer contract referral, in which the infected person has a few days to notify his or her partners. If by the contract date the partners have not had a visit for counseling and testing, they are then contacted by the health department. In practice, patients' difficulties in informing their partners usually means notification is done by the health department.

Although clinicians might wish to take on the responsibility for informing partners, one observational study has indicated that health department specialists were more successful than physicians in interviewing patients and locating partners (249). Health departments have staff who are trained to do partner notification and skilled at providing this free, confidential service. These disease intervention specialists can work closely with public and private sector clinicians who treat persons with other STDs. With regard to partner notification, the clinician should be sensitive to concerns of domestic violence or abuse by the informed partner.

All partners should be notified at least once. Persons who continue to have sex with an HIV-infected person despite an earlier notification may have erroneously concluded that someone else was the infected partner. Thus, renotification might be important, although no research is available on renotification.

Additional information, recommendations, and requirements related to PCRS are available through health department HIV/AIDS programs. A complete listing of state AIDS directors and contact information is available from the National Alliance of State and Territorial AIDS Directors (NASTAD) at <http://www.nastad.org>.

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Summary of recommendations for human immunodeficiency virus (HIV) prevention among HIV-infected persons in clinical care settings

Recommendation	Rating*
HIV-infected patients should be screened for behaviors associated with HIV transmission by using a straightforward, nonjudgmental approach. This should be done at the initial visit and subsequent routine visits or periodically, as the clinician feels necessary, but at a minimum of yearly. Any indication of risky behavior should prompt a more thorough assessment of HIV transmission risks.	A-II
At the initial and each subsequent routine visit, HIV-infected patients should be questioned about symptoms of sexually transmitted diseases (STDs) (e.g., urethral or vaginal discharge; dysuria; intermenstrual bleeding; genital or anal ulcers; anal pruritus, burning, or discharge; and, for women, lower abdominal pain with or without fever). Regardless of reported sexual behavior or other epidemiologic risk information, the presence of such signs or symptoms should always prompt diagnostic testing and, when appropriate, treatment.	A-I
At the initial visit	
• All HIV-infected women and men should be screened for laboratory evidence of syphilis. Women should also be screened for trichomoniasis. Sexually active women aged ≤ 25 years and other women at increased risk, even if asymptomatic, should be screened for cervical chlamydial infection.	A-II
• Consideration should be given to screening all HIV-infected men and women for gonorrhea and chlamydial infections. However, because of the cost of screening and the variability of prevalence of these infections, decisions about routine screening for these infections should be based on epidemiologic factors (including prevalence of infection in the community or the population being served), availability of tests, and cost. (Some HIV specialists also recommend type-specific serologic testing for herpes simplex virus type 2 for both men and women.)	B-II
Screening for STDs should be repeated periodically (i.e., at least annually) if the patient is sexually active or if earlier screening revealed STDs. Screening should be done more frequently (e.g., at 3–6-month intervals) for asymptomatic persons at higher risk.	B-III
At the initial and each subsequent routine visit, HIV-infected women of childbearing age should be questioned to identify possible current pregnancy, interest in future pregnancy, or sexual activity without reliable contraception. They should be referred for appropriate counseling, reproductive health care, or prenatal care, as indicated. Women should be asked whether they suspect pregnancy or have missed their menses and, if so, should be tested for pregnancy.	A-I
Clinics or office environments where patients with HIV infection receive care should be structured to support and enhance HIV prevention.	B-III
Within the context of HIV care, brief general HIV prevention messages should be regularly provided to HIV-infected patients at each visit, or periodically, as determined by the clinician, and at a minimum of twice yearly. These messages should emphasize the need for safer behaviors to protect their own health and the health of their sex or needle-sharing partners, regardless of perceived risk. Messages should be tailored to the patient's needs and circumstances.	A-III
Patients should have adequate, accurate information regarding factors that influence HIV transmission and methods for reducing the risk for transmission to others, emphasizing that the most effective methods for preventing transmission are those that protect noninfected persons against exposure to HIV (e.g., sexual abstinence; consistent and correct use of condoms made of latex, polyurethane or other synthetic materials; and sex with only a partner of the same HIV serostatus). HIV-infected patients who engage in high-risk sexual practices (i.e., capable of resulting in HIV transmission) with persons of unknown or negative HIV serostatus should be counseled to use condoms consistently and correctly.	A-III
Patients' misconceptions regarding HIV transmission and methods for reducing risk for transmission should be identified and corrected. For example, ensure that patients know that 1) per-act estimates of HIV transmission risk for an individual patient vary according to behavioral, biologic, and viral factors; 2) highly active antiretroviral therapy (HAART) cannot be relied upon to eliminate the risk of transmitting HIV to others; and 3) nonoccupational postexposure prophylaxis is of uncertain effectiveness for preventing infection in HIV-exposed partners.	A-III
Tailored HIV prevention interventions, using a risk-reduction approach, should be delivered to patients at highest risk for transmitting HIV.	A-III
After initial prevention messages are delivered, subsequent longer or more intensive interventions in the clinic or office should be delivered, if feasible.	A-I
HIV-infected patients should be referred to appropriate services for issues related to HIV transmission that cannot be adequately addressed during the clinic visit.	A-I
Persons who inject illicit drugs should be strongly encouraged to cease injecting and enter into substance abuse treatment programs (e.g., methadone maintenance) and should be provided referrals to such programs.	A-II
Persons who continue to inject drugs should be advised to always use sterile injection equipment and to never reuse or share needles, syringes, or other injection equipment and should be provided information regarding how to obtain new, sterile syringes and needles (e.g., syringe exchange programs).	A-II
In HIV health-care settings, all applicable requirements for reporting sex and needle-sharing partners of HIV-infected patients to the appropriate health department should be followed.	A-III
At the initial visit, patients should be asked if all of their sex and needle-sharing partners have been informed of their exposure to HIV.	A-III
At routine follow-up visits, patients should be asked if they have had any new sex or needle-sharing partners who have not been informed of their exposure to HIV.	A-III
All patients should be referred to the appropriate health department to discuss sex and needle-sharing partners who have not been informed of their exposure and to arrange for their notification and referral for HIV testing.	A-I
In HIV health-care settings, access to available community partner counseling and referral resources should be established.	A-III

* Letters indicate the strength of the recommendation, and roman numerals indicate the quality of evidence supporting it, respectively (see Table 1).



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4. Select your answers to the questions, and mark the corresponding letters on the response form. To receive continuing education credit, you must answer all of the questions. Questions with more than one correct answer will instruct you to "Indicate all that apply."
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Goal and Objectives

This *MMWR* provides recommendations for preventing transmission of human immunodeficiency virus (HIV) by infected persons. These recommendations were developed by CDC, the Health Resources and Services Administration (HRSA), the National Institutes of Health (NIH), the HIV Medical Association (HIVMA) of the Infectious Diseases Society of America (IDSA), and others knowledgeable in HIV prevention. The goal of this report is to provide strategies for persons providing medical care to HIV-infected persons for incorporating HIV prevention into that care. Upon completion of this educational activity, the reader should be able to 1) describe why HIV-prevention efforts in the United States should focus on HIV-infected persons; 2) describe different means of screening HIV-infected patients for HIV-transmission risk behaviors during routine office visits; 3) describe behavioral interventions for HIV-infected persons to prevent HIV transmission; 4) identify reasons for referring HIV-infected persons for additional services; and 5) understand the importance of partner counseling and referral services (PCRS).

To receive continuing education credit, please answer all of the following questions.

1. **Whereas HIV-prevention efforts in the United States had focused on persons who were not HIV-infected, emphasis is now placed on prevention services for HIV-infected persons because . . .**
 - A. HIV-infected persons who are aware of their HIV infection tend to reduce behaviors that might transmit HIV to others.
 - B. bacterial and viral sexually transmitted diseases (STDs) among HIV-infected men and women receiving outpatient care have been increasingly noted, indicating ongoing risky behaviors.
 - C. optimism regarding the effectiveness of highly active antiretroviral therapy (HAART) for HIV might be contributing to relaxed attitudes toward safer sex practices and increased sexual risk-taking by HIV-infected persons.
 - D. all of the above.
2. **All of the following sex-related behaviors are important to address in risk screening except . . .**
 - A. age at first sexual intercourse.
 - B. types of sexual activity (oral, vaginal, or anal sex).
 - C. whether condoms are used.
 - D. barriers to abstinence or correct condom use.
 - E. number, sex, and HIV serostatus of partners.
3. **Key injection-drug-related behaviors to address in screening include whether the patient has been . . .**
 - A. injecting illicit drugs.
 - B. sharing needles and syringes or other injection equipment.
 - C. using new or sterilized needles and syringes.
 - D. all of the above.
4. **Surveys indicate that patients are more likely to discuss risk behaviors if they perceive their clinicians as being . . .**
 - A. comfortable talking about certain topics (e.g., sex and drug use).
 - B. nonjudgmental, empathetic, and knowledgeable.
 - C. comfortable counseling patients regarding sexual risk factors.
 - D. board-certified in infectious diseases.
 - E. A, B, C.
 - F. all of the above.
5. **Screening HIV-infected patients for STDs has critical public health implications because . . .**
 - A. the presence of STDs often indicates recent or ongoing sexual behaviors that can result in HIV transmission.
 - B. substantial evidence indicates that certain STDs enhance the risk for HIV transmission or acquisition.
 - C. identification and treatment of STDs can reduce spread of these infections among groups at high risk (i.e., sex or drug-using networks).
 - D. all of the above.
6. **Which of the following statements regarding screening of HIV-infected patients is not true?**
 - A. At the initial and each subsequent routine visit, all patients should be questioned regarding symptoms of STDs.
 - B. All men should be screened for gonorrhea.
 - C. All women and men should be screened for laboratory evidence of syphilis.
 - D. All women should be screened for trichomoniasis.
7. **Clinical and epidemiologic studies have demonstrated the effectiveness of all of the following methods for preventing HIV transmission except . . .**
 - A. sexual abstinence.
 - B. postexposure prophylaxis for partners.
 - C. consistent and correct use of condoms.
 - D. not sharing needles when injecting drugs.
8. **Which statement concerning partner counseling and referral services (PCRS) is not true?**
 - A. Certain HIV-infected persons are sexually active after receiving their diagnoses but do not tell their partners about their infection.
 - B. PCRS helps infected partners gain earlier access to medical evaluation, treatment, and other services.
 - C. Partners should be told when their HIV exposure occurred.
 - D. The majority of states have laws and regulations related to informing partners who have been exposed to HIV.
9. **Which of the following is not a recommendation related to PCRS?**
 - A. At the initial visit, patients should be asked if all of their sex and needle-sharing partners have been informed of their exposure to HIV.
 - B. At routine follow-up visits, patients should be asked if they have had any new sex or needle-sharing partners who have not been informed of their exposure to HIV.
 - C. Patients should be encouraged to talk to the health department disease-intervention specialist regarding sex and needle-sharing partners who have not been informed of their exposure and to arrange for their referral for testing.
 - D. All partners with whom an HIV-infected person has had sex in the past 15 years should be referred for testing.
10. **Which statement is true regarding referring patients for additional services?**
 - A. Achieving behavioral change is often dependent on addressing patient concerns (e.g., homelessness, substance abuse, or mental illness).
 - B. The majority of injection-drug users are unable to sustain long-term abstinence from drug use without substance abuse treatment.
 - C. Accessibility and convenience of services predict whether a referral will be completed.
 - D. All of the above.
11. **Indicate your work setting.**
 - A. State/local health department.
 - B. Other public health setting.
 - C. Hospital clinic/private practice.
 - D. Managed care organization.
 - E. Academic institution.
 - F. Other.
12. **Which best describes your professional activities?**
 - A. Physician.
 - B. Nurse.
 - C. Health educator.
 - D. HIV-prevention counselor.
 - E. Other.

13. I plan to use these recommendations as the basis for . . . (Indicate all that apply.)
- A. health education materials.
 - B. insurance reimbursement policies.
 - C. local practice guidelines.
 - D. public policy.
 - E. other.
14. Each month, approximately how many patients with HIV do you treat?
- A. None.
 - B. 1–5.
 - C. 6–20.
 - D. 21–50.
 - E. 51–100.
 - F. >100.
15. How much time did you spend reading this report and completing the exam?
- A. <1.5 hours.
 - B. ≥1.5 hours but <2.0 hours.
 - C. ≥2.0 hours but <3.0.
 - D. ≥3.0 hours.
16. After reading this report, I am confident I can describe why HIV-prevention efforts in the United States should focus on HIV-infected persons.
- A. Strongly agree.
 - B. Agree.
 - C. Neither agree nor disagree.
 - D. Disagree.
 - E. Strongly disagree.

17. After reading this report, I am confident I can describe different means of screening HIV-infected patients for HIV transmission risk during routine office visits.
- A. Strongly agree.
 - B. Agree.
 - C. Neither agree nor disagree.
 - D. Disagree.
 - E. Strongly disagree.
18. After reading this report, I am confident I can describe behavioral interventions for HIV-infected persons to help prevent HIV transmission.
- A. Strongly agree.
 - B. Agree.
 - C. Neither agree nor disagree.
 - D. Disagree.
 - E. Strongly disagree.
19. After reading this report, I am confident I can identify reasons for referring HIV-infected persons for additional services.
- A. Strongly agree.
 - B. Agree.
 - C. Neither agree nor disagree.
 - D. Disagree.
 - E. Strongly disagree.
20. After reading this report, I am confident I can understand the importance of PCRS.
- A. Strongly agree.
 - B. Agree.
 - C. Neither agree nor disagree.
 - D. Disagree.
 - E. Strongly disagree.

(Continued on pg CE-4)

Detach or photocopy.

MMWR Response Form for Continuing Education Credit
July 18, 2003/Vol. 52/No. RR-12
Incorporating HIV Prevention into the Medical Care
Persons Living with HIV

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Signature _____ Date I Completed Exam _____

21. The objectives are relevant to the goal of this report.

- A. Strongly agree.
- B. Agree.
- C. Neither agree nor disagree.
- D. Disagree.
- E. Strongly disagree.

22. The teaching strategies used in this report (text, figures, boxes, and tables) were useful.

- A. Strongly agree.
- B. Agree.
- C. Neither agree nor disagree.
- D. Disagree.
- E. Strongly disagree.

23. Overall, the presentation of the report enhanced my ability to understand the material.

- A. Strongly agree.
- B. Agree.
- C. Neither agree nor disagree.
- D. Disagree.
- E. Strongly disagree.

24. These recommendations will affect my practice.

- A. Strongly agree.
- B. Agree.
- C. Neither agree nor disagree.
- D. Disagree.
- E. Strongly disagree.

25. The content of this activity was appropriate for my educational needs.

- A. Strongly agree.
- B. Agree.
- C. Neither agree nor disagree.
- D. Disagree.
- E. Strongly disagree.

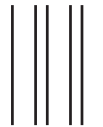
26. The availability of continuing education credit influenced my decision to read this report.

- A. Strongly agree.
- B. Agree.
- C. Neither agree nor disagree.
- D. Disagree.
- E. Strongly disagree.

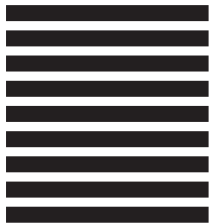
27. How did you learn about this continuing education activity?

- A. Internet.
- B. Advertisement (e.g., fact sheet, MMWR cover, newsletter, or journal).
- C. Coworker/supervisor.
- D. Conference presentation.
- E. MMWR subscription.
- F. Other.

Correct answers for questions 1-10.
1. D; 2. A; 3. D; 4. E; 5. D; 6. B; 7. B; 8. C; 9. D; 10. D.



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