CDC GUIDELINE FOR ISOLATION PRECAUTIONS IN HOSPITALS

Julia S. Garner, RN, MS
Bryan P. Simmons, MD

AND

CDC GUIDELINE FOR INFECTION CONTROL IN HOSPITAL PERSONNEL

Walter W. Williams, MD, MPH

Part of the Manual Entitled
Guidelines for Prevention and Control of Nosocomial Infections

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
Center for Infectious Diseases
Hospital Infections Program
Atlanta, Georgia 30333

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta, Georgia 30333

September 1983

TO: Hospital Infection Control Committees
State Epidemiologists
State Public Health Laboratory Directors

SUBJECT: Guideline for Isolation Precautions in Hospitals and
Guideline for Infection Control in Hospital Personnel

The Hospital Infections Program of the Center for Infectious Diseases is distributing under this cover the new CDC guidelines on hospital infection control. The two guidelines, "Guideline for Isolation Precautions in Hospitals" and "Guideline for Infection Control in Hospital Personnel," are the same guidelines that were published in a special supplement to the July/August 1983 issue of the journal Infection Control. In hospitals, the new guidelines and section dividers should be inserted in the blue notebook manual, Guidelines for the Prevention and Control of Nosocomial Infections, which CDC sent to each hospital in 1981. In health departments, the materials may be placed with other reference material from CDC.

CDC cannot fill requests for additional copies of these guidelines. The "Guideline for Isolation Precautions in Hospitals" and color-coded instruction cards will be available in 2-4 weeks for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; these supersede and replace the manual entitled "Isolation Techniques for Use in Hospitals, 2nd Edition 1975," and accompanying cards, which have been sold by the Superintendent of Documents since 1970.

The "Guideline for Infection Control in Hospital Personnel" and the "Guideline for Isolation Precautions in Hospitals" will be available in 4-6 weeks for purchase in single or multiple copies from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161. In addition to these two new guidelines, NTIS also sells the other guidelines in this series in looseleaf form, with or without the 3-ring binder with dividers to hold them.

Walter R. Dowdle, Ph.D.
Director
Center for Infectious Diseases

Preface to the Guidelines Series

The *Guidelines for the Prevention and Control of Nosocomial Infections* is a series of guidelines intended for use by hospital personnel who are responsible for infection surveillance and control activities. The guidelines have been derived from a variety of sources, including studies conducted by the Centers for Disease Control and by others and have undergone extensive review by experts, many of whom are engaged in the daily practice of infection surveillance and control. The guidelines are assembled in loose-leaf form to allow for periodic revisions and additions, since we fully expect the guidelines to change as new knowledge is acquired.

The titles of the various guidelines are listed below. Others may be added in the future. Within each guideline the date of original publication and subsequent revision, if any, appear at the bottom of each page. Additional copies of all guidelines are available from:

National Technical Information Service
U.S. Department of Commerce
Springfield, Viriginia 22161

Titles of Published Guidelines

Guideline for Prevention of Catheter-associated Urinary Tract Infections
Guideline for Hospital Environmental Control
Guideline for Prevention of Intravascular Infections
Guideline for Prevention of Surgical Wound Infections
Guideline for Prevention of Nosocomial Pneumonia
Guideline for Isolation Precautions in Hospitals
Guideline for Infection Control in Hospital Personnel

Proposed Guideline Topics

Guideline for Prevention of Infections during Total Parenteral Nutrition
Guideline for Surveillance of Nosocomial Infections
Guideline on the Role of the Microbiology Laboratory in Infection Control

All comments, suggestions, and criticisms of the guidelines

Guidelines Activity
Hospital Infections Program
Center for Infectious Disease
Centers for Disease Control
Atlanta, Georgia 30333

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Guideline for Isolation Precautions in Hospitals

Written by Julia S. Garner, RN, MN
Bryan P. Simmons, MD
Hospital Infections Program
Center for Infectious Diseases
Centers for Disease Control
Atlanta, Georgia

WORKING GROUP
Theodore C. Eickhoff, MD, Chairman
Professor of Medicine
University of Colorado School of Medicine
Director of Internal Medicine
Presbyterian/St. Luke's Medical Center
Denver, Colorado

James D. Cherry, MD
Professor of Pediatrics
Chief, Division of Pediatric Infectious Diseases
Center for the Health Sciences
UCLA School of Medicine
Los Angeles, California

William R. Cole, MD
Surgical Associates
Sedalia, Missouri

Richard E. Dixon, MD
Associate Professor of Medicine
Hahnemann University
Director, Department of Medicine
Helene Fuld Medical Center
Trenton, New Jersey

Mary Jane Freeburn, RN
Infection Control Nurse
Good Samaritan Hospital of Santa Clara Valley
San Jose, California

Rita D. McCormick, RN
Infection Control Nurse
University of Wisconsin Hospitals and Clinics
Madison, Wisconsin

John D. Nelson, MD
Professor of Pediatrics
University of Texas Health Science Center at Dallas
Dallas, Texas

Philip A. Pizzo, MD
Head, Infectious Diseases Section
Chief, Pediatric Branch
National Cancer Institute
National Institutes of Health
Bethesda, Maryland

William Schaffner, MD
Professor of Preventive Medicine and Medicine
Vanderbilt University School of Medicine
Nashville, Tennessee

*The Guidelines may be purchased from the
National Technical Information Service at this address:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
Telephone: (703) 487-4650

Contributors from the
Hospital Infections Program, Center for Infectious Diseases, Centers for Disease Control

Robert W. Haley, MD
Director

James R. Allen, MD
Former Chief
Epidemic Investigations Branch

T. Grace Emori, RN, MS
Nurse Epidemiologist
Surveillance and Prevention Branch

James M. Hughes, MD
Assistant Director for Medical Science

William J. Martone, MD
Chief
Epidemic Investigations Branch

Walter W. Williams, MD
Chief
Guidelines Activity

Other CDC Contributors

Mary Louise Atkinson, RN, MA
Assistant to the Director (retired)
Division of Tuberculosis Control
Center for Prevention Services

Laurence S. Farer, MD
Director
Division of Tuberculosis Control
Center for Prevention Services

Martin S. Favero, PhD
Assistant Director for Laboratory Science
Division of Hepatitis and Viral Enteritis
Center for Infectious Diseases

Frances H. Porcher, Chief
Gayle P. Lloyd, Writer-Editor
Publications and Graphics Activities
Center for Infectious Diseases

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Preface

The first Centers for Disease Control (CDC) recommendations for isolation appeared in the manual *Isolation Techniques for Use in Hospitals*, published in 1970. The second edition of the manual was published first in 1975 and with minor revisions in 1978. All have been reprinted many times. Because knowledge of the epidemiology of infectious diseases can change, isolation recommendations should be revised periodically. Furthermore, CDC recognizes the need to keep isolation recommendations current by including newly described syndromes, such as toxic shock syndrome and acquired immunodeficiency syndrome, and emerging pathogens, such as multiply-resistant microorganisms and *Legionella pneumophila*.

The 1983 CDC recommendations for isolation precautions have been developed as a guideline, similar to those recently published on other topics. The title of the isolation recommendations has been changed to include the word "guideline," and it will become part of the CDC series entitled *Guidelines for the Prevention and Control of Nosocomial Infections*. Adult and pediatric infectious disease specialists, hospital epidemiologists, infection control nurses, and a surgeon served in a working group to give CDC consultation by outside experts.

The isolation precautions presented in this guideline are considered to be a collection of prudent practices recommended by CDC personnel and a panel of outside experts. Some of the isolation recommendations are based on well-documented modes of transmission identified in epidemiologic studies. Other recommendations are based on a reasonable theoretical rationale, as evidenced by consensus of the working group members. Since there have been few studies to test the efficacy of isolation recommendations, members of the working group did not rank the recommendations by the degree to which they have been substantiated by scientific data or the strength of the working group's opinion on their effectiveness or practical value. The recommendations presented in this guideline may be modified as necessary for an individual hospital and are not meant to restrict hospitals from requiring additional precautions. The guideline will be revised as the need is recognized.

Section 1: Introduction

MAJOR CHANGES IN GUIDELINE FOR ISOLATION PRECAUTIONS IN HOSPITALS FROM PREVIOUS EDITIONS OF ISOLATION MANUAL

The Guideline for Isolation Precautions in Hospitals contains many important changes from previous editions of the manual *Isolation Techniques for Use in Hospitals*:

1. Rather than recommending only an isolation system based on categories of isolation, we have included an alternative system: disease-specific isolation precautions. For the first time, hospitals can choose *one* of these alternative systems for isolation—or they can, of course, design their own system. Some hospitals may prefer to continue using the more familiar, convenient, and simple category-specific isolation precautions. Disease-specific isolation precautions, however, may be more economical, in that only the particular precautions to interrupt transmission of the specific disease are recommended, so time and materials are not spent on unnecessary precautions. With disease-specific isolation precautions, we recommend using a single instruction card on which the need for specific precautions can be shown by checking appropriate items and filling in blanks. When isolation categories are used, we still recommend using standard color-coded category-specific instruction cards; however, the colors have been changed and the cards have been revised to correspond to changes made in the category-specific recommendations.
2. Major changes have been made in the titles of and specifications for categories of isolation and the diseases or conditions requiring specific categories of isolation.
   a. We have retained 3 categories of isolation (Strict Isolation, Respiratory Isolation, and Enteric Precautions) with modifications. We have substantially modified Enteric Precautions to minimize unnecessary use of gowns and gloves. This modification has permitted infections formerly under Excretion Precautions to be combined with those under Enteric Precautions. We have added and deleted diseases from Strict Isolation and Respiratory Isolation.
   b. We have created 4 new categories of isolation (for a total of 7 categories): Contact Isolation, Tuberculosis Isolation, Drainage/Secretion Precautions, and Blood/Body Fluid Precautions.
      1) Contact Isolation is intended for patients with highly transmissible or epidemiologically important infections that do not require Strict Isolation, for example, patients infected or colonized by multiply-resistant bacteria.
      2) Tuberculosis Isolation was created because of the unique precautions needed to interrupt tuberculosis transmission; pulmonary and laryngeal tuberculosis have been removed from the Respiratory Isolation category. It is called AFB Isolation (for acid-fast bacilli) on the instruction card to protect the patient's privacy.
      3) The category Drainage/Secretion Precautions was created by combining and modifying Wound and Skin Precautions, Discharge (lesion) Precautions, and Secretion (oral) Precautions found in previous editions.
      4) Blood/Body Fluid Precautions is intended both for patients with infective blood, as in malaria, and for patients with infective blood and body fluids, as in hepatitis B; the old category of Blood Precautions has been eliminated.
   c. We have eliminated the category Protective Isolation but discuss special infection problems related to compromised patients (see Care of Severely Compromised Patients).
3. We have identified the secretions, excretions, body fluids, and tissues that are or might be infective for each disease or condition that requires isolation precautions. Such identification will permit personnel to determine when to use gowns and gloves and how to handle used articles when taking care of patients on isolation precautions.
4. With some diseases or conditions, isolation precautions for infants and young children are different from those for other patients. For example, we recommend more stringent isolation precautions for infants and young children with acute respiratory infections than for adults because of the greater risk of spread and consequences of infection in infants and young children.
5. We have added a section on modifications of isolation precautions in intensive care units and in newborn and infant nurseries.
6. We have added a number of diseases and commonly used synonyms to the alphabetical listing of diseases or conditions that require isolation precautions to assist personnel in locating them more rapidly.
7. We have deleted the section describing the special precautions that are necessary for smallpox; we now recommend that the State Health Department and CDC be consulted about any suspected case of smallpox, Lassa fever, or other viral hemorrhagic fevers, such as Marburg virus disease, for advice about management of the patient and contacts.
8. We have deleted the section on recommendations for disinfection and sterilization of patient-care objects; we now refer the reader to the CDC Guideline for Hospital Environmental Control: Cleaning, Disinfection, and Sterilization of Hospital Equipment.

Nevertheless, the Guideline for Isolation Precautions in Hospitals, like the 2 previous editions of the isolation manual, is still intended primarily for acute-care hospitals, al-

though it may be applicable to some extended-care and other patient-care institutions. It is designed to establish a balance between isolation precautions that are ideal and those that are practical. Once again, it is designed to eliminate ritual and to establish effective precautions that isolate the disease and not the patients. Since gaps still exist in knowledge of the epidemiology of some diseases, we expect disagreement with some of our recommendations. Hospitals are encouraged to modify or supplement these recommendations to meet their own needs.

DECIDING WHICH SYSTEM OF ISOLATION PRECAUTIONS TO USE IN YOUR HOSPITAL

To use the new approaches introduced in this guideline most effectively, each hospital's infection control committee must thoroughly review the entire guideline and *MAKE A DECISION* regarding which of the alternative systems of isolation precautions to use.

The first step is for all members of the committee who will participate in this decision to review the entire guideline carefully. This is necessary because the Guideline for Isolation Precautions in Hospitals contains many changes in recommended procedures as well as format from the previous manual *Isolation Techniques for Use in Hospitals*. To facilitate this review, we have summarized the most important changes in the introduction to the guideline and have included the rationale for these changes in other sections of the document.

The second step is for the infection control committee to *MAKE A DECISION* as to whether their hospital will use System A, the Category-Specific System, or System B, the Disease-Specific System, both of which are thoroughly described in this guideline. Of course, in some hospitals the committee may decide instead to use the information and recommendations in this guideline to create their own system of isolation precautions. However, from a logistical point of view, *the committee should not try to combine different elements taken from both systems,* because mixing the 2 approaches may lead to confusion among hospital personnel who are expected to apply the isolation precautions in patient care. Personnel throughout the hospital who will be using isolation precautions should be trained to apply only the *system* that is officially adopted by the infection control committee.

In deciding between the 2 alternative systems, the committee members should consider the relative advantages and disadvantages of each approach. Most importantly, the category-specific system (System A) is a simpler system that requires patient-care personnel to learn only a few set routines for applying isolation precautions (corresponding to the 7 categories), but because many different diseases are grouped into a few categories, some unnecessary precautions will be applied to some diseases (some degree of over-isolation). Alternatively, the disease-specific system (System B) ensures that the isolation precautions applied are only ones required to interrupt transmission of the infection; since the set of precautions is individualized to each disease, this system requires more training and a much higher level of attention on the part of patient-care personnel for it to be applied correctly in all cases. Use of this system, however, should result in less over-isolation.

In the process of customizing the isolation procedures, some hospitals may need to revise their current practices only slightly, whereas others may choose to adopt an entirely new approach (eg, switching from the traditional category-specific system to the new disease-specific system). Major changes in isolation precautions will affect nursing personnel in particular, and factors such as whether primary nursing or team nursing is used in the hospital may influence the decision to change. The personnel who are in the best position to project benefits and anticipate problems stemming from revising isolation policies and procedures are those involved in infection control, particularly those involved in regular ward rounds and ongoing consultation with patient-care personnel about isolation precautions; therefore, they are probably in the best position to advise the infection control committee and other policymakers about the feasibility of proposed changes.

If the committee *HAS DECIDED* to use System A or System B in the hospital, the third step is to prepare a hospital isolation guide or manual which could simply incorporate the specific parts of this guideline that pertain to the particular approach adopted. If System A, the Category-Specific System, has been adopted, they should construct a manual containing introductory material from Section 1, Section 2 (pages 7-8), part of Section 3 (pages 9-46), and Section 4 (pages 80-81) of this guideline. Alternatively, if System B, the Disease-Specific System has been adopted, they should construct a manual containing introductory material from Section 1, Section 2 (pages 7-8), part of Section 3 (pages 9-13 and 47-79), and Section 4 (pages 80-81) of this guideline. Since this guideline is in the public domain, and thus not subject to the copyright laws, these sections may be duplicated for use as needed by hospitals or produced by commercial vendors.

The fourth step is to distribute the system-specific isolation guide to the hospital's patient-care personnel. One copy should be put in a convenient place in every nursing station, and relevant parts of the guide should simultaneously be incorporated into the standing procedure manuals of the Nursing Service and other applicable hospital departments.

The fifth step is to put the new system into action and keep it running as smoothly as possible. This requires planning and delivering effective in-service training to those who will apply the system, monitoring performance to assure compliance and detect problems, and making adjustments as necessary.

By following these 5 decision-making and implementation steps, the hospital can produce a management system for applying isolation precautions based on the latest recommendations, yet customized most appropriately to its own unique needs.

Section 2: Rationale and Responsibilities for Isolation Precautions

RATIONALE FOR ISOLATION PRECAUTIONS

Spread of infection within a hospital requires 3 elements: a source of infecting organisms, a susceptible host, and a means of transmission for the organism.

Source

The source of the infecting agent may be patients, personnel, or on occasion, visitors, and may include persons with acute disease, persons in the incubation period of the disease, or persons who are colonized by the infectious agent but have no apparent disease. Another source of infection can be the person's own endogenous flora (autogenous infection). Other potential sources are inanimate objects in the environment that have become contaminated, including equipment and medications.

Host

Patients' resistance to pathogenic microorganisms varies greatly. Some persons may be immune to or able to resist colonization by an infectious agent; others exposed to the same agent may establish a commensal relationship with the infecting organism and become asymptomatic carriers; still others may develop clinical disease. Persons with diabetes mellitus, lymphoma, leukemia, neoplasia, granulocytopenia, or uremia and those treated with certain antimicrobials, corticosteroids, irradiation, or immunosuppressive agents may be particularly prone to infection. Age, chronic debilitating disease, shock, coma, traumatic injury, or surgical procedures also make a person more susceptible.

Transmission

Microorganisms are transmitted by various routes, and the same microorganism may be transmitted by more than 1 route. For example, varicella-zoster virus can spread either by the airborne route (droplet nuclei) or by direct contact. The differences in infectivity and in the mode of transmission of the various agents form the basis for the differences in isolation precautions that are recommended in this guideline.

There are 4 main routes of transmission—contact, vehicle, airborne, and vectorborne.

A. Contact transmission, the most important and frequent means of transmission of nosocomial infections, can be divided into 3 subgroups: direct contact, indirect contact, and droplet contact.
   1. Direct contact—This involves direct physical transfer between a susceptible host and an infected or colonized person, such as occurs when hospital personnel turn patients, give baths, change dressings, or perform other procedures requiring direct personal contact. Direct contact can also occur between 2 patients, 1 serving as the source of infection and the other as a susceptible host.
   2. Indirect contact—This involves personal contact of the susceptible host with a contaminated intermediate object, usually inanimate, such as bed linens, clothing, instruments, and dressings.
   3. Droplet contact—Infectious agents may come in contact with the conjunctivae, nose, or mouth of a susceptible person as a result of coughing, sneezing, or talking by an infected person who has clinical disease or is a carrier of the organism. This is considered "contact" transmission rather than airborne since droplets usually travel no more than about 3 feet.

B. The vehicle route applies in diseases transmitted through these contaminated items:
   1. food, such as in salmonellosis
   2. water, such as in legionellosis
   3. drugs, such as in bacteremia resulting from infusion of a contaminated infusion product
   4. blood, such as in hepatitis B, or non-A, non-B hepatitis.

C. Airborne transmission occurs by dissemination of either droplet nuclei (residue of evaporated droplets that may remain suspended in the air for long periods of time) or dust particles in the air containing the infectious agent. Organisms carried in this manner can be widely dispersed by air currents before being inhaled by or deposited on the susceptible host.

D. Vectorborne transmission is of greater concern in tropical countries, for example, with mosquito-transmitted malaria. It is of little significance in hospitals in the United States.

Isolation precautions are designed to prevent the spread of microorganisms among patients, personnel, and visitors. Since agent and host factors are more difficult to control, interruption of the chain of infection in the hospital is directed primarily at transmission. The isolation precautions recommended in this guideline are based on this concept.

Nevertheless, placing a patient on isolation precautions often presents certain disadvantages to both the hospital and the patient. Some isolation precautions may be time-consuming and add to the cost of hospitalization. They may make frequent visits by physicians, nurses, and other personnel inconvenient, and they may make it difficult for hospital personnel to give the prompt and frequent care that is sometimes required. The occasional recommendation of a private room under some circumstances uses valuable space that might otherwise accommodate several patients. Moreover, forced solitude deprives the patient of normal social relationships and may be psychologically injurious, especially for children. In an attempt to balance the disadvan-

tages of placing a patient on isolation precautions against the various hazards posed by transmissible infections, we have tried to design "degrees of isolation."

In general, it is safer to "over-isolate" than to "under-isolate," particularly when the diagnosis is uncertain and several diseases are seriously being considered. For the patient who appears to have a disease requiring isolation precautions, it is important to institute appropriate isolation precautions immediately rather than wait for confirmation of the diagnosis. Furthermore, certain general precautions may be required even though the patient does not fully meet the criteria for specific isolation precautions. For example, patients with bacteriuria and indwelling urinary catheters are known to serve as reservoirs of infection for roommates who also have indwelling urinary catheters. Passive carriage on the hands of personnel who provide urinary catheter care transmits these infections. Thus, noninfected patients with catheters should not, *where practical,* share rooms with catheterized patients who have bacteriuria.

Isolation precautions also may have to be modified for a patient who needs constant care or whose clinical condition may require emergency intervention such as those in intensive care units or nurseries. When such modifications are made, it is essential that the risk to other patients or hospital personnel of acquiring nosocomial infection be minimized.

RESPONSIBILITIES FOR CARRYING OUT ISOLATION PRECAUTIONS

The hospital is responsible for ensuring that patients are placed on appropriate isolation precautions. Each hospital should designate clearly, as a matter of policy, the personnel responsible for placing a patient on isolation precautions and the personnel who have the ultimate authority to make decisions regarding isolation precautions when conflicts arise.

All personnel—physicians, nurses, technicians, students, and others—are responsible for complying with isolation precautions and for tactfully calling observed infractions to the attention of offenders. Physicians should observe the proper isolation precautions at all times; they must teach by example. The responsibilities of hospital personnel for carrying out isolation precautions cannot be effectively dictated but must arise from a personal sense of responsibility.

Patients also have a responsibility for complying with isolation precautions. The appropriate measures should be explained to the patient by physicians and nurses. An important general patient responsibility is handwashing after touching infective material and potentially contaminated articles.

Infractions of the isolation protocol by some are sufficient to negate the conscientious efforts of others. The maxim holds true: "The chain is no stronger than its weakest link."

Section 3: Techniques and Recommendations for Isolation Precautions

TECHNIQUES FOR ISOLATION PRECAUTIONS

This section contains information essential to understanding and properly using the isolation precautions that appear in the guideline and on the instruction cards. Many of the techniques and recommendations for isolation precautions are appropriate not only for patients known or suspected to be infected but also for routine patient care. For example, gowns are appropriate for patient-care personnel when soiling with feces is likely, whether or not the patient is known or suspected to be infected with an enteric pathogen, and caution should be used when handling any used needle.

Handwashing

Handwashing is the single most important means of preventing the spread of infection. Personnel should always wash their hands, even when gloves are used, after taking care of an infected patient or one who is colonized with microorganisms of special clinical or epidemiologic significance, for example, multiply-resistant bacteria. In addition, personnel should wash their hands after touching excretions (feces, urine, or material soiled with them) or secretions (from wounds, skin infections, etc.) before touching any patient again. Hands should also be washed before performing invasive procedures, touching wounds, or touching patients who are particularly susceptible to infection. Hands should be washed between all patient contacts in intensive care units and newborn nurseries. (See Guideline for Hospital Environmental Control: Antiseptics, Handwashing, and Handwashing Facilities.)

When taking care of patients infected (or colonized) with virulent or epidemiologically important microorganisms, personnel should consider using antiseptics for handwashing rather than soap and water, especially in intensive care units. Antiseptics will inhibit or kill many microorganisms that may not be completely removed by normal handwashing; antiseptics that have a residual effect will continue to suppress microbial growth well after handwashing. Such antiseptics should not be used as a substitute for adequate handwashing, however.

Private Room

In general, a private room can reduce the possibility of transmission of infectious agents in 2 ways. First, it separates infected or colonized patients from susceptible patients and thus lessens the chance for transmission by any route. Second, it may act as a reminder for personnel to wash their hands before leaving the room and contacting other patients, especially if a sink is available at the doorway. Nevertheless, a private room is not necessary to prevent the spread of many infections.

A private room is indicated for patients with infections that are highly infectious or are caused by microorganisms that are likely to be virulent when transmitted. A private room is also indicated if patient hygiene is poor, for example, if a patient does not wash hands after touching infective material (feces and purulent drainage or secretions), contaminates the environment, or shares contaminated articles. Such patients may include infants, children, and patients who have altered mental status. A private room may also be indicated for patients colonized with microorganisms of special clinical or epidemiologic significance, for example, multiply-resistant bacteria. Finally, a private room may be indicated for patients whose blood is infective, for example, hepatitis B, if profuse bleeding is likely to cause environmental contamination.

In addition to handwashing facilities, a private room should contain bathing and toilet facilities if the room is used for patients requiring isolation precautions. Toilet facilities obviate the need for portable commodes or special precautions for transporting commodes, bedpans, and urinals. An anteroom between the room and the hall, especially for rooms housing patients with highly infectious diseases spread by airborne transmission, will help maintain isolation precautions by reducing the possibility of airborne spread of infectious agents from the room into the corridor whenever the door of the room is opened. Anterooms also provide storage space for supplies, such as gowns, gloves, and masks.

For a few infections, a private room with special ventilation is indicated. We define special ventilation as that which results in negative air pressure in the room in relation to the anteroom or hall, when the room door is closed. The ventilation air, which should generally result in 6 air changes per hour, preferably should be discharged outdoors away from intake vents or receive high efficiency filtration before being recirculated to other rooms.

Roommates for Patients on Isolation Precautions

If infected or colonized patients are not placed in private rooms, they should be placed with appropriate roommates. Generally, infected patients should not share a room with a patient who is likely to become infected or in whom consequences of infection are likely to be severe.

When an infected patient shares a room with noninfected patients, it is assumed that patients and personnel will take measures to prevent the spread of infection. For example, a patient whose fecal material is infective may be in a room with others as long as he or she is cooperative, washes hands carefully, and does not have such severe diarrhea or fecal incontinence that either roommates or objects used by them become contaminated. Likewise, personnel need to wear gloves and wash hands when indicated and ensure that contaminated articles are discarded or returned for decontamination and reprocessing. When these conditions cannot be met, a private room is advisable.

In general, patients infected by the same microorganism may share a room. Also, infants and young children with the same respiratory clinical syndrome, for example, croup, may share a room. Such grouping (or cohorting) of patients

is especially useful during outbreaks when there is a shortage of private rooms.

Masks

In general, masks are recommended to prevent transmission of infectious agents through the air. Masks protect the wearer from inhaling 1) large-particle aerosols (droplets) that are transmitted by close contact and generally travel only short distances (about 3 feet) and 2) small-particle aerosols (droplet nuclei) that remain suspended in the air and thus travel longer distances. Masks might also prevent transmission of some infections that are spread by direct contact with mucous membranes, because masks may discourage personnel from touching the mucous membranes of their eyes, nose, and mouth until after they have washed their hands and removed the mask. The high efficiency disposable masks are more effective than cotton gauze or paper tissue masks in preventing airborne and droplet spread.

If the infection is transmitted by large-particle aerosols (droplets), we recommend masks only for those close to the patient. If the infection is transmitted over longer distances by air, we recommend masks for all persons entering the room. When masks are indicated, they should be used only once (because masks become ineffective when moist) and discarded in an appropriate receptacle; masks should not be lowered around the neck and reused. All masks should cover both the nose and the mouth.

Gowns

In general, gowns are recommended to prevent soiling of clothing when taking care of patients. Gowns are not necessary for most patient care because such soiling is not likely. However, gowns are indicated when taking care of patients on isolation precautions if clothes are likely to be soiled with infective secretions or excretions, for example, when changing the bed of an incontinent patient who has infectious diarrhea or when holding an infant who has a respiratory infection. Furthermore, gowns are indicated, even when gross soiling is not anticipated, for all persons entering the room of patients who have infections that if transmitted in hospitals frequently cause serious illness, for example, varicella (chickenpox) or disseminated zoster. When gowns are indicated, they should be worn only once and then discarded in an appropriate receptacle. Clean, freshly laundered or disposable gowns may be worn in most circumstances. In some instances, as with extensive burns or extensive wounds, sterile gowns may be worn when changing dressings.

Gloves

In general, there are 3 distinct reasons for wearing gloves. First, gloves reduce the possibility that personnel will become infected with microorganisms that are infecting patients; for example, gloves should prevent personnel from developing herpetic whitlow after giving oral care or suctioning a patient with oral herpes simplex infections. Second, gloves reduce the likelihood that personnel will transmit their own endogenous microbial flora to patients; for example, sterile gloves are used for this reason when personnel perform operations or touch open surgical wounds. Third, gloves reduce the possibility that personnel will become transiently colonized with microorganisms that can be transmitted to other patients. Under most conditions, such transient colonization can be eliminated by handwashing. Thus, in hospitals where handwashing is performed carefully and appropriately by all personnel, gloves are theoretically not necessary to prevent transient colonization of personnel and subsequent transmission by them to others. However, since handwashing practices are thought to be inadequate in most hospitals, gloves appear to be a practical means of preventing transient hand colonization and spread of some infections. Therefore, for many diseases or conditions listed in this guideline, wearing gloves is indicated for touching the excretions, secretions, blood, or body fluids that are listed as infective material. Gloves may not be needed if "no touch" technique (not touching infective materials with hands) can be used.

When gloves are indicated, disposable single-use gloves (sterile or nonsterile, depending on the purpose for use) should be worn. Used gloves should be discarded into an appropriate receptacle. After direct contact with a patient's excretions or secretions, when taking care of that patient, gloves should be changed if care of that patient has not been completed.

Bagging of Articles

Used articles may need to be enclosed in an impervious bag before they are removed from the room or cubicle of a patient on isolation precautions. Such bagging is intended to prevent inadvertent exposures of personnel to articles contaminated with infective material and prevent contamination of the environment. Most articles do not need to be bagged unless they are contaminated (or likely to be contaminated) with infective material. (See the Tables, which contain an alphabetical listing of diseases, for identification of the infective material for each disease.) A single bag is probably adequate if the bag is impervious and sturdy (not easily penetrated) and if the article can be placed in the bag without contaminating the outside of the bag; otherwise, double bagging should be used. Bags should be labeled or be a particular color designated solely for contaminated articles or infectious wastes.

Disposable Patient-care Equipment

A variety of disposable patient-care equipment is available and should be considered for patients on isolation precautions. Use of these disposable articles reduces the possibility that equipment will serve as a fomite, but they must be disposed of safely and adequately. Equipment that is contaminated (or likely to be contaminated) with infective material should be bagged, labeled, and disposed of in accordance with the hospital's policy for disposal of infectious wastes. Local regulations may call for incineration or disposal in an authorized sanitary landfill without the bag's being opened. No special precautions are indicated for disposable patient-care equipment that is not contaminated (or likely to be contaminated) with infective material. (See Guideline for Hospital Environmental Control: Housekeeping Services and Waste Disposal.)

Reusable Patient-care Equipment

Ideally, such equipment should be returned to a central processing area for decontamination and reprocessing by trained personnel. When contaminated with infective material, equipment should be bagged and labeled before being removed from the patient's room or cubicle and remain bagged until decontaminated or sterilized. Special procedure trays should be separated into component parts and handled ap-

propriately (some components can be discarded; others may need to be sent to the laundry or central services for reprocessing). (See Guideline for Hospital Environmental Control: Cleaning, Disinfection, and Sterilization of Hospital Equipment.)

Needles and Syringes

In general, personnel should use caution when handling all used needles and syringes because it is usually not known which patient's blood is contaminated with hepatitis virus or other microorganisms. To prevent needle-stick injuries, used needles should not be recapped; they should be placed in a prominently labeled, puncture-resistant container designated specifically for this purpose. Needles should not be purposely bent or broken by hand, because accidental needle puncture may occur. When some needle-cutting devices are used, blood may spatter onto environmental surfaces; however, currently no data are available from controlled studies examining the effect, if any, of these devices on the incidence of needle-transmissible infections. If the patient's blood is infective, disposable syringes and needles are preferred. If reusable syringes are used, they should be bagged and returned for decontamination and reprocessing. (See Guideline for Hospital Environmental Control: Cleaning, Disinfection, and Sterilization of Hospital Equipment.)

Sphygmomanometer and Stethoscope

No special precautions are indicated unless this equipment is contaminated (or likely to be contaminated) with infective material. If contaminated, the equipment should be disinfected in the manner appropriate to the object and to the etiologic agent that necessitated isolation precautions. (See Guideline for Hospital Environmental Control: Cleaning, Disinfection, and Sterilization of Hospital Equipment.)

Thermometers

Thermometers from patients on isolation precautions should be sterilized or receive high-level disinfection before being used by another patient. (See Guideline for Hospital Environmental Control: Cleaning, Disinfection, and Sterilization of Hospital Equipment.)

Linen

In general, soiled linen should be handled as little as possible and with a minimum of agitation to prevent gross microbial contamination of the air and of persons handling the linen. Soiled linen from patients on isolation precautions should be put in a laundry bag in the patient's room or cubicle. The bag should be labeled or be a particular color (for example, red) specifically designated for such linen so that whoever receives the linen knows to take the necessary precautions. Linens will require less handling if the bag is hot-water-soluble because such bags can be placed directly into the washing machine; however, a hot-water soluble bag may need to be double-bagged because they are generally easily punctured or torn or may dissolve when wet. Linen from patients on isolation precautions should not be sorted before being laundered. If mattresses and pillows are covered with impervious plastic, they can be cleaned by wiping with a disinfectant-detergent. (See Guideline for Hospital Environmental Control: Laundry Services.)

Dishes

No special precautions are necesary for dishes unless they are visibly contaminated with infective material, for example, with blood, drainage, or secretions. Disposable dishes contaminated with infective material can be handled as disposable patient-care equipment. Reusable dishes, utensils, and trays contaminated with infective material should be bagged and labeled before being returned to the food service department. Food service personnel who handle these dishes should wear gloves, and they should wash their hands before handling clean dishes or food.

Drinking Water

No special precautions are indicated for drinking water. Containers used to hold water for patients on isolation precautions and glasses should be handled as dishes.

Dressings and Tissues

All dressings, paper tissues, and other disposable items soiled with infective material (respiratory, oral, or wound secretions) should be bagged and labeled and disposed of in accordance with the hospital's policy for disposal of infectious wastes. Local regulations may call for incineration or disposal in an authorized sanitary landfill without being opened. (See Guideline for Hospital Environmental Control: Housekeeping Services and Waste Disposal.)

Urine and Feces

Urine and feces from patients on isolation precautions can be flushed down the toilet if the hospital uses a municipal or other safe sewage treatment system. A urinal or bedpan from a patient on isolation precautions should be cleaned and disinfected or sterilized before being used by another patient. (See Guideline for Hospital Environmental Control: Cleaning, Disinfection, and Sterilization of Hospital Equipment.)

Laboratory Specimens

In general, each specimen should be put in a well-constructed container with a secure lid to prevent leaking during transport. Care should be taken when collecting specimens to avoid contamination of the outside of the container. If the outside of the container is visibly contaminated, it should be cleaned or disinfected or be placed in an impervious bag. Specimens from patients on isolation precautions may need to be placed in an impervious bag and labeled before being removed from the room or cubicle; bagging is intended to prevent inadvertent exposures of laboratory or transport personnel to infective material and prevent contamination of the environment. Whether specimens from patients on isolation precautions need to be bagged before being sent to the laboratory will depend on the kind of specimen and container, the procedures for collecting specimens, and the methods for transporting and receiving specimens in the hospital laboratory.

Patient's Chart

The chart should not be allowed to come into contact with infective material or objects that may be contaminated with infective material.

Visitors

Visitors should talk with a nurse before entering the room or cubicle of a patient on isolation precautions and, if indicated, should be instructed in the appropriate use of gown, mask, gloves, or other special precautions.

Transporting Infected or Colonized Patients

Patients infected with virulent or epidemiologically important microorganisms should leave their room only for essential purposes. Appropriate barriers (masks, impervious dressings, etc.) to prevent transmission should be used by

the patient and transport personnel. Personnel in the area to which the patient is to be taken should be notified of the impending arrival of the patient and of precautions to be used to prevent transmission of infection. Patients should be alerted to the potential spread of their disease and informed as to how they can assist in maintaining a barrier against transmission of their infection to others.

Clothing

Clothing soiled with infective material should be bagged before being sent home or to the hospital laundry; it should be washed with a detergent and, if possible, hot water and bleach.

Books, Magazines, and Toys

In general, any of these articlers visibly soiled with infective material should be disinfected or destroyed. A child with an infection that may be spread by fomites or by contact transmission should not share toys with other children.

Routine Cleaning

The same routine daily cleaning procedures used in other hospital rooms should be used to clean rooms or cubicles of patients on isolation precautions. Cleaning equipment used in rooms of patients whose infection requires a private room should be disinfected before being used in other patient rooms. For example, dirty water should be discarded, wiping cloths and mop heads should be laundered and thoroughly dried, and buckets should be disinfected before being refilled. If cleaning cloths and mop heads are contaminated with infective material or blood, they should be bagged and labeled before being sent to the laundry. (See Guideline for Hospital Environmental Control: Housekeeping Services and Waste Disposal.)

Terminal Cleaning

When isolation precautions have been discontinued, the remaining infection control responsibilities relate to the inanimate environment. Therefore, certain epidemiologic aspects of environmental transmission should be kept in mind by personnel involved with terminal cleaning (cleaning after the patient has been taken off isolation precautions or has ceased to be a source of infection). Although microorganisms may be present on walls, floors, and table tops in rooms used for patients on isolation precautions, these environmental surfaces, unless visibly contaminated, are rarely associated with transmission of infections to others. In contrast, microorganisms on contaminated patient-care equipment are frequently associated with transmission of infections to other patients when such equipment is not appropriately decontaminated and reprocessed. Therefore, terminal cleaning should primarily be directed toward those items that have been in direct contact with the patient or in contact with the patient's infective material (excretions, secretions, blood, or body fluids). Disinfectant-detergent solution used during terminal cleaning should be freshly prepared. Terminal cleaning of rooms (or cubicles) consists of the following:

a. Generally, housekeeping personnel should use the same precautions to protect themselves during terminal cleaning that they would use if the patient were still in the room; however, masks are not needed if they had been indicated previously only for direct or close patient contact.
b. All nondisposable receptacles (drainage bottles, urinals, bedpans, flowmeter jars, thermometer holders, etc.) should be returned for decontamination and reprocessing. Articles that are contaminated (or likely to be contaminated) with infective material should be bagged and labeled before being sent for decontamination and reprocessing.
c. All disposable items should be discarded. Articles that are contaminated (or likely to be contaminated) with infective material should be bagged, labeled, and disposed of in accordance with the hospital's policy on disposal of infectious wastes. Local regulations may call for the bag's incineration or disposal in an authorized sanitary landfill without being opened. No special precautions are indicated for disposal of items that are not contaminated (or not likely to be contaminated) with infective material.
d. All equipment that is not sent to central services or discarded should be cleaned with a disinfectant-detergent solution.
e. All horizontal surfaces of furniture and mattress covers should be cleaned with a disinfectant-detergent solution.
f. All floors should be wet-vacuumed or mopped with a disinfectant-detergent solution. (For recommendations on carpets, see Guideline for Hospital Environmental Control: Housekeeping Services and Waste Disposal.)
g. Routine washing of walls, blinds, and curtains is not indicated; however, these should be washed if they are visibly soiled. Cubicle curtains should be changed if visibly soiled.
h. Disinfectant fogging is an unsatisfactory method of decontaminating air and surfaces and thus should not be used.
i. Airing a room from which a patient has been discharged is not an effective terminal disinfection procedure and is not necessary.
j. The State Health Department and the Centers for Disease Control, Hospital Infections Program, should be consulted about cleaning the room of a patient who has suspected smallpox, Lassa fever, Ebola fever, or other hemorrhagic fevers, such as Marburg disease.

Postmortem Handling of Bodies

Generally, personnel should use the same precautions to protect themselves during postmortem handling of bodies that they would use if the patient were still alive; however, masks are usually not necessary unless aerosols are expected to be generated. Autopsy personnel should be notified about the patient's disease status so that appropriate precautions can be maintained during and after autopsy. State or local regulations may call for additional special precautions for postmortem handling of bodies.

Miscellaneous

a. Isolation carts—Some institutions use pre-stocked isolation carts that contain equipment and supplies for isolation precautions. These can be wheeled to the general area where needed but should be placed in a clean area. Carts should be kept adequately stocked with all necessary supplies.
b. Admission—If a susceptible person has been exposed recently to an infectious disease requiring isolation

precautions, the physician should postpone elective admission or prescribe appropriate isolation precautions for a nonelective admission. This situation is most likely to occur with children or young adults.

c. Prophylaxis and immunization—When used appropriately, prophylactic antimicrobials and active or passive immunization may prevent or ameliorate the course of infections to which patients or personnel have been exposed. These measures should be considered as adjuncts to isolation precautions in preventing the spread of disease (see Guideline for Infection Control in Hospital Personnel).

Alternative Systems for Isolation Precautions

SYSTEM A. CATEGORY-SPECIFIC ISOLATION PRECAUTIONS

Category-specific isolation precautions is 1 of 2 isolation systems recommended by CDC. This system was the only one recommended in the first 2 editions of the CDC manual, *Isolation Techniques for Use in Hospitals*. Isolation categories are derived by grouping diseases for which similar isolation precautions are indicated. For diseases to be grouped into isolation categories, more isolation precautions must be required with some diseases than just those that are necessary to prevent transmission of those diseases. (Hospitals wishing to avoid overuse of isolation precautions may use the alternative isolation system, disease-specific isolation precautions.) Nevertheless, category-specific isolation precautions have advantages in that they are easier to administer and to teach personnel.

Seven isolation categories are used: Strict Isolation, Contact Isolation, Respiratory Isolation, Tuberculosis (AFB) Isolation, Enteric Precautions, Drainage/Secretion Precautions, and Blood/Body Fluid Precautions. The specifications for each category and the diseases and conditions included in the category are discussed below. (Additional information essential to understanding and properly using category-specific isolation precautions is contained in the preceding section, Techniques for Isolation Precautions, and in Table A, Category-Specific Isolation Precautions.)

Strict Isolation

Strict Isolation is an isolation category designed to prevent transmission of highly contagious or virulent infections that may be spread by both air and contact.

Specifications for Strict Isolation

1. Private room is indicated; door should be kept closed. In general, patients infected with the same organism may share a room.
2. Masks are indicated for all persons entering the room.
3. Gowns are indicated for all persons entering the room.
4. Gloves are indicated for all persons entering the room.
5. Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.
6. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

Diseases Requiring Strict Isolation

Diphtheria, pharyngeal
Lassa fever and other viral hemorrhagic fevers, such as Marburg virus disease*
Plague, pneumonic
Smallpox*
Varicella (chickenpox)
Zoster, localized in immunocompromised patient or disseminated

Contact Isolation

Contact Isolation is designed to prevent transmission of highly transmissible or epidemiologically important infections (or colonization) that do not warrant Strict Isolation. All diseases or conditions included in this category are spread primarily by close or direct contact. Thus, masks, gowns, and gloves are recommended for anyone in close or direct contact with any patient who has an infection (or colonization) that is included in this category. For individual diseases or conditions, however, 1 or more of these 3 barriers may not be indicated. For example, masks and gloves are not generally indicated for care of infants and young children with acute viral respiratory infections, gowns are not generally indicated for gonococcal conjunctivitis in newborns, and masks are not generally indicated for care of patients infected with multiply-resistant microorganisms, except those with pneumonia. Therefore, some degree of "over-isolation" may occur in this category.

Specifications for Contact Isolation

1. Private room is indicated. In general, patients infected with the same organism may share a room. During outbreaks, infants and young children with the same respiratory clinical syndrome may share a room.
2. Masks are indicated for those who come close to the patient.
3. Gowns are indicated if soiling is likely.
4. Gloves are indicated for touching infective material.
5. Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.
6. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

Diseases or Conditions Requiring Contact Isolation

Acute respiratory infections in infants and young children, including croup, colds, bronchitis, and bronchiolitis caused by respiratory syncytial virus, adenovirus, coronavirus, influenza viruses, parainfluenza viruses, and rhinovirus
Conjunctivitis, gonococcal, in newborns
Diphtheria, cutaneous
Endometritis, group A *Streptococcus*
Furunculosis, staphylococcal, in newborns
Herpes simplex, disseminated, severe primary or neonatal
Impetigo
Influenza, in infants and young children
Multiply-resistant bacteria, infection or colonization (any site) with any of the following:

1. Gram-negative bacilli resistant to all aminoglycosides that are tested. (In general, such organisms should be resistant to gentamicin, tobramycin, and amikacin for these special precautions to be indicated.)
2. *Staphylococcus aureus* resistant to methicillin (or nafcillin or oxacillin if they are used instead of methicillin for testing)
3. *Pneumococcus* resistant to penicillin
4. *Haemophilus influenzae* resistant to ampicillin (beta-lactamase positive) and chloramphenicol
5. Other resistant bacteria may be included if they are judged by the infection control team to be of special clinical and epidemiologic significance.

Pediculosis

*A private room with special ventilation is indicated.

Pharyngitis, infectious, in infants and young children
Pneumonia, viral, in infants and young children
Pneumonia, *Staphylococcus aureus* or group A *Streptococcus*
Rabies
Rubella, congenital and other
Scabies
Scalded skin syndrome, staphylococcal (Ritter's disease)
Skin, wound, or burn infection, major (draining and not covered by dressing or dressing does not adequately contain the purulent material) including those infected with *Staphylococcus aureus* or group A *Streptococcus*
Vaccinia (generalized and progressive eczema vaccinatum)

Respiratory Isolation

Respiratory Isolation is designed to prevent transmission of infectious diseases primarily over short distances through the air (droplet transmission). Direct and indirect contact transmission occurs with some infections in this isolation category but is infrequent.

Specifications for Respiratory Isolation

1. Private room is indicated. In general, patients infected with the same organism may share a room.
2. Masks are indicated for those who come close to the patient.
3. Gowns are not indicated.
4. Gloves are not indicated.
5. Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.
6. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

Diseases Requiring Respiratory Isolation

Epiglottitis, *Haemophilus influenzae*
Erythema infectiosum
Measles
Meningitis
Haemophilus influenzae, known or suspected
Meningococcal, known or suspected
Meningococcal pneumonia
Meningococcemia
Mumps
Pertussis (whooping cough)
Pneumonia, *Haemophilus influenzae*, in children (any age)

Tuberculosis Isolation (AFB Isolation)

Tuberculosis Isolation (AFB Isolation) is an isolation category for patients with pulmonary TB who have a positive sputum smear or a chest X-ray that strongly suggests current (active) TB. Laryngeal TB is also included in this isolation category. In general, infants and young children with pulmonary TB do not require isolation precautions because they rarely cough, and their bronchial secretions contain few AFB, compared with adults with pulmonary TB. On the instruction card, this category is called AFB (for acid-fast bacilli) Isolation to protect the patient's privacy.

Specifications for Tuberculosis Isolation (AFB Isolation)

1. Private room with special ventilation is indicated; door should be kept closed. In general, patients infected with the same organism may share a room.
2. Masks are indicated only if the patient is coughing and does not reliably cover mouth.
3. Gowns are indicated only if needed to prevent gross contamination of clothing.
4. Gloves are not indicated.
5. Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.
6. Articles are rarely involved in transmission of TB. However, articles should be thoroughly cleaned and disinfected, or discarded.

Enteric Precautions

Enteric Precautions are designed to prevent infections that are transmitted by direct or indirect contact with feces. Hepatitis A is included in this category because it is spread through feces, although the disease is much less likely to be transmitted after the onset of jaundice. Most infections in this category primarily cause gastrointestinal symptoms, but some do not. For example, feces from patients infected with "poliovirus" and coxsackieviruses are infective, but these infections do not usually cause prominent gastrointestinal symptoms.

Specifications for Enteric Precautions

1. Private room is indicated if patient hygiene is poor. A patient with poor hygiene does not wash hands after touching infective material, contaminates the environment with infective material, or shares contaminated articles with other patients. In general, patients infected with the same organism may share a room.
2. Masks are not indicated.
3. Gowns are indicated if soiling is likely.
4. Gloves are indicated if touching infective material.
5. Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.
6. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

Diseases Requiring Enteric Precautions

Amebic dysentery
Cholera
Coxsackievirus disease
Diarrhea, acute illness with suspected infectious etiology
Echovirus disease
Encephalitis (unless known not to be caused by enteroviruses)
Enterocolitis caused by *Clostridium difficile* or *Staphylococcus aureus*
Enteroviral infection
Gastroenteritis caused by
Campylobacter species
Cryptosporidium species
Dientamoeba fragilis
Escherichia coli (enterotoxic, enteropathogenic, or enteroinvasive)
Giardia lamblia
Salmonella species
Shigella species
Vibrio parahaemolyticus
Viruses—including Norwalk agent and rotavirus
Yersinia enterocolitica
Unknown etiology but presumed to be an infectious agent

Hand, foot, and mouth disease
Hepatitis, viral, type A
Herpangina
Meningitis, viral (unless known not to be caused by enteroviruses)
Necrotizing enterocolitis
Pleurodynia
Poliomyelitis
Typhoid fever (*Salmonella typhi*)
Viral pericarditis, myocarditis, or meningitis (unless known not to be caused by enteroviruses).

Drainage/Secretion Precautions

Drainage/Secretion Precautions are designed to prevent infections that are transmitted by direct or indirect contact with purulent material or drainage from an infected body site. This newly created isolation category includes many infections formerly included in Wound and Skin Precautions, Discharge (lesion), and Secretion (oral) Precautions, which have been discontinued. Infectious diseases included in this category are those that result in the production of infective purulent material, drainage, or secretions, unless the disease is included in another isolation category that requires more rigorous precautions. For example, minor or limited skin, wound, or burn infections are included in this category, but major skin, wound, or burn infections are included in Contact Isolation. (If you have questions about a specific disease, see the alphabetical listing of infectious diseases in Table A, Category-Specific Isolation Precautions.)

Specifications for Drainage/Secretion Precautions

1. Private room is not indicated.
2. Masks are not indicated.
3. Gowns are indicated if soiling is likely.
4. Gloves are indicated for touching infective material.
5. Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.
6. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

Diseases Requiring Drainage/Secretion Precautions

The following infections are examples of those included in this category provided they are *not* a) caused by multiply-resistant microorganisms, b) major (draining and not covered by a dressing or dressing does not adequately contain the drainage) skin, wound, or burn infections, including those caused by *Staphylococcus aureus* or group A *Streptococcus,* or c) gonococcal eye infections in newborns. See Contact Isolation if the infection is 1 of these 3.

Abscess, minor or limited
Burn infection, minor or limited
Conjunctivitis
Decubitus ulcer, infected, minor or limited
Skin infection, minor or limited
Wound infection, minor or limited

Blood/Body Fluid Precautions

Blood/Body Fluid Precautions are designed to prevent infections that are transmitted by direct or indirect contact with infective blood or body fluids. Infectious diseases included in this category are those that result in the production of infective blood or body fluids, unless the disease is included in another isolation category that requires more rigorous precautions, for example, Strict Isolation. (If you have questions about a specific disease, see the alphabetical listing of infectious diseases in Table A, Category-Specific Isolation Precautions.) For some diseases included in this category, such as malaria, only blood is infective; for other diseases, such as hepatitis B (including antigen carriers), blood and body fluids (saliva, semen, etc.) are infective.

Specifications for Blood/Body Fluid Precautions

1. Private room is indicated if patient hygiene is poor. A patient with poor hygiene does not wash hands after touching infective material, contaminates the environment with infective material, or shares contaminated articles with other patients. In general, patients infected with the same organism may share a room.
2. Masks are not indicated.
3. Gowns are indicated if soiling of clothing with blood or body fluids is likely.
4. Gloves are indicated for touching blood or body fluids.
5. Hands must be washed immediately if they are potentially contaminated with blood or body fluids and before taking care of another patient.
6. Articles contaminated with blood or body fluids should be discarded or bagged and labeled before being sent for decontamination and reprocessing.
7. Care should be taken to avoid needle-stick injuries. Used needles should not be recapped or bent; they should be placed in a prominently labeled, puncture-resistant container designated specifically for such disposal.
8. Blood spills should be cleaned up promptly with a solution of 5.25% sodium hypochlorite diluted 1:10 with water.

Diseases Requiring Blood/Body Fluid Precautions

Acquired immunodeficiency syndrome (AIDS)
Arthropodborne viral fevers (for example, dengue, yellow fever, and Colorado tick fever)
Babesiosis
Creutzfeldt-Jakob disease
Hepatitis B (including HBsAg antigen carrier)
Hepatitis, non-A, non-B
Leptospirosis
Malaria
Rat-bite fever
Relapsing fever
Syphilis, primary and secondary with skin and mucous membrane lesions

TABLE A. Category-Specific Isolation Precautions

Table A, Category-Specific Isolation Precautions, lists most of the common infectious agents and diseases that are likely to be found in U.S. hospitals and the category of isolation indicated for each. Diseases are listed alphabetically in several ways: by anatomical site or syndrome (abscess, burn wound, cellulitis, etc.), by etiologic agent (*Chlamydia trachomatis, Clostridium perfringens, Escherichia coli,* etc.), and sometimes by a combination of syndrome and etiologic agent (endometritis, group A *Streptococcus*; pneumonia, *Staphylococcus aureus,* etc.). In an attempt to make the table useful to all hospital personnel, including those from nonclinical areas (admitting, dietary, housekeeping, laundry, etc.), we have also included common terminology and jargon (such as gangrene

and "TORCH" syndrome) in the alphabetical listing of diseases.

For some diseases or conditions listed in Table A, we recommend more stringent isolation precautions for infants and young children than for adults since the risk of spread and the consequences of infection are greater in infants and young children. We use the term "young children" rather than an age breakpoint because children mature at such different rates. Thus, the interpretation of the term "young children" will differ in various pediatric settings according to patient population.

In addition to showing the category of isolation for each disease, Table A, Category-Specific Isolation Precautions, identifies which secretions, excretions, discharges, body fluids, and tissues are infective or might be infective. Again, common terms such as feces and pus are used to describe infective material. In the table the term "pus" refers to grossly purulent as well as serous drainage that is likely to be infective. In the table we also tell how long to apply the category-specific precautions for each disease and, in the comments column, list other considerations that personnel should be aware of when taking care of an infected or colonized patient for whom isolation precautions are indicated. Additional information essential to understanding and properly using category-specific isolation precautions is contained in the first part of this section in Techniques for Isolation Precautions (page 9).

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Abscess, etiology unknown				
Draining, major	Contact Isolation	Pus	Duration of illness	Major = no dressing or dressing does not adequately contain the pus.
Draining, minor or limited	Drainage/ Secretion Precautions	Pus	Duration of illness	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small, such as a stitch abscess.
Not draining	None			
Acquired immunodeficiency syndrome (AIDS)	Blood/Body Fluid Precautions	Blood and body fluids	Duration of illness	Use caution when handling blood and blood-soiled articles. Take special care to avoid needle-stick injuries. If gastrointestinal bleeding is likely, wear gloves if touching feces. (Acquired immune deficiency syndrome [AIDS]: precautions for clinical and laboratory staffs. MMWR 1982; 31:577–80.)
Actinomycosis, all lesions	None			
Adenovirus infection, respiratory in infants and young children	Contact Isolation	Respiratory secretions and feces	Duration of hospitalization	During epidemics patients believed to have adenovirus infection may be placed in the same room (cohorting).
Amebiasis				
Dysentery	Enteric Precautions	Feces	Duration of illness	
Liver abscess	None			
Anthrax				
Cutaneous	Drainage/ Secretion Precautions	Pus	Duration of illness	
Inhalation	Drainage/ Secretion Precautions	Respiratory secretions may be	Duration of illness	

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Arthropodborne viral encephalitides (eastern equine, western equine, and Venezuelan equine encephalomyelitis, St. Louis and California encephalitis)	None			
Arthropodborne viral fevers (dengue, yellow fever, and Colorado tick fever)	Blood/Body Fluid Precautions	Blood	Duration of hospitalization	
Ascariasis	None			
Aspergillosis	None			
Babesiosis	Blood/Body Fluid Precautions	Blood	Duration of illness	
Blastomycosis, North American, cutaneous or pulmonary	None			
Botulism				
Infant	None			
Other	None			
Bronchiolitis, etiology unknown in infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	Various etiologic agents, such as respiratory syncytial virus, parainfluenza viruses, adenoviruses, and influenza viruses, have been associated with this syndrome (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book); therefore, precautions to prevent their spread are generally indicated.
Bronchitis, infective, etiology unknown				
Adults	None	Respiratory secretions may be		
Infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	
Brucellosis (undulant fever, Malta fever, Mediterranean fever)				
Draining lesions, limited or minor	Drainage/ Secretion Precautions	Pus	Duration of illness	Limited or minor = dressing covers and adequately contains the pus, or infected area is very small.
Other	None			
Burn wound (see separate section on Care of Patients with Burns)				
Campylobacter gastroenteritis	Enteric Precautions	Feces	Duration of illness	
Candidiasis, all forms, including mucocutaneous (moniliasis, thrush)	None			
Cat-scratch fever (benign inoculation lymphoreticulosis)	None			

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRE-CAUTIONS HOW LONG?	COMMENTS
Cellulitis				
Draining, limited or minor	Drainage/ Secretion Precautions	Pus	Duration of illness	Limited or minor = dressing covers and adequately contains the pus, or infected area is very small.
Intact skin	None			
Chancroid (soft chancre)	None			
Chickenpox (varicella)	Strict Isolation	Respiratory secretions and lesion secretions	Until all lesions are crusted	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of room. Special ventilation for the room, if available, may be advantageous, especially for outbreak control. Neonates born to mothers with active varicella should be placed in Strict Isolation at birth. Exposed susceptible patients should be placed in Strict Isolation beginning 10 days after exposure and continuing until 21 days after last exposure. See CDC Guideline for Infection Control in Hospital Personnel for recommendations for exposed susceptible personnel.
Chlamydia trachomatis infection				
Conjunctivitis	Drainage/ Secretion Precautions	Purulent exudate	Duration of illness	
Genital	Drainage/ Secretion Precautions	Genital discharge	Duration of illness	
Respiratory	Drainage/ Secretion Precautions	Respiratory secretions	Duration of illness	
Cholera	Enteric Precautions	Feces	Duration of illness	
Closed-cavity infection				
Draining, limited or minor	Drainage/ Secretion Precautions	Pus	Duration of illness	Limited or minor = dressing covers and adequately contains the pus, or infected area is very small.
Not draining	None			
Clostridium perfringens				
Food poisoning	None			
Gas gangrene	Drainage/ Secretion Precautions	Pus	Duration of illness	
Other	Drainage/ Secretion Precautions	Pus	Duration of illness	

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Coccidioidomycosis (valley fever)				
Draining lesions	None	Drainage may be if spores form		
Pneumonia	None			
Colorado tick fever	Blood/Body Fluid Precautions	Blood	Duration of hospitalization	
Common cold				
Adults	None	Respiratory secretions may be		
Infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	Although rhinoviruses are most frequently associated with the common cold and are mild in adults, severe infections may occur in infants and young children. Other etiologic agents, such as respiratory syncytial virus and parainfluenza viruses, may also cause this syndrome (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book); therefore, precautions to prevent their spread are generally indicated.
Congenital rubella	Contact Isolation	Urine and respiratory secretions	During any admission for the 1st year after birth unless nasopharyngeal and urine cultures after 3 months of age are negative for rubella virus.	Susceptible persons should, if possible, stay out of room. Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel).
Conjunctivitis, acute bacterial (sore eye, pink eye)	Drainage/ Secretion Precautions	Purulent exudate	Duration of illness	
Conjunctivitis, *Chlamydia*	Drainage/ Secretion Precautions	Purulent exudate	Duration of illness	
Conjunctivitis, gonococcal				
Adults	Drainage/ Secretion Precautions	Purulent exudate	For 24 hours after start of effective therapy	
Newborns	Contact Isolation	Purulent exudate	For 24 hours after start of effective therapy	

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Conjunctivitis, viral and etiology unknown (acute hemorrhagic and swimming pool conjunctivitis)	Drainage/ Secretion Precautions	Purulent exudate	Duration of illness	If patient hygiene is poor, a private room may be indicated.
Coronavirus infection, respiratory				
Adults	None	Respiratory secretions may be		
Infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	
Coxsackievirus disease	Enteric Precautions	Feces and respiratory secretions	For 7 days after onset	
Creutzfeldt-Jakob disease	Blood/Body Fluid Precautions	Blood, brain tissue, and spinal fluid	Duration of hospitalization	Use caution when handling blood, brain tissue, or spinal fluid. (Jarvis WR. Precautions for Creutzfeldt-Jakob disease. Infect Control 1982; 3:238-9.)
Croup	Contact Isolation	Respiratory secretions	Duration of illness	Because viral agents, such as parainfluenza viruses and influenza A virus, have been associated with this syndrome (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book), precautions to prevent their spread are generally indicated.
Cryptococcosis	None			
Cysticercosis	None			
Cytomegalovirus infection, neonatal or immunosuppressed	None	Urine and respiratory secretions may be		Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel).
Decubitus ulcer, infected				
Major	Contact Isolation	Pus	Duration of illness	Major = draining and not covered by dressing or dressing does not adequately contain the pus.
Minor or limited	Drainage/ Secretion Precautions	Pus	Duration of illness	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small.
Dengue	Blood/Body Fluid Precautions	Blood	Duration of hospitalization	
Diarrhea, acute—infective etiology suspected (see gastroenteritis)	Enteric Precautions	Feces	Duration of illness	

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Diphtheria				
Cutaneous	Contact Isolation	Lesion secretions	Until 2 cultures from skin lesions, taken at least 24 hours apart after cessation of antimicrobial therapy, are negative for *Corynebacterium diphtheriae*	
Pharyngeal	Strict Isolation	Respiratory secretions	Until 2 cultures from both nose and throat taken at least 24 hours apart after cessation of antimicrobial therapy are negative for *Corynebacterium diphtheriae*	
Echinococcosis (hydatidosis)	None			
Echovirus disease	Enteric Precautions	Feces and respiratory secretions	For 7 days after onset	
Eczema vaccinatum (vaccinia)	Contact Isolation	Lesion secretions	Duration of illness	
Encephalitis or encephalomyelitis, etiology unknown, but infection suspected (see also specific etiologic agents; likely causes include enterovirus and arthropodborne virus infections)	Enteric Precautions	Feces	Duration of illness or 7 days after onset, whichever is less	Although specific etiologic agents can include enteroviruses, arthropodborne viruses, and herpes simplex, precautions for enteroviruses are generally indicated until a definitive diagnosis can be made.
Endometritis				
Group A *Streptococcus*	Contact Isolation	Vaginal discharge	For 24 hours after start of effective therapy	
Other	Drainage/ Secretion Precautions	Vaginal discharge	Duration of illness	
Enterobiasis (pinworm disease, oxyuriasis)	None			

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Enterocolitis (see also necrotizing enterocolitis)				
Clostridium difficile	Enteric Precautions	Feces	Duration of illness	
Staphylococcus	Enteric Precautions	Feces	Duration of illness	
Enteroviral infection	Enteric Precautions	Feces	For 7 days after onset	
Epiglottitis, due to *Haemophilus influenzae*	Respiratory Isolation	Respiratory secretions	For 24 hours after start of effective therapy	
Epstein-Barr virus infection, any, including infectious mononucleosis	None	Respiratory secretions may be		
Erysipeloid	None			
Erythema infectiosum	Respiratory Isolation	Respiratory secretions	For 7 days after onset	
Escherichia coli gastroenteritis (enteropathogenic, enterotoxic, or enteroinvasive)	Enteric Precautions	Feces	Duration of hospitalization	
Fever of unknown origin (FUO)				Patients with FUO usually do not need isolation precautions; however, if a patient has signs and symptoms compatible with (and is likely to have) a disease that requires isolation precautions, use those isolation precautions for that patient.
Food poisoning				
Botulism	None			
Clostridium perfringens or *welchii* (food poisoning)	None			
Salmonellosis	Enteric Precautions	Feces	Duration of illness	
Staphylococcal food poisoning	None			
Furunculosis—staphylococcal				
Newborns	Contact Isolation	Pus	Duration of illness	During a nursery outbreak, cohorting of ill and colonized infants and use of gowns and gloves is recommended.
Others	Drainage/ Secretion Precautions	Pus	Duration of illness	
Gangrene				
Gas gangrene (due to any bacteria)	Drainage/ Secretion Precautions	Pus	Duration of illness	

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Gastroenteritis				
Campylobacter species	Enteric Precautions	Feces	Duration of illness	
Clostridium difficile	Enteric Precautions	Feces	Duration of illness	
Cryptosporidium species	Enteric Precautions	Feces	Duration of illness	
Dientamoeba fragilis	Enteric Precautions	Feces	Duration of illness	
Escherichia coli (enteropathogenic, enterotoxic, or enteroinvasive)	Enteric Precautions	Feces	Duration of illness	
Giardia lamblia	Enteric Precautions	Feces	Duration of illness	
Rotavirus	Enteric Precautions	Feces	Duration of illness or 7 days after onset, whichever is less	
Salmonella species	Enteric Precautions	Feces	Duration of illness	
Shigella species	Enteric Precautions	Feces	Until 3 consecutive cultures of feces taken after ending antimicrobial therapy are negative for infecting strain	
Unknown etiology	Enteric Precautions	Feces	Duration of illness	
Vibrio parahaemolyticus	Enteric Precautions	Feces	Duration of illness	
Viral	Enteric Precautions	Feces	Duration of illness	
Yersinia enterocolitica	Enteric Precautions	Feces	Duration of illness	
German measles (rubella) (see also congenital rubella)	Contact Isolation	Respiratory secretions	For 7 days after onset of rash	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of room. Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel).
Giardiasis	Enteric Precautions	Feces	Duration of illness	

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Gonococcal ophthalmia neonatorum (gonorrheal ophthalmia, acute conjunctivitis of the newborn)	Contact Isolation	Purulent exudate	For 24 hours after start of effective therapy	
Gonorrhea	None	Discharge may be		
Granulocytopenia	None			Wash hands well *before* taking care of patient (see separate section on Care of Severely Compromised Patients).
Granuloma inguinale (donovaniasis, granuloma venereum)	None	Drainage may be		
Guillain-Barré syndrome	None			
Hand, foot, and mouth disease	Enteric Precautions	Feces	For 7 days after onset	
Hemorrhagic fevers (for example, Lassa fever)	Strict Isolation	Blood, body fluids, and respiratory secretions	Duration of illness	Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Hepatitis, viral				
Type A (infectious)	Enteric Precautions	Feces may be	For 7 days after onset of jaundice	Hepatitis A is most contagious before symptoms and jaundice appear; once these appear, small, inapparent amounts of feces, which may contaminate the hands of personnel during patient care, do not appear to be infective. Thus, gowns and gloves are most useful when gross soiling with feces is anticipated or possible.
Type B (''serum hepatitis''), including hepatitis B antigen (HBsAg) carrier	Blood/Body Fluid Precautions	Blood and body fluids	Until patient is HBsAg-negative	Use caution when handling blood and blood-soiled articles. Take special care to avoid needle-stick injuries. Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel). Gowns are indicated when clothing may become contaminated with body fluids or blood (for example, when blood splattering is anticipated). If gastrointestinal bleeding is likely, wear gloves if touching feces. A private room may be indicated if profuse bleeding is likely to cause environmental contamination.
Non-A, Non-B	Blood/Body Fluid Precautions	Blood and body fluids	Duration of illness	Currently, the period of infectivity cannot be determined.
Unspecified type, consistent with viral etiology				Maintain precautions indicated for the infections that are most likely.

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Herpangina	Enteric Precautions	Feces	For 7 days after onset	
Herpes simplex (*Herpesvirus hominis*)				
Encephalitis	None			
Mucocutaneous, disseminated or primary, severe (skin, oral, and genital)	Contact Isolation	Lesion secretions from infected site	Duration of illness	
Mucocutaneous, recurrent (skin, oral, and genital)	Drainage/ Secretion Precautions	Lesion secretions from infected site	Until all lesions are crusted	
Neonatal (see comments for newborn with perinatal exposure)	Contact Isolation	Lesion secretions	Duration of illness	The same isolation precautions are indicated for infants delivered (either vaginally or by cesarean section if membranes have been ruptured for more than 4–6 hours) to women with active genital herpes simplex infections. Infants delivered by cesarean section to women with active genital herpes simplex infections before and probably within 4–6 hours after membrane rupture are at minimal risk of developing herpes simplex infection; the same isolation precautions may still be indicated, however. (American Academy of Pediatrics Committee on Fetus and Newborn. Perinatal herpes simplex virus infections. Pediatrics 1980; 66:147–9. Also: Kibrick S, Herpes simplex infection at term. JAMA 1980; 243:157–60.)
Herpes zoster (varicella-zoster)				
Localized in immunocompromised patient, or disseminated	Strict Isolation	Lesion secretions and possibly respiratory secretions	Duration of illness	Localized lesions in immunocompromised patients frequently become disseminated. Because such dissemination is unpredictable, use the same isolation precautions as for disseminated disease. Persons who are not susceptible do not need to wear a mask. Persons susceptible to varicella-zoster (chickenpox) should, if possible, stay out of room. Special ventilation for the room, if available, may be advantageous, especially for outbreak control. Exposed susceptible patients should be placed in Strict Isolation beginning 10 days after exposure and continuing until 21 days after last exposure. See CDC Guideline for Infection Control in Hospital Personnel for recommendations for exposed susceptible personnel.

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Herpes-zoster (cont.)				
Localized in normal patient	Drainage/ Secretion Precautions	Lesion secretions	Until all lesions are crusted	Persons susceptible to varicella-zoster (chickenpox) should, if possible, stay out of room. Roommates should not be susceptible to chickenpox. If patient hygiene is poor, a private room may be indicated.
Histoplasmosis at any site	None			
Hookworm disease (ancylostomiasis, uncinariasis)	None			
Immunocompromised status	None			Wash hands well *before* taking care of patients (see separate section on Care of Severely Compromised Patients).
Impetigo	Contact Isolation	Lesions	For 24 hours after start of effective therapy	
Infectious mononucleosis	None	Respiratory secretions may be		
Influenza				
Adults	None	Respiratory secretions may be		In the absence of an epidemic, influenza may be difficult to diagnose on clinical grounds. Most patients will have fully recovered by the time laboratory diagnosis is established; therefore, placing patients with suspect influenza on isolation precautions, although theoretically desirable, is simply not practical in most hospitals. During epidemics, the accuracy of clinical diagnosis increases, and patients believed to have influenza may be placed in the same room (cohorting). Amantadine prophylaxis may be useful to prevent symptomatic influenza A infections in high-risk patients during epidemics.
Infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	In the absence of an epidemic, influenza may be difficult to diagnose. During epidemics, patients believed to have influenza may be placed in the same room (cohorting).
Jakob-Creutzfeldt disease	Blood/Body Fluid Precautions	Blood, brain tissue, and spinal fluid	Duration of hospitalization	Use caution when handling blood, brain tissue, or spinal fluid. (Jarvis WR, Precautions for Creutzfeldt-Jakob disease. Infect Control 1982; 3:238–9.)
Kawasaki syndrome	None			
Keratoconjunctivitis, infective	Drainage/ Secretion Precautions	Purulent exudate	Duration of illness	If patient hygiene is poor, a private room may be indicated.

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Lassa fever	Strict Isolation	Blood, body fluids, and respiratory secretions	Duration of illness	Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Legionnaires' disease	None	Respiratory secretions may be		
Leprosy	None			
Leptospirosis	Blood/Body Fluid Precautions	Blood and urine	Duration of hospitalization	
Listeriosis	None			
Lyme disease	None			
Lymphocytic choriomeningitis	None			
Lymphogranuloma venereum	None	Drainage may be		
Malaria	Blood/Body Fluid Precautions	Blood	Duration of illness	
Marburg virus disease	Strict Isolation	Blood, body fluids, and respiratory secretions	Duration of illness	Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Measles (rubeola), all presentations	Respiratory Isolation	Respiratory secretions	For 4 days after start of rash, except in immunocompromised patients, with whom precautions should be maintained for duration of illness	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of room.
Melioidosis, all forms	None	Respiratory secretions may be, and, if a sinus is draining, drainage may be		
Meningitis				
Aseptic (nonbacterial or viral meningitis) (also see specific etiologies)	Enteric Precautions	Feces	For 7 days after onset	Enteroviruses are the most common cause of aseptic meningitis.
Bacterial, gram-negative enteric, in neonates	None	Feces may be		During a nursery outbreak, cohort ill and colonized infants, and use gowns if soiling is likely and gloves if touching feces.

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Meningitis (cont.)				
Fungal	None			
Haemophilus influenzae, known or suspected	Respiratory Isolation	Respiratory secretions	For 24 hours after start of effective therapy	
Listeria monocytogenes	None			
Neisseria meningitidis (meningococcal), known or suspected	Respiratory Isolation	Respiratory secretions	For 24 hours after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Pneumococcal	None			
Tuberculous	None			Patient should be examined for evidence of current (active) pulmonary tuberculosis. If present, precautions are necessary (see tuberculosis).
Other diagnosed bacterial	None			
Meningococcal pneumonia	Respiratory Isolation	Respiratory secretions	For 24 hours after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Meningococcemia (meningococcal sepsis)	Respiratory Isolation	Respiratory secretions	For 24 hours after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Molluscum contagiosum	None			
Mucormycosis	None			
Multiply-resistant organisms,* infection or colonization†				
Gastrointestinal	Contact Isolation	Feces	Until off antimicrobials and culture-negative	In outbreaks, cohorting of infected and colonized patients may be indicated if private rooms are not available.
Respiratory	Contact Isolation	Respiratory secretions and possibly feces	Until off antimicrobials and culture-negative	In outbreaks, cohorting of infected and colonized patients may be indicated if private rooms are not available.
Skin, Wound, or Burn	Contact Isolation	Pus and possibly feces	Until off antimicrobials and culture-negative	In outbreaks, cohorting of infected and colonized patients may be indicated if private rooms are not available.

*The following multiply-resistant organisms are included:
1) Gram-negative bacilli resistant to all aminoglycosides that are tested. (In general, such organisms should be resistant to gentamicin, tobramycin, and amikacin for these special precautions to be indicated.)
2) *Staphylococcus aureus* resistant to methicillin (or nafcillin or oxacillin if they are used instead of methicillin for testing).
3) *Pneumococcus* resistant to penicillin.
4) *Haemophilus influenzae* resistant to ampicillin (beta-lactamase positive) and chloramphenicol.
5) Other resistant bacteria may be included if they are judged by the infection control team to be of special clinical and epidemiologic significance.

†Colonization may involve more than 1 site.

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Multiply-resistant organisms (cont.)				
Urinary	Contact Isolation	Urine and possibly feces	Until off antimicrobials and culture-negative	Urine and urine-measuring devices are sources of infection, especially if the patient (or any nearby patients) has indwelling urinary catheter. In outbreaks, cohorting of infected and colonized patients may be indicated if private rooms are not available.
Mumps (infectious parotitis)	Respiratory Isolation	Respiratory secretions	For 9 days after onset of swelling	Persons who are not susceptible do not need to wear a mask.
Mycobacteria, nontuberculous (atypical)				
Pulmonary	None			
Wound	Drainage/ Secretion Precautions	Drainage may be	Duration of drainage	
Mycoplasma pneumonia	None	Respiratory secretions may be		A private room may be indicated for children.
Necrotizing enterocolitis	Enteric Precautions	Feces may be	Duration of illness	In nurseries, cohorting of ill infants is recommended. It is not known whether or how this disease is transmitted; nevertheless, gowns are recommended if soiling is likely, and gloves are recommended for touching feces.
Neutropenia	None			Wash hands well *before* taking care of patient (see separate section on Care of Severely Compromised Patients).
Nocardiosis				
Draining lesions	None	Drainage may be		
Other	None			
Norwalk agent gastroenteritis	Enteric Precautions	Feces	Duration of illness	
Orf	None	Drainage may be		
Parainfluenza virus infection, respiratory in infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	During epidemics, patients believed to have parainfluenza virus infection may be placed in the same room (cohorting).
Pediculosis	Contact Isolation	Infested area	For 24 hours after start of effective therapy	Masks are not needed.
Pertussis (''whooping cough'')	Respiratory Isolation	Respiratory secretions	For 7 days after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Pharyngitis, infective, etiology unknown				
Adults	None	Respiratory secretions may be		
Infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	Because adenoviruses, influenza viruses, and parainfluenza viruses have been associated with this syndrome (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book), precautions to prevent their spread are generally indicated.
Pinworm infection	None			
Plague				
Bubonic	Drainage/ Secretion Precautions	Pus	For 3 days after start of effective therapy	
Pneumonic	Strict Isolation	Respiratory secretions	For 3 days after start of effective therapy	
Pleurodynia	Enteric Precautions	Feces	For 7 days after onset	Enteroviruses frequently cause infection.
Pneumonia				
Bacterial not listed elsewhere (including gram-negative bacterial)	None	Respiratory secretions may be		
Chlamydia	Drainage/ Secretion Precautions	Respiratory secretions	Duration of illness	
Etiology unknown				Maintain precautions indicated for the etiology that is most likely.
Fungal	None			
Haemophilus influenzae				
Adults	None	Respiratory secretions may be		
Infants and children (any age)	Respiratory Isolation	Respiratory secretions	For 24 hours after start of effective therapy	
Legionnella	None	Respiratory secretions may be		

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Pneumonia (cont.)				
Meningococcal	Respiratory Isolation	Respiratory secretions	For 24 hours after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Multiply-resistant bacterial	Contact Isolation	Respiratory secretions and possibly feces	Until off antimicrobials and culture-negative	In outbreaks, cohorting of infected and colonized patients may be necessary if private rooms are not available.
Mycoplasma (primary atypical pneumonia, Eaton agent pneumonia)	None	Respiratory secretions may be		A private room may be useful for children.
Pneumococcal	None	Respiratory secretions may be for 24 hours after start of effective therapy		
Pneumocystis carinii	None			
Staphylococcus aureus	Contact Isolation	Respiratory secretions	For 48 hours after start of effective therapy	
Streptococcus, group A	Contact Isolation	Respiratory secretions	For 24 hours after start of effective therapy	
Viral (see also specific etiologic agents)				
Adults	None	Respiratory secretions may be		
Infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	Viral pneumonia may be caused by various etiologic agents, such as parainfluenza viruses, influenza viruses, and particularly, respiratory syncytial virus, in children less than 5 years old (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book); therefore, precautions to prevent their spread are generally indicated.
Poliomyelitis	Enteric Precautions	Feces	For 7 days after onset	
Psittacosis (ornithosis)	None	Respiratory secretions may be		
Q fever	None	Respiratory secretions may be		

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Rabies	Contact Isolation	Respiratory secretions	Duration of illness	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Rat-bite fever (*Streptobacillus moniliformis* disease, *Spirillum minus* disease)	Blood/Body Fluid Precautions	Blood	For 24 hours after start of effective therapy	
Relapsing fever	Blood/Body Fluid Precautions	Blood	Duration of illness	
Resistant bacterial (see multiply-resistant bacteria)				
Respiratory infectious disease, acute (if not covered elsewhere)				
Adults	None	Respiratory secretions may be		
Infants and young children				Maintain precautions for the bacterial or viral infections that are most likely.
Respiratory syncytial virus (RSV) infection, in infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	During epidemics, patients believed to have RSV infection may be placed in the same room (cohorting).
Reye syndrome	None			
Rheumatic fever	None			
Rhinovirus infection, respiratory				
Adults	None	Respiratory secretions may be		
Infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	
Rickettsial fevers, tickborne (Rocky Mountain spotted fever, tickborne typhus fever)	None	Blood may be		
Rickettsialpox (vesicular rickettsiosis)	None			
Ringworm (dermatophytosis, dermatomycosis, tinea)	None			
Ritter's disease (staphylococcal scalded skin syndrome)	Contact Isolation	Lesion drainage	Duration of illness	
Rocky Mountain spotted fever	None	Blood may be		
Roseola infantum (exanthem subitum)	None			
Rotavirus infection (viral gastroenteritis)	Enteric Precautions	Feces	Duration of illness or 7 days after onset, whichever is less	

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Rubella (''German measles'') (see also congenital rubella)	Contact Isolation	Respiratory secretions	For 7 days after onset of rash	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of room. Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel).
Salmonellosis	Enteric Precautions	Feces	Duration of illness	
Scabies	Contact Isolation	Infested area	For 24 hours after start of effective therapy	Masks are not needed.
Scalded skin syndrome, staphylococcal (Ritter's disease)	Contact Isolation	Lesion drainage	Duration of illness	
Schistosomiasis (bilharziasis)	None			
Shigellosis (including bacillary dysentery)	Enteric Precautions	Feces	Until 3 consecutive cultures of feces, taken after ending antimicrobial therapy, are negative for infecting strain	
Smallpox (variola)	Strict Isolation	Respiratory secretions and lesion secretions	Duration of illness	As long as smallpox virus is kept stocked in laboratories, the potential exists for cases to occur. Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Spirillium minus disease (rat-bite fever)	Blood/Body Fluid Precautions	Blood	For 24 hours after start of effective therapy	
Sporotrichosis	None			
Staphylococcal disease (*S. aureus*)				
Skin, wound, or burn infection				
Major	Contact Isolation	Pus	Duration of illness	Major = draining and not covered by dressing or dressing does not adequately contain the pus.
Minor or limited	Drainage/ Secretion Precautions	Pus	Duration of illness	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small.
Enterocolitis	Enteric Precautions	Feces	Duration of illness	

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRE-CAUTIONS HOW LONG?	COMMENTS
Staphylococcal disease (cont.)				
Pneumonia or draining lung abscess	Contact Isolation	Respiratory secretions	For 48 hours after start of effective therapy	
Scalded skin syndrome	Contact Isolation	Lesion drainage	Duration of illness	
Toxic shock syndrome	Drainage/ Secretion Precautions	Vaginal discharge or pus	Duration of illness	
Streptobacillus moniliformis disease (rat-bite fever)	Blood/Body Fluid Precautions	Blood	For 24 hours after start of effective therapy	
Streptococcal disease (group A *Streptococcus*)				
Skin, wound, or burn infection				
Major	Contact Isolation	Pus	For 24 hours after start of effective therapy	Major = draining and not covered by dressing or dressing does not adequately contain the pus.
Minor or limited	Drainage/ Secretion Precautions	Pus	For 24 hours after start of effective therapy	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small.
Endometritis (puerperal sepsis)	Contact Isolation	Vaginal discharge	For 24 hours after start of effective therapy	
Pharyngitis	Drainage/ Secretion Precautions	Respiratory secretions	For 24 hours after start of effective therapy	
Pneumonia	Contact Isolation	Respiratory secretions	For 24 hours after start of effective therapy	
Scarlet fever	Drainage/ Secretion Precautions	Respiratory secretions	For 24 hours after start of effective therapy	
Streptococcal disease (group B *Streptococcus*), neonatal	None	Feces may be		During a nursery outbreak, cohorting of ill and colonized infants and use of gowns and gloves is recommended.
Streptococcal disease (not group A or B) unless covered elsewhere	None			

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Strongyloidiasis	None	Feces may be		If patient is immunocompromised and has pneumonia or has disseminated disease, respiratory secretions may be infective.
Syphilis				
Skin and mucous membrane, including congenital, primary, and secondary	Drainage/ Secretion Precautions, Blood/Body Fluid Precautions	Lesion secretions and blood	For 24 hours after start of effective therapy	Skin lesions of primary and secondary syphilis may be highly infective.
Latent (tertiary) and seropositivity without lesions	None			
Tapeworm disease				
Hymenolepis nana	None	Feces may be		
Taenia solium (pork)	None	Feces may be		
Other	None			
Tetanus	None			
Tinea (fungus infection, dermatophytosis, dermatomycosis, ringworm)	None			
"TORCH" syndrome (If congenital forms of the following diseases are seriously being considered, see separate listing for these diseases: toxoplasmosis, rubella, cytomegalovirus, herpes, and syphilis.)				
Toxic shock syndrome (staphylococcal disease)	Drainage/ Secretion Precautions	Vaginal discharge and pus	Duration of illness	
Toxoplasmosis	None			
Trachoma, acute	Drainage/ Secretion Precautions	Purulent exudate	Duration of illness	
Trench mouth (Vincent's angina)	None			
Trichinosis	None			
Trichomoniasis	None			
Trichuriasis (whipworm disease)	None			
Tuberculosis				
Extrapulmonary, draining lesion (including scrofula)	Drainage/ Secretion Precautions	Pus	Duration of drainage	A private room is especially important for children.
Extrapulmonary, meningitis	None			

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Tuberculosis (cont.)				
Pulmonary, confirmed or suspected (sputum smear is positive or chest X-ray appearance strongly suggests current [active] TB, for example, a cavitary lesion is found), or laryngeal disease.	Tuberculosis Isolation (AFB Isolation)	Airborne droplet nuclei	In most instances the duration of isolation precautions can be guided by clinical response and a reduction in numbers of TB organisms on sputum smear. Usually this occurs within 2–3 weeks after chemotherapy is begun. When the patient is likely to be infected with isoniazid-resistant organisms, apply precautions until patient is improving and sputum smear is negative for TB organisms.	Prompt use of effective antituberculous drugs is the most effective means of limiting transmission. Gowns are not important because TB is rarely spread by fomites, although gowns are indicated to prevent gross contamination of clothing. For more detailed guidelines refer to "Guidelines for Prevention of TB Transmission in Hospitals" (1982), Tuberculosis Control Division, Center for Prevention Services, Centers for Disease Control, Atlanta, GA (HHS Publication No. [CDC] 82-8371) and CDC Guideline for Infection Control in Hospital Personnel. In general, infants and young children do not require isolation precautions because they rarely cough and their bronchial secretions contain few TB organisms compared to adults with pulmonary TB.
Skin-test positive with no evidence of current pulmonary disease (sputum smear is negative, X-ray not suggestive of current [active] disease)	None			
Tularemia				
Draining lesion	Drainage/ Secretion Precautions	Pus may be	Duration of illness	
Pulmonary	None	Respiratory secretions may be		
Typhoid fever	Enteric Precautions	Feces	Duration of illness	
Typhus, endemic and epidemic	None	Blood may be		
Urinary tract infection (including pyelonephritis), with or without urinary catheter	None			See multiply-resistant bacteria if infection is with these bacteria. Spatially separate infected and uninfected patients who have indwelling catheters (see CDC Guideline for Prevention of Catheter-associated Urinary Tract Infection).

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Vaccinia				
At vaccination site	Drainage/ Secretion Precautions	Lesion secretions	Duration of illness	
Generalized and progressive, eczema vaccinatum	Contact Isolation	Lesion secretions	Duration of illness	
Varicella (chickenpox)	Strict Isolation	Respiratory secretions and lesion secretions	Until all lesions are crusted	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of the room. Special ventilation for the room, if available, may be advantageous, especially for outbreak control. Neonates born to mothers with active varicella should be placed in Strict Isolation at birth. Exposed susceptible patients should be placed in Strict Isolation beginning 10 days after exposure and continuing until 21 days after last exposure. See CDC Guideline for Infection Control in Hospital Personnel for recommendations for exposed susceptible personnel.
Variola (smallpox)	Strict Isolation	Respiratory secretions and lesion secretions	Duration of illness	Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Vibrio parahaemolyticus gastroenteritis	Enteric Precautions	Feces	Duration of illness	
Vincent's angina (trench mouth)	None			
Viral diseases				
Pericarditis, myocarditis, or meningitis	Enteric Precautions	Feces and possibly respiratory secretions	For 7 days after onset	Enteroviruses frequently cause these infections.
Respiratory (if not covered elsewhere)				
Adults	None	Respiratory secretions may be		
Infants and young children	Contact Isolation	Respiratory secretions	Duration of illness	Various etiologic agents, such as respiratory syncytial virus, parainfluenza viruses, adenoviruses, and, influenza viruses, can cause viral respiratory infections (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book); therefore, precautions to prevent their spread are generally indicated.

Table A. Category-Specific Isolation Precautions

DISEASE	CATEGORY	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Whooping cough (pertussis)	Respiratory Isolation	Respiratory secretions	For 7 days after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Wound infections				
Major	Contact Isolation	Pus	Duration of illness	Major = draining and not covered by dressing or dressing does not adequately contain the pus.
Minor or limited	Drainage/ Secretion Precautions	Pus	Duration of illness	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small, such as a stitch abscess.
Yersinia enterocolitica gastroenteritis	Enteric Precautions	Feces	Duration of illness	
Zoster (varicella-zoster)				
Localized in immunocompromised patient, or disseminated	Strict Isolation	Lesion secretions	Duration of illness	Localized lesions in immunocompromised patients frequently become disseminated. Because such dissemination is unpredictable, use the same isolation precautions as with disseminated disease. Persons who are not susceptible do not need to wear a mask. Persons susceptible to varicella-zoster (chickenpox) should, if possible, stay out of the room. Special ventilation for room, if available, may be advantageous, especially for outbreak control. Exposed susceptible patients should be placed in Strict Isolation beginning 10 days after exposure and continuing until 21 days after last exposure. See CDC Guideline for Infection Control in Hospital Personnel for recommendations for exposed susceptible personnel.
Localized in normal patient	Drainage/ Secretion Precautions	Lesion secretions	Until all lesions are crusted	Persons susceptible to varicella-zoster (chickenpox) should, if possible, stay out of room. Roommates should not be susceptible to chickenpox.
Zygomycosis (phycomycosis, mucormycosis)	None			

Instruction Cards for Category-Specific Isolation Precautions

Instruction cards have been designed to give concise information about category-specific isolation precautions, and samples are shown on the following pages. The specific isolation precautions indicated for each category of isolation are listed on the front and back of a color-coded card. Cards should be displayed conspicuously in the immediate vicinity of the patient on isolation precautions (on the door, foot or head of bed, etc.). A duplicate card may also be attached to the front of the patient's chart.

(Front of Card)

Strict Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Masks are indicated for all persons entering room.
2. Gowns are indicated for all persons entering room.
3. Gloves are indicated for all persons entering room.
4. HANDS MUST BE WASHED AFTER TOUCHING THE PATIENT OR POTENTIALLY CONTAMINATED ARTICLES AND BEFORE TAKING CARE OF ANOTHER PATIENT.
5. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

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Diseases Requiring Strict Isolation*

Diphtheria, pharyngeal
Lassa fever and other viral hemorrhagic fevers, such as Marburg virus disease§
Plague, pneumonic
Smallpox§
Varicella (chickenpox)
Zoster, localized in immunocompromised patient, or disseminated

*A private room is indicated for Strict Isolation; in general, however, patients infected with the same organism may share a room. See Guideline for Isolation Precautions in Hospitals for details and for how long to apply precautions.
§A private room with special ventilation is indicated.

(Front of Card)

Contact Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Masks are indicated for those who come close to patient.
2. Gowns are indicated if soiling is likely.
3. Gloves are indicated for touching infective material.
4. HANDS MUST BE WASHED AFTER TOUCHING THE PATIENT OR POTENTIALLY CONTAMINATED ARTICLES AND BEFORE TAKING CARE OF ANOTHER PATIENT.
5. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

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Diseases or Conditions Requiring Contact Isolation*

Acute respiratory infections in infants and young children, including croup, colds, bronchitis, and bronchiolitis caused by respiratory syncytial virus, adenovirus, coronavirus, influenza viruses, parainfluenza viruses, and rhinovirus
Conjunctivitis, gonococcal, in newborns
Diphtheria, cutaneous
Endometritis, group A *Streptococcus*
Furunculosis, staphylococcal, in newborns
Herpes simplex, disseminated, severe primary or neonatal
Impetigo
Influenza, in infants and young children
Multiply-resistant bacteria, infection or colonization (any site) with any of the following:
1. Gram-negative bacilli resistant to all aminoglycosides that are tested. (In general, such organisms should be resistant to gentamicin, tobramycin, and amikacin for these special precautions to be indicated.)
2. *Staphylococcus aureus* resistant to methicillin (or nafcillin or oxacillin if they are used instead of methicillin for testing)
3. *Pneumococcus* resistant to penicillin
4. *Haemophilus influenzae* resistant to ampicillin (beta-lactamase positive) and chloramphenicol
5. Other resistant bacteria may be included in this isolation category if they are judged by the infection control team to be of special clinical and epidemiologic significance.

Pediculosis
Pharyngitis, infectious, in infants and young children
Pneumonia, viral, in infants and young children
Pneumonia, *Staphylococcus aureus* or group A *Streptococcus*
Rabies
Rubella, congenital and other
Scabies
Scalded skin syndrome (Ritter's disease)
Skin, wound, or burn infection, major (draining and not covered by a dressing or dressing does not adequately contain the purulent material), including those infected with *Staphylococcus aureus* or group A *Streptococcus*
Vaccinia (generalized and progressive eczema vaccinatum)

*A private room is indicated for Contact Isolation; in general, however, patients infected with the same organism may share a room. During outbreaks, infants and young children with the same respiratory clinical syndrome may share a room. See Guideline for Isolation Precautions in Hospitals for details and for how long to apply precautions.

(Front of Card)

Respiratory Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Masks are indicated for those who come close to patient.
2. Gowns are not indicated.
3. Gloves are not indicated.
4. HANDS MUST BE WASHED AFTER TOUCHING THE PATIENT OR POTENTIALLY CONTAMINATED ARTICLES AND BEFORE TAKING CARE OF ANOTHER PATIENT.
5. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

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Diseases Requiring Respiratory Isolation*

Epiglottitis, *Haemophilus influenzae*
Erythema infectiosum
Measles
Meningitis
    Haemophilus influenzae, known or suspected
    Meningococcal, known or suspected
Meningococcal pneumonia
Meningococcemia
Mumps
Pertussis (whooping cough)
Pneumonia, *Haemophilus influenzae*, in children (any age)

*A private room is indicated for Respiratory Isolation; in general, however, patients infected with the same organism may share a room. See Guideline for Isolation Precautions in Hospitals for details and for how long to apply precautions.

(Front of Card)

AFB Isolation

Visitors—Report to Nurses' Station Before Entering Room

1. Masks are indicated only when patient is coughing and does not reliably cover mouth.
2. Gowns are indicated only if needed to prevent gross contamination of clothing.
3. Gloves are not indicated.
4. HANDS MUST BE WASHED AFTER TOUCHING THE PATIENT OR POTENTIALLY CONTAMINATED ARTICLES AND BEFORE TAKING CARE OF ANOTHER PATIENT.
5. Articles should be discarded, cleaned, or sent for decontamination and reprocessing.

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Diseases Requiring AFB Isolation*

This isolation category is for patients with current pulmonary TB who have a positive sputum smear or a chest X-ray appearance that strongly suggests current (active) TB. Laryngeal TB is also included in this category. In general, infants and young children with pulmonary TB do not require isolation precautions because they rarely cough and their bronchial secretions contain few AFB compared with adults with pulmonary TB. To protect the patient's privacy, this instruction card is labeled AFB (acid-fast bacilli) Isolation rather than Tuberculosis Isolation.

*A private room with special ventilation is indicated for AFB isolation. In general, patients infected with the same organism may share a room. See Guideline for Isolation Precautions in Hospitals for details and for how long to apply precautions.

(Front of Card)

Enteric Precautions

Visitors—Report to Nurses' Station Before Entering Room

1. Masks are not indicated.
2. Gowns are indicated if soiling is likely.
3. Gloves are indicated for touching infective material.
4. HANDS MUST BE WASHED AFTER TOUCHING THE PATIENT OR POTENTIALLY CONTAMINATED ARTICLES AND BEFORE TAKING CARE OF ANOTHER PATIENT.
5. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamintion and reprocessing.

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Diseases Requiring Enteric Precautions*

Amebic dysentery
Cholera
Coxsackievirus disease
Diarrhea, acute illness with suspected infectious etiology
Echovirus disease
Encephalitis (unless known not to be caused by enteroviruses)
Enterocolitis caused by *Clostridium difficile* or *Staphylococcus aureus*
Enteroviral infection
Gastroenteritis caused by
- *Campylobacter* species
- *Cryptosporidium* species
- *Dientamoeba fragilis*
- *Escherichia coli* (enterotoxic, enteropathogenic, or enteroinvasive)
- *Giardia lamblia*
- *Salmonella* species
- *Shigella* species
- *Vibrio parahaemolyticus*
- Viruses—including Norwalk agent and rotavirus
- *Yersinia enterocolitica*
- Unknown etiology but presumed to be an infectious agent

Hand, foot, and mouth disease
Hepatitis, viral, type A
Herpangina
Meningitis, viral (unless known not to be caused by enteroviruses)
Necrotizing enterocolitis
Pleurodynia
Poliomyelitis
Typhoid fever (*Salmonella typhi*)
Viral pericarditis, myocarditis, or meningitis (unless known not to be caused by enteroviruses)

*A private room is indicated for Enteric Precautions if patient hygiene is poor. A patient with poor hygiene does not wash hands after touching infective material, contaminates the environment with infective material, or shares contaminated articles with other patients. In general, patients infected with the same organism may share a room. See Guideline for Isolation Precautions in Hospitals for details and for how long to apply precautions.

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Drainage/Secretion Precautions

Visitors—Report to Nurses' Station Before Entering Room

1. Masks are not indicated.
2. Gowns are indicated if soiling is likely.
3. Gloves are indicated for touching infective material.
4. HANDS MUST BE WASHED AFTER TOUCHING THE PATIENT OR POTENTIALLY CONTAMINATED ARTICLES AND BEFORE TAKING CARE OF ANOTHER PATIENT.
5. Articles contaminated with infective material should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

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Diseases Requiring Drainage/Secretion Precautions*

Infectious diseases included in this category are those that result in production of infective purulent material, drainage, or secretions, unless the disease is included in another isolation category that requires more rigorous precautions. (If you have questions about a specific disease, see the listing of infectious diseases in Guideline for Isolation Precautions in Hospitals, Table A, Disease-Specific Isolation Precautions.)

The following infections are examples of those included in this category provided they are *not* a) caused by multiply-resistant microorganisms, b) major (draining and not covered by a dressing or dressing does not adequately contain the drainage) skin, wound, or burn infections, including those caused by *Staphylococcus aureus* or group A *Streptococcus*, or c) gonococcal eye infections in newborns. See Contact Isolation if the infection is one of these 3.

Abscess, minor or limited
Burn infection, minor or limited
Conjunctivitis
Decubitus ulcer, infected, minor or limited
Skin infection, minor or limited
Wound infection, minor or limited

*A private room is usually not indicated for Drainage/Secretion Precautions. See Guideline for Isolation Precautions in Hospitals for details and for how long to apply precautions.

(Front of Card)

Blood/Body Fluid Precautions

Visitors—Report to Nurses' Station Before Entering Room

1. Masks are not indicated.
2. Gowns are indicated if soiling with blood or body fluids is likely.
3. Gloves are indicated for touching blood or body fluids.
4. HANDS SHOULD BE WASHED IMMEDIATELY IF THEY ARE POTENTIALLY CONTAMINATED WITH BLOOD OR BODY FLUIDS AND BEFORE TAKING CARE OF ANOTHER PATIENT.
5. Articles contaminated with blood or body fluids should be discarded or bagged and labeled before being sent for decontamination and reprocessing.
6. Care should be taken to avoid needle-stick injuries. Used needles should not be recapped or bent; they should be placed in a prominently labeled, puncture-resistant container designated specifically for such disposal.
7. Blood spills should be cleaned up promptly with a solution of 5.25% sodium hypochlorite diluted 1:10 with water.

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Diseases Requiring Blood/Body Fluid Precautions*

Acquired immunodeficiency syndrome (AIDS)
Arthropodborne viral fevers (for example, dengue, yellow fever, and Colorado tick fever)
Babesiosis
Creutzfeldt-Jakob disease
Hepatitis B (including HBsAg antigen carrier)
Hepatitis, non-A, non-B
Leptospirosis
Malaria
Rat-bite fever
Relapsing fever
Syphilis, primary and secondary with skin and mucous membrane lesions

*A private room is indicated for Blood/Body Fluid Precautions if patient hygiene is poor. A patient with poor hygiene does not wash hands after touching infective material, contaminates the environment with infective material, or shares contaminated articles with other patients. In general, patients infected with the same organism may share a room. See Guideline for Isolation Precautions in Hospitals for details and for how long to apply precautions.

SYSTEM B. DISEASE-SPECIFIC ISOLATION PRECAUTIONS

Disease-specific isolation precautions are 1 of 2 isolation systems recommended by CDC. Again, we emphasize that hospitals should choose either disease-specific or category-specific isolation recommendations: elements of both cannot easily be combined. With disease-specific isolation precautions, each infectious disease is considered individually so that only those precautions (private room, masks, gowns, and gloves) that are indicated to interrupt transmission for that disease are recommended. The theoretical advantage of using disease-specific isolation precautions rather than the alternative isolation system (category-specific isolation precautions) is saving of supplies and expense. Moreover, the excessive donning of masks, gowns, and gloves, when unnecessary, wastes time, is inconvenient, and may discourage hospital personnel from properly taking care of such patients. Furthermore, personnel may comply more fully with the disease-specific isolation precautions than with the category-specific precautions, especially physicians who are knowledgeable about modes of disease transmission. On the other hand, isolation precautions are often most important early in a patient's stay, before specific therapy has been begun, and before a diagnosis is confirmed. In such situations, category-specific precautions, which are more general, may be more practical and easier to implement.

The particular isolation precautions indicated for each disease are listed in Table B, Disease-Specific Isolation Precautions.

TABLE B. Disease-Specific Isolation Precautions

Table B, Disease-Specific Isolation Precautions lists most of the common infectious agents and diseases that are likely to be found in U.S. hospitals and the specific isolation precautions indicated for each. Diseases are listed alphabetically in several ways: by anatomical site or syndrome (abscess, burn wound, cellulitis, etc.), by etiologic agent (*Chlamydia trachomatis, Clostridium perfringens, Escherichia coli,* etc.) and sometimes by a combination of syndrome and etiologic agent (endometritis, group A *Streptococcus;* pneumonia, *Staphylococcus aureus,* etc.). In an attempt to make the table useful to all hospital personnel, including those from nonclinical areas (admitting, dietary, housekeeping, laundry, etc.), common terminology and jargon (such as gangrene and "TORCH" syndrome) are also used in the alphabetical listing of diseases.

For some diseases or conditions listed in Table B, we recommend more stringent isolation precautions for infants and young children than for adults since the risk of spread and the consequences of infection are greater in infants and young children. We use the term "young children" rather than an age breakpoint because children mature at such different rates. Thus, the interpretation of the term "young children" will differ in various pediatric settings according to the patient population.

Table B, Disease-Specific Isolation Precautions specifies by use of "no," "yes," or a qualified "yes" whether a private room, masks, gowns, or gloves is indicated for each disease. In general, patients infected with the same organism may share a room. For some diseases or conditions a private room is indicated if patient hygiene is poor. A patient with poor hygiene does not wash hands after touching infective material (feces, purulent drainage, or secretions), contaminates the environment with infective material, or shares contaminated articles with other patients. Likewise, for some diseases a mask is indicated only for those who get close (about 3 feet) to the patient. Handwashing is not listed in the table because it is important for all patient care, whether or not the patient is infected, and is always necessary to prevent transmission of infection.

In addition to including the specific precautions indicated for each disease, Table B, Disease-Specific Isolation Precautions, identifies which secretions, excretions, discharges, body fluids, and tissues are infective or might be infective. Again, common terms such as feces and pus are used to describe infective material. In the table the term "pus" refers to grossly purulent as well as serous drainage that is likely to be infective. In the table, we also tell how long to apply the precautions and other considerations that personnel should be aware of when taking care of an infected or colonized patient for whom isolation precautions are indicated. Additional information essential to understanding and properly using disease-specific isolation precautions is contained in the first part of this section in Techniques for Isolation Precautions (page 9).

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Abscess, etiology unknown							
Draining, major	Yes	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Major = no dressing or dressing does not adequately contain the pus.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Abscess, etiology unknown (cont.)							
Draining, minor or limited	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Minor or limited = dressing covers and adequately contains the pus, or infected area is small, such as a stitch abscess.
Not draining	No	No	No	No			
Acquired immunodeficiency syndrome (AIDS)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Blood and body fluids	Duration of illness	Use caution when handling blood and blood-soiled articles. Take special care to avoid needlestick injuries. If gastrointestinal bleeding is likely, wear gloves if touching feces. (Acquired immune deficiency syndrome [AIDS]: precautions for clinical and laboratory staffs. MMWR 1982; 31:577–80.)
Actinomycosis, all lesions	No	No	No	No			
Adenovirus infection, respiratory in infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions and feces	Duration of hospitalization	During epidemics patients believed to have adenovirus infection may be placed in the same room (cohorting).
Amebiasis							
Dysentery	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Liver abscess	No	No	No	No			
Anthrax							
Cutaneous	No	No	No	Yes for touching infective material	Pus	Duration of illness	
Inhalation	No	No	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions may be	Duration of illness	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Arthropodborne viral encephalitides (eastern equine, western equine, and Venezuelan equine encephalomyelitis, St. Louis and California encephalitis.)	No	No	No	No			
Arthropodborne viral fevers (dengue, yellow fever, and Colorado tick fever)	No	No	No	Yes for touching infective material	Blood	Duration of hospitalization	
Ascariasis	No	No	No	No			
Aspergillosis	No	No	No	No			
Babesiosis	No	No	No	Yes for touching infective material	Blood	Duration of illness	
Blastomycosis, North American, cutaneous or pulmonary	No	No	No	No			
Botulism							
Infant	No	No	No	No			
Other	No	No	No	No			
Bronchiolitis, etiology unknown in infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	Various etiologic agents, such as respiratory syncytial virus, parainfluenza viruses, adenoviruses, and influenza viruses, have been associated with this syndrome (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book); therefore, precautions to prevent their spread are generally indicated.
Bronchitis, infective etiology unknown							
Adults	No	No	No	No	Respiratory secretions may be		

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Bronchitis, infection etiology unknown (cont.)							
Infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	
Brucellosis (undulant fever, Malta fever, Mediterranean fever)							
Draining lesions, limited or minor	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Limited or minor = dressing covers and adequately contains the pus, or infected area is very small.
Other	No	No	No	No			
Burn wound (see separate section on Care of Patients with Burns)							
Campylobacter gastroenteritis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Candidiasis, all forms, including mucocutaneous (moniliasis, thrush)	No	No	No	No			
Cat-scratch fever (benign inoculation lymphoreticulosis)	No	No	No	No			
Cellulitis,							
Draining, limited or minor	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Limited or minor = dressing covers and adequately contains the pus, or infected area is very small.
Intact skin	No	No	No	No			
Chancroid (soft chancre)	No	No	No	No			
Chickenpox (varicella)	Yes	Yes	Yes	Yes	Respiratory secretions and lesion secretions	Until all lesions are crusted	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of room. Special ventilation for the room, if available, may be advantageous, especially for outbreak control. Neonates born to mothers with active vari-

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Chickenpox (cont.)							cella should be placed on isolation precautions at birth. Exposed susceptible patients should be placed on isolation precautions beginning 10 days after exposure and continuing until 21 days after last exposure. See CDC Guideline for Infection Control in Hospital Personnel for recommendations for exposed susceptible personnel.
Chlamydia trachomatis infection							
Conjunctivitis	No	No	No	Yes for touching infective material	Purulent exudate	Duration of illness	
Genital	No	No	No	Yes for touching infective material	Genital discharge	Duration of illness	
Respiratory	No	No	No	Yes for touching infective material	Respiratory secretions	Duration of illness	
Cholera	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Closed-cavity infection							
Draining, limited or minor	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Limited or minor = dressing covers and adequately contains the pus, or infected area is very small.
Not draining	No	No	No	No			
Clostridium perfringens							
Food poisoning	No	No	No	No			
Gas gangrene	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	
Other	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Coccidioidomycosis (valley fever)							
Draining lesions	No	No	No	No	Draining may be if spores form		
Pneumonia	No	No	No	No			
Colorado tick fever	No	No	No	Yes for touching infective material	Blood	Duration of hospitalization	
Common cold							
Adults	No	No	No	No	Respiratory secretions may be		
Infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	Although rhinoviruses are most frequently associated with the common cold and are mild in adults, severe infections may occur in infants and young children. Other etiologic agents, such as respiratory syncytial virus and parainfluenza viruses, may also cause this syndrome (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book); therefore, precautions to prevent their spread are generally indicated.
Congenital rubella	Yes	No	Yes if soiling is likely	Yes for touching infective material	Urine and respiratory secretions	During any admission for the 1st year after birth unless nasopharyngeal and urine cultures after 3 months of age are negative for rubella virus.	Susceptible persons should, if possible, stay out of room. Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel).
Conjunctivitis, acute bacterial (sore eye, pink eye)	No	No	No	Yes for touching infective material	Purulent exudate	Duration of illness	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Conjunctivitis, *Chlamydia*	No	No	No	Yes for touching infective material	Purulent exudate	Duration of illness	
Conjunctivitis, gonococcal							
Adults	No	No	No	Yes for touching infective material	Purulent exudate	For 24 hours after start of effective therapy	
Newborns	Yes	No	No	Yes for touching infective material	Purulent exudate	For 24 hours after start of effective therapy	
Conjunctivitis, viral and etiology unknown (acute hemorrhagic and swimming pool conjunctivitis)	Yes if patient hygiene is poor	No	No	Yes for touching infective material	Purulent exudate	Duration of illness	
Coronavirus infection, respiratory							
Adults	No	No	No	No	Respiratory secretions may be		
Infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	
Coxsackievirus disease	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces and respiratory secretions	For 7 days after onset	
Creutzfeldt-Jakob disease	No	No	No	Yes for touching infective material	Blood, brain tissue, and spinal fluid	Duration of hospitalization	Use caution when handling blood, brain tissue, or spinal fluid. (Jarvis WR. Precautions for Creutzfeldt-Jakob disease. Infect Control 1982; 3:238–9.)
Croup	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	Because viral agents, such as parainfluenza viruses and influenza A virus, have been associated with this syndrome (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book), precautions to prevent their spread are generally indicated.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Cryptococcosis	No	No	No	No			
Cysticercosis	No	No	No	No			
Cytomegalovirus infection, neonatal or immunosuppressed	No	No	No	No	Urine and respiratory secretions may be		Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel).
Decubitus ulcer, infected							
Draining, major	Yes	No	Yes if soiling is likely	Yes for touching infective mterial	Pus	Duration of illness	Major = draining and not covered by dressing or dressing does not adequately contain the pus.
Draining, minor	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small.
Dengue	No	No	No	Yes for touching infective material	Blood	Duration of hospitalization	
Diarrhea, acute—infective etiology suspected (see gastroenteritis)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Diphtheria							
Cutaneous	Yes	No	Yes if soiling is likely	Yes for touching infective material	Lesion secretions	Until 2 cultures from skin lesions, taken at least 24 hours apart after cessation of antimicrobial therapy, are negative for *Corynebacterium diphtheriae*	
Pharyngeal	Yes	Yes	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions	Until 2 cultures from both nose and throat taken at least 24 hours apart after cessation of antimicrobial therapy	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Diphtheria Pharyngeal (cont.)						are negative for *Corynebacterium diphtheriae*	
Echinococcosis (hydatidosis)	No	No	No	No			
Echovirus disease	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces and respiratory secretions	For 7 days after onset	
Eczema vaccination (vaccinia)	Yes	No	Yes if soiling is likely	Yes for touching infective material	Lesion secretions	Duration of illness	
Encephalitis or encephalomyelitis, etiology unknown, but infection suspected (see also specific etiologic agents; likely causes include enterovirus and arthropodborne virus infections)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness or 7 days after onset, whichever is less	Although specific etiologic agents can include enteroviruses, arthropodborne viruses, and herpes simplex, precautions for enteroviruses are generally indicated until a definitive diagnosis can be made.
Endometritis							
Group A *Streptococcus*	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Vaginal discharge	For 24 hours after start of effective therapy	
Other	No	No	Yes if soiling is likely	Yes for touching infective material	Vaginal discharge	Duration of illness	
Enterobiasis (pinworm disease, oxyuriasis)	No	No	No	No			
Enterocolitis (see also necrotizing enterocolitis)							
Clostridium difficile	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Staphylococcus	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Enteroviral infection	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	For 7 days after onset	
Epiglottitis, due to *Haemophilus influenzae*	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 24 hours after start of effective therapy	
Epstein-Barr virus infection, any, including infectious mononucleosis	No	No	No	No	Respiratory secretions may be		
Erysipeloid	No	No	No	No			
Erythema infectiosum	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 7 days after onset	
Escherichia coli gastroenteritis (enteropathogenic, enterotoxic, or enteroinvasive)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of hospitalization	
Fever of unknown origin (FUO)							Patients with FUO usually do not need isolation precautions; however, if a patient has signs and symptoms compatible with (and is likely to have) a disease that requires isolation precautions, use those isolation precautions for that patient.
Food poisoning							
Botulism	No	No	No	No			
Clostridium perfringens or *welchii* food poisoning)	No	No	No	No			
Salmonellosis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Staphylococcal food poisoning	No	No	No	No			

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Furunculosis—staphylococcal							
Newborns	Yes	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	During a nursery outbreak, cohorting of ill and colonized infants and use of gowns and gloves are recommended.
Others	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	
Gangrene							
Gas gangrene (due to any bacteria)	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	
Gastroenteritis							
Campylobacter species	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Clostridium difficile	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Cryptosporidium species	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Dientamoeba fragilis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Escherichia coli (entero-pathogenic, enterotoxic, or enteroinvasive)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Giardia lamblia	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Rotavirus	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness or 7 days after onset, whichever is less	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS: HOW LONG?	COMMENTS
Gastroenteritis (cont.)							
Salmonella species	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Shigella species	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Until 3 consecutive cultures of feces taken after ending antimicrobial therapy are negative for infecting strain	
Unknown etiology	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Vibrio parahaemolyticus	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Viral	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Yersiniá enterocolitica	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
German measles (rubella) (see also congential rubella)	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 7 days after onset of rash	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of room. Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel).
Giardiasis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Gonococcal ophthalmia neonatorum (gonorrheal ophthalmia, acute conjunctivitis of the newborn)	Yes	No	No	Yes for touching infective material	Purulent exudate	For 24 hours after start of effective therapy	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Gonorrhea	No	No	No	No	Discharge may be		
Granulocytopenia	No	No	No	No			Wash hands well *before* taking care of patient (see separate section on Care of Severely Compromised Patients).
Granuloma inguinale (donovaniasis, granuloma venereum)	No	No	No	No	Drainage may be		
Guillain-Barré syndrome	No	No	No	No			
Hand, foot, and mouth disease	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	For 7 days after onset	
Hemorrhagic fevers (for example, Lassa fever)	Yes with special ventilation	Yes	Yes	Yes	Blood, body fluids, and respiratory secretions	Duration of illness	Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Hepatitis, viral							
Type A (infectious)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces may be	For 7 days after onset of jaundice	Hepatitis A is most contagious before symptoms and jaundice appear; once these appear, small, inapparent amounts of feces, which may contaminate the hands of personnel during patient care, do not appear to be infective. Thus, gowns and gloves are most useful when gross soiling with feces is anticipated or possible.
Type B ("serum hepatitis"), including hepatitis B antigen (HBsAg) carrier	No	No	Yes if soiling is likely	Yes for touching infective material	Blood and body fluids	Until patient is HBsAg-negative	Use caution when handling blood and blood-soiled articles. Take special care to avoid needlestick injuries. Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel). Gowns are indicated when clothing may become contaminated with body fluids or blood

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Hepatitis, viral Type B (cont.)							(for example, when blood splattering is anticipated). If gastrointestinal bleeding is likely, wear gloves if touching feces. A private room may be indicated if profuse bleeding is likely to cause environmental contamination.
Non-A, Non-B	No	No	Yes if soiling is likely	Yes for touching infective material	Blood and body fluids	Duration of illness	Currently, the period of infectivity cannot be determined.
Unspecified type, consistent with viral etiology							Maintain precautions indicated for the infections that are most likely.
Herpangina	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	For 7 days after onset	
Herpes simplex (*Herpesvirus hominis*)							
Encephalitis	No	No	No	No			
Mucocutaneous, disseminated or primary, severe (skin, oral, and genital)	Yes	No	Yes if soiling is likely	Yes for touching infective material	Lesion secretions from infected site	Duration of illness	
Mucocutaneous, recurrent (skin, oral, and genital)	No	No	No	Yes for touching infective material	Lesion secretions from infected site	Until all lesions are crusted	
Neonatal (see comments for newborn with perinatal exposure)	Yes	No	Yes if soiling is likely	Yes for touching infective material	Lesion secretions	Duration of illness	The same isolation precautions are indicated for infants delivered (either vaginally or by cesarean section if membranes have been ruptured for more than 4–6 hours) to women with active genital herpes simplex infections. Infants delivered by cesarean section to women with active genital herpes simplex infections before and probably within 4–6 hours after membrane rupture are at minimal risk of develop-

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Herpes simplex Neonatal (cont.)							ing herpes simplex infection; the same isolation precautions may still be indicated, however. (American Academy of Pediatrics Committee on Fetus and Newborn. Perinatal herpes simplex virus infections. Pediatrics 1980; 66:147–9. Also: Kibrick S, Herpes simplex infection at term. JAMA 1980;243:157–60.)
Herpes zoster (varicella-zoster),							
Localized in immunocompromised patient, or disseminated	Yes	Yes	Yes	Yes for touching infective material	Lesion secretions and possibly respiratory secretions	Duration of illness	Localized lesions in immunocompromised patients frequently become disseminated. Because such dissemination is unpredictable, use the same isolation precautions as for disseminated disease. Persons who are not susceptible do not need to wear a mask. Persons susceptible to varicella-zoster (chickenpox) should, if possible, stay out of room. Special ventilation for the room, if available, may be advantageous, especially for outbreak control. Exposed susceptible patients should be placed on isolation precautions beginning at 10 days after exposure and continuing until 21 days after last exposure. See CDC Guideline for Infection Control in Hospital Personnel for recommendations for exposed susceptible personnel.
Localized in normal patient	Yes if patient hygiene is poor	No	No	Yes for touching infective material	Lesion secretions	Until all lesions are crusted	Persons susceptible to varicella-zoster (chickenpox) should, if possible, stay out of room. Roommates should not be susceptible to chickenpox.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Histoplasmosis at any site	No	No	No	No			
Hookworm disease (ancylostomiasis, uncinariasis)	No	No	No	No			
Immunocompromised status	No	No	No	No			Wash hands well *before* taking care of patients (see separate section on Care of Severely Compromised Patients).
Impetigo	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Lesions	For 24 hours after start of effective therapy	
Infectious mononucleosis	No	No	No	No	Respiratory secretions may be		
Influenza							
Adults	No	No	No	No	Respiratory secretions may be		In the absence of an epidemic, influenza may be difficult to diagnose on clinical grounds. Most patients will have fully recovered by the time laboratory diagnosis is established; therefore, placing patients with suspect influenza on isolation precautions, although theoretically desirable, is simply not practical in most hospitals. During epidemics, the accuracy of clinical diagnosis increases, and patients believed to have influenza may be place in the same room (cohorting). Amantadine prophylaxis may be useful to prevent symptomatic influenza A infections in high-risk patients during epidemics.
Infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	In the absence of an epidemic, influenza may be difficult to diagnose. During epidemics, patients believed to have influenza may be placed in the same room (cohorting).

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Jakob-Creutzfeldt disease	No	No	No	Yes for touching infective material	Blood, brain tissue, and spinal fluid	Duration of hospitalization	Use caution when handling blood, brain tissue, or spinal fluid. (Jarvis WR, Precautions for Creutzfeldt-Jakob disease. Infect Control 1982; 3:238–9.)
Kawasaki syndrome	No	No	No	No			
Keratoconjunctivitis, infective	Yes if patient hygiene is poor	No	No	Yes for touching infective material	Purulent exudate	Duration of illness	
Lassa fever	Yes with special ventilation	Yes	Yes	Yes	Blood, body fluids, and respiratory secretions	Duration of illness	Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Legionnaires' disease	No	No	No	No	Respiratory secretions may be		
Leprosy	No	No	No	No			
Leptospirosis	No	No	No	Yes for touching infective material	Blood and urine	Duration of hospitalization	
Listeriosis	No	No	No	No			
Lyme disease	No	No	No	No			
Lymphocytic choriomengitis	No	No	No	No			
Lymphogranuloma venereum	No	No	No	No	Drainage may be		
Malaria	No	No	No	Yes for touching infective material	Blood	Duration of illness	
Marburg virus disease	Yes with special ventilation	Yes	Yes	Yes	Blood, body fluids, and respiratory secretions	Duration of illness	Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Measles (rubeola) all presentations	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 4 days after start of rash, except in immunocompromised patients with whom precautions should be maintained for duration of illness	Persons who are not susceptible do not need to wear mask. Susceptible persons should, if possible, stay out of room.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Melioidosis, all forms	No	No	No	No	Respiratory secretions may be, and, if a sinus is draining, drainage may be		
Meningitis							
Aseptic (nonbacterial or viral meningitis) (also see specific etiologies)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	For 7 days after onset	Enteroviruses are the most common cause of aseptic meningitis.
Bacterial, gram-negative enteric, in neonates	No	No	No	No	Feces may be		During a nursery outbreak, cohort ill and colonized infants, and use gowns if soiling is likely and gloves if touching feces.
Fungal	No	No	No	No			
Haemophilus influenzae, known or suspected	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 24 hours after start of effective therapy	
Listeria monocytogenes	No	No	No	No			
Neisseria meningitidis (meningococcal), known or suspected	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 24 hours after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Pneumococcal	No	No	No	No			
Tuberculous	No	No	No	No			Patient should be examined for evidence of current (active) pulmonary tuberculosis. If present, precautions are necessary (see tuberculosis).
Other diagnosed bacterial	No	No	No	No			
Meningococcal pneumonia	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 24 hours after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Meningococcemia (meningococcal sepsis)	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 24 hours after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Molluscum contagiosum	No	No	No	No			
Mucormycosis	No	No	No	No			
Multiply-resistant organisms,* infection or colonization.†							
Gastrointestinal	Yes	No	Yes if soiling is likely	Yes for touching infective material	Feces	Until off antimicrobials and culture-negative	In outbreaks, cohorting of infected and colonized patients may be indicated if private rooms are not available.
Respiratory	Yes	Yes for those close to patient	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions and possibly feces	Until off antimicrobials and culture-negative	In outbreaks, cohorting of infected and colonized patients may be indicated if private rooms are not available.
Skin, Wound, or Burn	Yes	No	Yes if soiling is likely	Yes for touching infective material	Pus and possibly feces	Until off antimicrobials and culture-negative	In outbreaks, cohorting of infected and colonized patients may be indicated if private rooms are not available
Urinary	Yes	No	No	Yes for touching infective material	Urine and possibly feces	Until off antimicrobials and culture-negative	Urine and urine-measuring devices are sources of infection, especially if the patient (or any nearby patients) has indwelling urinary catheter. In outbreaks, cohorting of infected and colonized patients may be indicated if private rooms are not available.
Mumps (infectious parotitis)	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 9 days after onset of swelling	Persons who are not susceptible do not need to wear mask.

*The following multiply-resistant organisms are included:
1) Gram-negative bacilli resistant to all aminoglycosides that are tested. (In general, such organisms should be resistant to gentamicin, tobramycin, and amikacin for these special precautions to be indicated.)
2) *Staphylococcus aureus* resistant to methicillin (or nafcillin or oxacillin if they are used instead of methicillin for testing).
3) *Pneumococcus* resistant to penicillin.
4) *Haemophilus influenzae* resistant to ampicillin (beta-lactamase positive) and chloramphenicol.
5) Other resistant bacteria may be included if they are judged by the infection control team to be of special clinical and epidemiologic significance.

†Colonization may involve more than 1 site.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS: HOW LONG?	COMMENTS
Mycobacteria, nontuberculous (atypical)							
Pulmonary	No	No	No	No			
Wound	No	No	Yes if soiling is likely	Yes for touching infective material	Drainage may be	Duration of drainage	
Mycoplasma pneumonia	No	No	No	No	Respiratory secretions may be		A private room may be indicated for children.
Necrotizing enterocolitis	No	No	Yes if soiling is likely	Yes for touching infective material	Feces may be	Duration of illness	In nurseries, cohorting of ill infants is recommended. It is not known whether or how this disease is transmitted; nevertheless, gowns are recommended if soiling is likely, and gloves are recommended for touching feces.
Neutropenia	No	No	No	No			Wash hands well *before* taking care of patient (see separate section on Care of Severely Compromised Patients).
Nocardiosis							
Draining lesions	No	No	No	No	Drainage may be		
Other	No	No	No	No			
Norwalk agent gastroenteritis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Orf	No	No	No	No	Drainage may be		
Parainfluenza virus infection, respiratory in infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	During epidemics, patients believed to have parainfluenza virus infection may be placed in the same room (cohorting).
Pediculosis	Yes if patient hygiene is poor	No	Yes for close contact	Yes for close contact	Infested area	For 24 hours after start of effective therapy	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Pertussis ("whooping cough")	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 7 days after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Pharyngitis, infective, etiology unknown							
Adults	No	No	No	No	Respiratory secretions may be		
Infants and young children	Yes if patient hygiene is poor	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	Because adenoviruses, influenza viruses, and parainfluenza viruses have been associated with this syndrome (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book), precautions to prevent their spread are generally indicated.
Pinworm infection	No	No	No	No			
Plague							
Bubonic	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	For 3 days after start of effective therapy	
Pneumonic	Yes	Yes	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions	For 3 days after start of effective therapy	
Pleurodynia	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	For 7 days after onset	Enteroviruses frequently cause infection.
Pneumonia							
Bacterial not listed elsewhere (including gram-negative bacterial)	No	No	No	No	Respiratory secretions may be		
Chlamydia	No	No	No	Yes for touching infective material	Respiratory secretions	Duration of illness	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Pneumonia (cont.)							
Etiology unknown							Maintain precautions indicated for the etiology that is most likely.
Fungal	No	No	No	No			
Haemophilus influenzae							
Adults	No	No	No	No	Respiratory secretions may be		
Infants and children (any age)	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 24 hours after start of effective therapy	
Legionnella	No	No	No	No	Respiratory secretions may be		
Meningococcal	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 24 hours after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Multiply-resistant bacterial	Yes	Yes for those close to patient	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions and possibly feces	Until off antimicrobials and culture-negative	In outbreaks, cohorting of infected and colonized patients may be necessary if private rooms are not available.
Mycoplasma (primary atypical pneumonia, Eaton agent pneumonia)	No	No	No	No	Respiratory secretions may be		A private room may be useful for children
Pneumococcal	No	No	No	No	Respiratory secretions may be for 24 hours after start of effective therapy		
Pneumocystis carinii	No	No	No	No			
Staphylococcus aureus	Yes	Yes for those close to patient	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions	For 48 hours after start of effective therapy	
Streptococcus, group A	Yes	Yes for those close to patient	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions	For 24 hours after start of effective therapy	

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Pneumonia (cont.)							
Viral (see also specific etiologic agents)							
Adults	No	No	No	No	Respiratory secretions may be		
Viral Infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	Viral pneumonia may be caused by various etiologic agents, such as parainfluenza viruses, influenza viruses, and, particularly, respiratory syncytial virus, in children less than 5 years old (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book); therefore, precautions to prevent their spread are generally indicated.
Poliomyelitis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	For 7 days after onset	
Psittacosis (ornithosis)	No	No	No	No	Respiratory secretions may be		
Q fever	No	No	No	No	Respiratory secretions may be		
Rabies	Yes	Yes for those close to patient	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions	Duration of illness	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Rat-bite fever (*Streptobacillus moniliformis* disease, *Spirillum minus* disease)	No	No	No	Yes for touching infective material	Blood	For 24 hours after start of effective therapy	
Relapsing fever	No	No	No	Yes for touching infective material	Blood	Duration of illness	
Resistant bacterial (see multiply-resistant bacteria)							

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Respiratory infectious disease, acute (if not covered elsewhere)							
Adults	No	No	No	No	Respiratory secretions may be		
Infants and young children							Maintain precautions indicated for the bacterial or viral infections that are most likely.
Respiratory syncytial virus (RSV) infection, in infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	During epidemics, patients believed to have RSV infection may be placed in the same room (cohorting). The use of masks has not been recommended since they have proven ineffective in controlled studies.
Reye syndrome	No	No	No	No			
Rheumatic fever	No	No	No	No			
Rhinovirus infection, respiratory							
Adults	No	No	No	No	Respiratory secretions may be		
Infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	
Rickettsial fevers, tickborne (Rocky Mountain spotted fever, tickborne typhus fever)	No	No	No	No	Blood may be		
Rickettsialpox (vesicular rickettsiosis)	No	No	No	No			
Ringworm (dermatophytosis, dermatomycosis, tinea)	No	No	No	No			
Ritter's disease (staphylococcal scalded skin syndrome)	Yes	No	Yes if soiling is likely	Yes for touching infective material	Lesion drainage	Duration of illness	
Rocky Mountain spotted fever	No	No	No	No	Blood may be		

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Roseola infantum (exanthem subitum)	No	No	No	No			
Rotavirus infection (viral gastroenteritis)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness or 7 days after onset, whichever is less	
Rubella (''German measles'') (see also congential rubella)	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 7 days after onset of rash	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of room. Pregnant personnel may need special counseling (see CDC Guideline for Infection Control in Hospital Personnel).
Salmonellosis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Scabies	Yes if patient hygiene is poor	No	Yes for close contact	Yes for close contact	Infested area	For 24 hours after start of effective therapy	
Scalded skin syndrome, staphylococcal (Ritter's disease)	Yes	No	Yes if soiling is likely	Yes for touching infective material	Lesion drainage	Duration of illness	
Schistosomiasis (bilharziasis)	No	No	No	No			
Shigellosis (including bacillary dysentery)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Until 3 consecutive cultures of feces, taken after ending antimicrobial therapy, are negative for infecting strain	
Smallpox (variola)	Yes with special ventilation	Yes	Yes	Yes	Respiratory secretions and lesion secretions	Duration of illness	As long as smallpox virus is kept stocked in laboratories, the potential exists for cases to occur. Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Sporotrichosis	No	No	No	No			
Spirillium minus disease (rat-bite fever)	No	No	No	Yes for touching infective material	Blood	For 24 hours after start of effective therapy	
Staphylococcal disease (*S. aureus*)							
Skin, wound, or burn infection							
Major	Yes	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Major = draining and not covered by dressing or dressing does not adequately contain the pus.
Minor or limited	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small.
Enterocolitis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Pneumonia or draining lung abscess	Yes	Yes for those close to patient	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions	For 48 hours after start of effective therapy	
Scalded skin syndrome	Yes	No	Yes if soiling is likely	Yes for touching infective material	Lesion drainage	Duration of illness	
Toxic shock syndrome	No	No	Yes if soiling is likely	Yes for touching infective material	Vaginal discharge or pus	Duration of illness	
Streptobacillus moniliformis disease (rat-bite fever)	No	No	No	Yes for touching infective material	Blood	For 24 hours after start of effective therapy	
Streptococcal disease (group A *Streptococcus*)							
Skin, wound, or burn infection							
Major	Yes	No	Yes if soiling is likely	Yes for touching infective material	Pus	For 24 hours after start of effective therapy	Major = draining and not covered by dressing or dressing does not adequately contain the pus.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Streptococcal disease (group A—cont.)							
Minor or limited	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	For 24 hours after start of effective therapy	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small.
Endometritis (puerperal sepsis)	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Vaginal discharge	For 24 hours after start of effective therapy	
Pharyngitis	Yes if patient hygiene is poor	No	No	No	Respiratory secretions	For 24 hours after start of effective therapy	
Pneumonia	Yes	Yes for those close to patient	Yes if soiling is likely	Yes for touching infective material	Respiratory secretions	For 24 hours after start of effective therapy	
Scarlet fever	Yes if patient hygiene is poor	No	No	No	Respiratory secretions	For 24 hours after start of effective therapy	
Streptococcal disease (group B *Streptococcus*), neonatal	No	No	No	No	Feces may be		During a nursery outbreak, cohorting of ill and colonized infants and use of gowns and gloves is recommended.
Streptococcal disease (not group A or B) unless covered elsewhere	No	No	No	No			
Strongyloidiasis	No	No	No	No	Feces may be		If the patient is immunocompromised and has pneumonia or has disseminated disease, respiratory secretions may be infective.
Syphilis							
Skin and mucous membrane, including congenital, primary, and secondary	No	No	No	Yes for touching infective material	Lesion secretions and blood	For 24 hours after start of effective therapy	Skin lesions of primary and secondary syphilis may be highly infective.
Latent (tertiary) and seropositivity without lesions	No	No	No	No			

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Tapeworm disease							
Hymenolepis nana	No	No	No	No	Feces may be		
Taenia solium (pork)	No	No	No	No	Feces may be		
Other	No	No	No	No			
Tetanus	No	No	No	No			
Tinea (fungus infection dermatophytosis, dermatomycosis, ringworm)	No	No	No	No			
"TORCH" syndrome (If congenital forms of the following diseases are seriously being considered, see separate listing for these diseases: toxoplasmosis, rubella, cytomegalovirus, herpes, and syphilis.)							
Toxoplasmosis	No	No	No	No			
Toxic shock syndrome (staphylococcal disease)	No	No	Yes if soiling is likely	Yes for touching infective material	Vaginal discharge and pus	Duration of illness	
Trachoma, acute	No	No	No	Yes for touching infective material	Purulent exudate	Duration of illness	
Trench mouth (Vincent's angina)	No	No	No	No			
Trichinosis	No	No	No	No			
Trichomoniasis	No	No	No	No			
Trichuriasis (whipworm disease)	No	No	No	No			
Tuberculosis							
Extrapulmonary, draining lesion (including scrofula)	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of drainage	A private room is especially important for children.
Extrapulmonary, meningitis	No	No	No	No			

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Tuberculosis (cont.)							
Pulmonary, confirmed or suspected (sputum smear is positive or chest X-ray appearance strongly suggests current [active] TB, for example, a cavitary lesion is found), or laryngeal disease.	Yes with special ventilation	Yes if patient is coughing and does not reliably cover mouth	Yes if gross contamination of clothing is likely	No	Airborne droplet nuclei	In most instances the duration of isolation precautions can be guided by clinical response and a reduction in numbers of TB organisms on sputum smear. Usually this occurs within 2–3 weeks after chemotherapy is begun. When the patient is likely to be infected with isoniazid-resistant organisms, apply precautions until patient is improving and sputum smear is negative for TB organisms.	Prompt use of effective antituberculous drugs is the most effective means of limiting transmission. Gowns are not important because TB is rarely spread by fomites, although gowns are indicated to prevent gross contamination of clothing. For more detailed guidelines refer to "Guidelines for Prevention of TB Transmission in Hospitals" (1982), Tuberculosis Control Division, Center for Prevention Services, Centers for Disease Control, Atlanta, GA, (HHS Publication No. [CDC] 82-8371) and CDC Guideline for Infection Control in Hospital Personnel. In general, infants and young children do not require isolation precautions because they rarely cough and their bronchial secretions contain few TB organisms compared to adults with pulmonary TB.
Skin-test positive with no evidence of current pulmonary disease (sputum smear is negative, X-ray not suggestive of current [active] disease)	No	No	No	No			
Tularemia							
Draining lesion	No	No	Yes if soiling is likely	Yes for touching infective material	Pus may be	Duration of illness	
Pulmonary	No	No	No	No	Respiratory secretions may be		

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Typhoid fever	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Typhus, endemic and epidemic	No	No	No	No	Blood may be		
Urinary tract infection (including pyelonephritis), with or without urinary catheter	No	No	No	No			See multiply-resistant bacteria if infection is with these bacteria. Spatially separate infected and uninfected patients who have indwelling catheters (see CDC Guideline for Prevention of Catheter-associated Urinary Tract Infection).
Vaccinia							
At vaccination site	No	No	Yes if soiling is likely	Yes for touching infective material	Lesion secretions	Duration of illness	
Generalized and progressive, eczema vaccinatum	Yes	No	Yes if soiling is likely	Yes for touching infective material	Lesion secretions	Duration of illness	
Varicella (chickenpox)	Yes	Yes	Yes	Yes	Respiratory secretions and lesion secretions	Until all lesions are crusted	Persons who are not susceptible do not need to wear a mask. Susceptible persons should, if possible, stay out of the room. Special ventilation for the room, if available, may be advantageous, especially for outbreak control. Neonates born to mothers with active varicella should be placed on isolation precautions at birth. Exposed susceptible patients should be placed on isolation precautions beginning 10 days after exposure and continuing until 21 days after last exposure. See CDC Guideline for Infection Control in Hospital Personnel for recommendations for exposed susceptible personnel.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Variola (smallpox)	Yes with special ventilation	Yes	Yes	Yes	Respiratory secretions and lesion secretions	Duration of illness	Call the State Health Department and Centers for Disease Control for advice about management of a suspected case.
Vibrio parahaemolyticus gastroenteritis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Vincent's angina (trench mouth)	No	No	No	No			
Viral diseases							
Pericarditis, myocarditis, or meningitis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces and possibly respiratory secretions	For 7 days after onset	Enteroviruses frequently cause these infections.
Respiratory (if not covered elsewhere)							
Adults	No	No	No	No	Respiratory secretions may be		
Infants and young children	Yes	No	Yes if soiling is likely	No	Respiratory secretions	Duration of illness	Various etiologic agents, such as respiratory syncytial virus, parainfluenza viruses, adenoviruses, and, influenza viruses, can cause viral respiratory infections (Committee on Infectious Diseases, American Academy of Pediatrics. 1982 Red Book); therefore, precautions to prevent their spread are generally indicated.
Whooping cough (pertussis)	Yes	Yes for those close to patient	No	No	Respiratory secretions	For 7 days after start of effective therapy	See CDC Guideline for Infection Control in Hospital Personnel for recommendations for prophylaxis after exposure.
Wound infections							
Major	Yes	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Major = draining and not covered by dressing or dressing does not adequately contain the pus.

Table B. Disease-specific Isolation Precautions

DISEASE	PRECAUTIONS INDICATED: PRIVATE ROOM?	MASKS?	GOWNS?	GLOVES?	INFECTIVE MATERIAL	APPLY PRECAUTIONS HOW LONG?	COMMENTS
Wound infections (cont.)							
Minor or limited	No	No	Yes if soiling is likely	Yes for touching infective material	Pus	Duration of illness	Minor or limited = dressing covers and adequately contains the pus, or infected area is very small, such as a stitch abscess.
Yersinia enterocolitica gastroenteritis	Yes if patient hygiene is poor	No	Yes if soiling is likely	Yes for touching infective material	Feces	Duration of illness	
Zoster (varicella-zoster),							
Localized in immunocompromised patient or disseminated	Yes	Yes	Yes	Yes for touching infective material	Lesion secretions	Duration of illness	Localized lesions in immunocompromised patients frequently become disseminated. Because such dissemination is unpredictable, use the same isolation precautions as with disseminated disease. Persons who are not susceptible do not need to wear a mask. Persons susceptible to varicella-zoster (chickenpox) should, if possible, stay out of the room. Special ventilation for room, if available, may be advantageous, especially for outbreak control. Exposed susceptible patients should be placed on isolation precautions beginning 10 days after exposure and continuing until 21 days after last exposure. See CDC Guideline for Infection Control in Hospital Personnel for recommendations for exposed susceptible personnel.
Localized in normal patient	Yes if patient hygiene is poor	No	No	Yes for touching infective material	Lesion secretions	Until all lesions are crusted	Persons susceptible to varicella-zoster (chickenpox) should, if possible, stay out of room. Roommates should not be susceptible to chickenpox.
Zygomycosis (phycomycosis, mucormycosis)	No	No	No	No			

Instruction Card for Disease-Specific Isolation Precautions

An instruction card has been designed to give concise information about disease-specific isolation precautions, and a sample is shown below. The specific isolation precautions indicated for each disease or syndrome are listed in Table B, Disease-Specific Isolation Precautions. The instruction card can be prepared by checking items and filling in blanks. After the card has been prepared, it should be displayed conspicuously near the patient who is on isolation precautions (on the door, foot or head of bed, etc.). A duplicate card may also be attached to the front of the patient's chart.

Sample Instruction Card for Disease-Specific Isolation Precautions

(Front of Card)

Visitors—Report to Nurses' Station Before Entering Room

1. **Private room indicated?**
   _____ No
   _____ Yes
2. **Masks indicated?**
   _____ No
   _____ Yes for those close to patient
   _____ Yes for all persons entering room
3. **Gowns indicated?**
   _____ No
   _____ Yes if soiling is likely
   _____ Yes for all persons entering room
4. **Gloves indicated?**
   _____ No
   _____ Yes for touching infective material
   _____ Yes for all persons entering room
5. Special precautions indicated for handling blood?
   _____ No
   _____ Yes
6. **Hands must be washed after touching the patient or potentially contaminated articles and before taking care of another patient.**
7. Articles contaminated with _____ (infective material(s)) should be discarded or bagged and labeled before being sent for decontamination and reprocessing.

(Back of Card)

Instructions

1. On Table B, Disease-Specific Precautions, locate the disease for which isolation precautions are indicated.
2. Write disease in blank space here: _____
3. Determine if a private room is indicated. In general, patients infected with the same organism may share a room. For some diseases or conditions, a private room is indicated if patient hygiene is poor. A patient with poor hygiene does not wash hands after touching infective material (feces, purulent drainage, or secretions), contaminates the environment with infective material, or shares contaminated articles with other patients.
4. Place a check mark beside the indicated precautions on front of card.
5. Cross through precautions that are *not* indicated.
6. Write infective material in blank space in item 7 on front of card.

SECTION 4: MODIFICATION OF ISOLATION PRECAUTIONS

MODIFICATION OF ISOLATION PRECAUTIONS IN INTENSIVE CARE UNITS

Patients requiring intensive care are usually at higher risk than other patients of becoming colonized or infected with organisms of special clinical or epidemiologic significance. Three reasons are that contacts between these patients and personnel are frequent, the patients are clustered in a confined area, and many of them are unusually susceptible to infection. Moreover, critically ill patients are more likely to have multiple invasive procedures performed on them. Because there is ample opportunity for cross-infection in the Intensive Care Unit (ICU), infection control precautions must be done scrupulously. Frequent in-service training and close supervision to ensure adequate application of infection control and isolation precautions are particularly important for ICU personnel. (See Guideline for Hospital Environmental Control: Intensive Care Units.)

Most ICUs pose special problems for applying isolation precautions, hence some modifications that will neither compromise patient care nor increase the risk of infection to other patients or personnel may be necessary. The isolation precaution that will most often have to be modified is the use of a private room. Ideally, private rooms should be available in ICUs, but some ICUs do not have them or do not use them for patients who are critically ill if frequent and easy accessibility by personnel is crucial. When a private room is not available or is not desirable because of the patient's critical condition, and if airborne transmission is *not* likely, an isolation area can be defined within the ICU by curtains, partitions, or an area marked off on the floor with tape. Instructional cards can be posted to inform personnel and visitors about the isolation precautions in use.

Patients with infections that can cause serious illness (for example, chickenpox) if transmitted in hospitals, should be put in a private room even when the ICU does not have one. Because the risk of these highly contagious or virulent infections to patients and personnel is great, the inconvenience and expense associated with intensive care in a private room outside the ICU must be accepted.

One isolation precaution that should never be modified in intensive care units is frequent and appropriate handwashing. Hands should be washed between patients and may need to be washed several times during the care of a patient so that microorganisms are not transmitted from 1 site to another on the same patient; for example, from urinary tract to wound. Antiseptics, rather than soap, should be considered for handwashing in intensive care units. (See Guideline for Hospital Environmental Control: Antiseptics, Handwashing, and Handwashing Facilities.)

MODIFICATION OF ISOLATION PRECAUTIONS FOR NEWBORNS AND INFANTS

Isolation precautions for newborns and infants may have to be modified from those recommended for adults because 1) usually only a small number of private rooms are available for newborns and infants, and 2) during outbreaks, it is frequently necessary to establish cohorts of newborns and infants. Moreover, a newborn may need to be placed on isolation precautions at delivery because its mother has an infection.

It has often been recommended that infected newborns or those suspected of being infected (regardless of the pathogen and clinical manifestations) should be put in a private room. This recommendation was based on the assumptions that a geographically isolated room was necessary to protect uninfected newborns and that infected newborns would receive closer scrutiny and better care in such a room. Neither of these assumptions is completely correct.

Separate isolation rooms are seldom indicated for newborns with many kinds of infection if the following conditions are met: 1) an adequate number of nursing and medical personnel are on duty and have sufficient time for appropriate handwashing, 2) sufficient space is available for a 4- to 6-foot aisle or area between newborn stations, 3) an adequate number of sinks for handwashing are available in each nursery room or area, and 4) continuing instruction is given to personnel about the mode of transmission of infections. When these criteria are not met, a separate room with handwashing facilities may be indicated.

Another incorrect assumption regarding isolation precautions for newborns and infants is that forced-air incubators can be substituted for private rooms. These incubators may filter the incoming air but not the air discharged into the nursery. Moreover, the surfaces of incubators housing newborns or infants can easily become contaminated with organisms infecting or colonizing the patient, so personnel working with the patient through portholes may have their hands and forearms colonized. Forced-air incubators, therefore, are satisfactory for limited "protective" isolation of newborns and infants but should not be relied on as a major means of preventing transmission from infected patients to others.

Isolation precautions for an infected or colonized newborn or infant, or for a newborn of a mother suspected of having an infectious disease can be determined by the specific viral or bacterial pathogen, the clinical manifestations, the source and possible modes of transmission, and the number of colonized or infected newborns or infants. Other factors to be considered include the overall condition of the newborn or infant and the kind of care required, the available space and facilities, the nurse-to-patient ratio, and the size and type of nursery services for newborns and infants.

In addition to applying isolation precautions, cohorts may be established to keep to a minimum the transmission of organisms or infectious diseases among different groups of newborns and infants in large nurseries. A cohort usually consists of all well newborns from the same 24- or 48-hour birth period; these newborns are admitted to and kept in a single nursery room and, ideally, are taken care of by a single group of personnel who do not take care of any other cohort during the same shift. After the newborns in a cohort have been discharged, the room is thoroughly cleaned and prepared to accept the next cohort.

Cohorting is not practical as a routine for small nurseries or in neonatal intensive care units or graded care nurseries. It is useful in these nurseries, however, as a control measure during outbreaks or for managing a group of infants or newborns colonized or infected with an epidemiologically important pathogen. Under these circumstances, having separate rooms for each cohort is ideal, but not mandatory for many kinds of infections if cohorts can be kept separate within a single large room and if personnel are assigned to take care of only those in the cohort.

During outbreaks, newborns or infants with overt infection or colonization and personnel who are carriers, if indicated, should be identified rapidly and placed in cohorts; if rapid identification is not possible, exposed newborns or infants should be placed in a cohort separate from those with disease and from unexposed infants and newborns and new admissions. The success of cohorting depends largely on the willingness and ability of nursing and ancillary personnel to adhere strictly to the cohort system and to meticulously follow patient-care practices.

CARE OF SEVERELY COMPROMISED PATIENTS

Patients with certain diseases (for example, leukemia, cancer, and extensive skin conditions, such as severe burns or dermatitis) and patients who are receiving certain therapeutic regimens (for example, total body irradiation, steroid or antimetabolite therapy) are highly susceptible to infection. These compromised patients are often on special "protective" patient-care regimens intended to reduce the risk of infection. One such regimen, Protective Isolation (as outlined in the previous editions of *Isolation Techniques for Use in Hospitals*), does not appear to reduce this risk any more than strong emphasis on appropriate handwashing during patient care.

Protective isolation, as previously outlined, may fail to reduce the risk of infection because compromised patients are often infected by their own (endogenous) microorganisms or are colonized and infected by microorganisms transmitted by the inadequately washed hands of personnel or by nonsterile items used in routine protective isolation. Such items may include patient-care equipment, food, water, and air. Some studies suggest that vigorous efforts to exclude all microorganisms by using patient-isolator units, eradicating endogenous flora, and sterilizing food, water, and fomites may prevent or delay onset of some infections; thus, these procedures have been recommended by some for use with very-high-risk patients who have a predictable temporary period of high susceptibility. However, these extraordinary and expensive precautions do not appear warranted for most compromised patients.

In general, compromised patients should be taken care of by using precautions that are no different from routine good patient-care techniques, but for these patients, routine techniques must be emphasized and enforced. All personnel must frequently and appropriately wash their hands before, during, and after patient care. Compromised patients should be kept separate from patients who are infected or have conditions that make infection transmission likely. They should be put in private rooms whenever possible.

CARE OF PATIENTS WITH BURNS

Burn wounds have been classified as major or minor by various investigators according to several risk factors for burn-associated complications. We have considered only the infectious complications of burns. Therefore, we have classified major burn wounds as those that cannot effectively be covered or whose drainage cannot effectively be contained by use of dressings. The drainage from a minor burn can be covered and contained by dressings.

Most major burn wounds and many minor ones have become infected by the second or third day after the burn occurs. Care of burn patients, therefore, involves efforts to prevent colonization and infection of the wound, and isolation precautions to prevent transmission to other patients. Other important methods of care include use of topical and systemic antimicrobials, vaccines, and general supportive measures.

It is beyond the scope of this guideline to present comprehensive infection control recommendations for taking care of patients with burns. We have, however, made recommendations for isolation precautions for both major and minor burns infected with various pathogens. Rather than listing burn wounds separately, we have grouped them under the subheading "skin, wound, or burn infection."

Isolation precautions and infection control techniques for major burn wounds vary among burn centers. These precautions may involve the use of strictly enforced, frequent handwashing, sterile gowns, sterile gloves, and masks. Since it is not possible to "isolate" a major wound by use of dressings, a private room or a special burn center is indicated for such patients. (American College of Surgeons. Total care for burn patients: a guide to hospital resources. Bull Am Coll Surgeons 1977; 62:6–14.)

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Guideline for Infection Control in Hospital Personnel

Written by Walter W. Williams, MD, MPH
Hospital Infections Program
Center for Infectious Diseases
Centers for Disease Control
Atlanta, Georgia

WORKING GROUP
Dennis Brimhall
Associate Administrator
University of Utah Hospital
Salt Lake City, Utah

E. Patchen Dellinger, MD
Associate Professor of Surgery
Harborview Medical Center
Seattle, Washington

Donald A. Goldmann, MD
Hospital Epidemiologist
Division of Infectious Diseases
The Children's Hospital Medical Center
Boston, Massachusetts

Douglas C. Hubner, MD
Hospital Epidemiologist
Hillcrest Medical Center
Tulsa, Oklahoma

Marguerite M. Jackson, RN, MS
Coordinator
Infection Control Team
University of California Medical Center
San Diego, California

C. Glen Mayhall, MD
Division of Infectious Diseases
Medical College of Virginia
Richmond, Virginia

Emily Rhinehart Smith, RN
Nurse Epidemiologist
Cleveland Clinic Foundation
Cleveland, Ohio

Joyce L. Safian, RN, FNP, MA
President
North Bay Corporate Health Services, Inc.
Santa Rosa, California

William M. Valenti, MD
Hospital Epidemiologist
University of Rochester Medical Center
Strong Memorial Hospital
Rochester, New York

Catherine M. Wilfert, MD
Professor of Pediatrics and Microbiology
Duke University Medical Center
Durham, North Carolina

*The Guidelines may be purchased from the
National Technical Information Service at this address:

National Technical Information Service (NTIS)
U.S. Department of Commerce
5285 Port Royal Road
Springfield, Virginia 22161
Telephone: (703) 487-4650

Contributors from the
Hospital Infections Program, Center for Infectious Diseases, Centers for Disease Control

Robert W. Haley, MD
Director

T. Grace Emori, RN, MS
Nurse Epidemiologist
Surveillance and Prevention Branch

Julia S. Garner, RN, MN
Assistant Chief
Surveillance and Prevention Branch

James M. Hughes, MD
Assistant Director for Medical Science

William J. Martone, MD
Chief
Epidemic Investigations Branch

Bryan P. Simmons, MD
Former Chief
Guidelines Activity

Other CDC Contributors

Mary Louise Atkinson, RN, MA
Assistant to the Director (retired)
Division of Tuberculosis Control
Center for Prevention Services

Kenneth J. Bart, MD
Chief
Surveillance, Investigations, and Research Branch
Division of Immunization
Center for Prevention Services

Claire V. Broome, MD
Chief
Respiratory and Special Pathogens, Epidemiology Branch
Division of Bacterial Diseases
Center for Infectious Diseases

Mitchell L. Cohen, MD
Assistant Chief
Enteric Diseases Branch
Division of Bacterial Diseases
Center for Infectious Diseases

Laurence S. Farer, MD
Director
Division of Tuberculosis Control
Center for Prevention Services

Martin S. Favero, PhD
Assistant Director for Laboratory Science
Division of Hepatitis and Viral Enteritis
Center for Infectious Diseases

Roger A. Feldman, MD
Director
Division of Bacterial Diseases
Center for Infectious Diseases

Mary E. Guinan, MD
Clinical Research Investigator
Clinical Studies Section
Operational Research Branch
Division of Venereal Diseases Control
Center for Prevention Services

Robert J. Kim-Farley, MD
Epidemic Intelligence Service Officer
Surveillance, Investigations, and Research Branch
Division of Immunization
Center for Prevention Services

Gary R. Noble, MD
Acting Director
Division of Viral Diseases
Center for Infectious Diseases

Walter A. Orenstein, MD
Chief
Surveillance and Investigations Section
Division of Immunization
Center for Prevention Services

Dixie E. Snider, Jr., MD
Chief
Research and Development Branch
Division of Tuberculosis Control
Center for Prevention Services

Frances H. Porcher, Chief
Gayle P. Lloyd, Writer-Editor
Publications and Graphics Activities
Center for Infectious Diseases

CDC GUIDELINES ON INFECTION CONTROL

The Guideline for Infection Control in Hospital Personnel is part of the *Guidelines for Prevention and Control of Nosocomial Infections.* The CDC guidelines were developed to provide a central reference for professionals involved in infection control that contains CDC recommendations and is easily accessible to the infection control personnel in hospitals. It should be emphasized that these guidelines represent the advice of CDC on questions commonly asked of the Hospital Infections Program, but are not intended to have the force of law or regulation. These guidelines can be expected to change in response to the acquisition of new knowledge.

Each guideline begins with a preamble that describes the approaches that have been used or advocated to deal with infection control issues and evaluate, where data exist, their efficacy. The preamble is followed by a group of succinct recommendations. The guidelines are assembled in a loose-leaf notebook to allow for the addition of new guidelines as they are developed and revisions as necessary.

Optimally, recommendations should be based on rigorously controlled scientific studies because recommendations of this type have the highest probability of value. There are some recommended practices that have not been adequately evaluated by controlled scientific trials, but are based on such inherent logic and broad experience that experts generally agree that they are useful. At the other extreme are recommendations that are of uncertain benefit and may be quite controversial. To address these last 2 types of practices, realizing that hospitals must make decisions in the absence of definitive data, we have sought the advice of working groups composed of non-CDC experts with broad experience in infection control. CDC has endorsed such recommendations if members of the working group have determined that the recommended practices are likely to be effective.

To assist infection control staff in critically assessing the value of these recommendations, we developed a ranking scheme that takes into account considerations of scientific validity, applicability, and practicality (Table 1). The last 2 considerations are clearly important since scientifically valid infection control practices that are applicable in one setting (e.g., debilitated patients in tertiary referral centers) might not necessarily be applicable or practical in another (e.g., acutely ill patients in community hospitals). Cost effectiveness, another important consideration, is taken into account in the ranking process when possible, although adequate data are generally lacking. We have ranked each recommendation according to the degree to which it has been substantiated by scientific data or the strength of the working group's opinion on the effectiveness and practical value of the particular practice. The rankings thus provide additional useful information for hospital officials who must decide on the recommendations (e.g., those in Category II and, especially, Category III) that best suit their hospital's needs and resources.

Finally, the adoption of these recommendations by hospitals does not guarantee that hospital personnel will adhere to them. The reduction of nosocomial infection risks depends largely on the actual performance of correct patient-care practices. Personnel may be motivated to follow those practices if they are given adequate training, followed by periodic in-service education. Continuous or periodic evaluation of patient-care practices, preferably under the supervision of the infection control staff, might assure continued performance of correct practices.

Table 1. ***RANKING SCHEME FOR RECOMMENDATIONS****

Category I. Strongly Recommended for Adoption:
Measures in Category I are strongly supported by well-designed and controlled clinical studies that show effectiveness in reducing the risk of nosocomial infections or are viewed as useful by the majority of experts in the field. Measures in this category are judged to be applicable to the majority of hospitals—regardless of size, patient population, or endemic nosocomial infection rate—and are considered practical to implement.

Category II. Moderately Recommended for Adoption:
Measures in Category II are supported by highly suggestive clinical studies or by definitive studies in institutions that might not be representative of other hospitals. Measures that have not been adequately studied, but have a strong theoretical rationale indicating that they might be very effective are included in this category. Category II measures are judged to be practical to implement. They are *not* to be considered a standard of practice for every hospital.

Category III. Weakly Recommended for Adoption:
Measures in Category III have been proposed by some investigators, authorities, or organizations, but, to date, they lack both supporting data and a strong theoretical rationale. Thus, they might be considered as important issues that require further evaluation; they might be considered by some hospitals for implementation, especially if such hospitals have specific nosocomial infection problems or sufficient resources.

***Recommendations that advise against the adoption of certain measures can be found in the guidelines. These negative recommendations are also ranked into 1 of the 3 categories depending on the strength of the scientific backing or opinions of the members of the working group. A negative recommendation in Category I means that scientific data or prevailing opinion strongly indicate that the measure not be adopted. A negative recommendation in Category III means that, given the available information, the measure under consideration should probably not be adopted; such a measure, however, requires further evaluation.**

The Guideline for Infection Control in Hospital Personnel is part of the *Guidelines for Prevention and Control of Nosocomial Infections*. The CDC guidelines were developed to provide a ready reference for professionals involved in infection surveillance, prevention, and control in hospitals and other health care settings. The recommendations in these guidelines represent the advice of CDC on questions commonly asked of the Hospital Infections Program, but are not intended to have the force of law or regulation. The guidelines can be expected to change in response to the expansion of our knowledge.

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Guideline for Infection Control in Hospital Personnel

INTRODUCTION

In the United States, about 5 million persons work in more than 7,000 hospitals. These personnel may become infected through exposure to infected patients if proper precautions are not used, or acquire infection outside the hospital. They may then transmit the infection to susceptible patients or other hospital personnel, members of their households, or other community contacts. In this guideline, we focus on diseases that are of particular concern to hospital personnel because of the possibility of transmission. In some instances we focus our discussion on transmission of infectious disease from patient-care personnel to patients. In other instances we focus on transmission of disease from patients to patient-care personnel. Recommendations for prevention and control are limited to these areas. We frequently refer to the Guideline for Isolation Precautions in Hospitals, where suggestions can be found on precautions that personnel may use when taking care of patients to prevent the spread of infection to themselves, other personnel or patients, and visitors.

Personnel who have direct contact with patients include nursing personnel, medical house staff, clinical faculty, attending physicians, paramedical staff, and nursing and medical students. Since other hospital personnel may have exposure to patients that is comparable in quality, intensity, and duration to that of patient-care personnel, hospitals may also consider them in applying these recommendations. Risk to patients from personnel with whom patients have only brief casual contact, or risk to these personnel, is generally felt to be low.

In the glossary key words or phrases used in this guideline are defined. Issues related to management of outbreaks, exposure to agents in microbiologic and biomedical laboratories, and risks from exposure to noninfectious hazards are not discussed in this guideline.

OBJECTIVES OF A PERSONNEL HEALTH SERVICE FOR INFECTION CONTROL

The infection control objectives of a personnel health service should be part of the hospital's general programs for infection control. The objectives can include 1) stressing maintenance of sound habits in personal hygiene and individual responsibility in infection control; 2) monitoring and investigating infectious diseases, potentially harmful infectious exposures, and outbreaks of infections among personnel; 3) providing care to personnel for work-related illnesses or exposures; 4) identifying infection risks related to employment and instituting appropriate preventive measures; and 5) containing costs by eliminating unnecessary procedures and by preventing infectious disease that results in absenteeism and disability. For these objectives to be met, the support of the administration, medical staff, and other hospital staff is essential.

Whether programs or services other than those for infection control are offered will depend on whether the hospital's personnel health service is devoted mainly to controlling infectious diseases or to providing a comprehensive health program for personnel.

ELEMENTS OF A PERSONNEL HEALTH SERVICE FOR INFECTION CONTROL

The organization of a health service for hospital personnel will depend on many factors, for example, the size of the institution, the number of personnel, and the services offered. These factors will determine the size, location, and staffing of the service. Regardless of how the service is provided, certain elements will assist in effectively attaining infection control goals. These elements are as follows:

1. Placement evaluations
2. Personnel health and safety education
3. Immunization programs
4. Protocols for surveillance and management of job-related illnesses and exposures to infectious diseases
5. Counseling services for personnel regarding infection risks related to employment or special conditions
6. Guidelines for work restriction because of infectious disease
7. Maintenance of health records

Placement Evaluations

When personnel are initially appointed or are reassigned to different jobs or areas, a placement evaluation can be used to ensure that persons are not placed in jobs that would pose undue risk of infection to them, other personnel, patients, or visitors. A health inventory is an important part of this evaluation. This inventory can include determining a health worker's immunization status, and obtaining a history of any conditions that may predispose the health worker to acquiring or transmitting infectious diseases, for example, a history of such childhood diseases as chickenpox and measles, history of exposure to or treatment for tuberculosis, history of hepatitis, dermatologic conditions, chronic draining infections or open wounds, and immunodeficient conditions. Physical examinations may be useful to detect conditions that may increase the likelihood of transmitting disease to patients, or unusual susceptibility to infection, and to serve as a baseline for determining whether any future problems are work-related. There are no data, however, to suggest that routine complete physical examinations are needed for infection control purposes. Neither are there data to suggest that routine laboratory testing (such as complete blood counts, serologic tests for syphilis, urinalysis, chest roentgenograms) or preemployment screening for enteric or other pathogens are cost-beneficial. The health inventory can be used to determine whether physical examinations or laboratory tests are needed. In some areas, however, local public health ordinances may still mandate that certain screening procedures be used.

It is important that initial placement evaluations be done when personnel are hired or as soon after as possible. After the placement evaluation, later appraisals may be done as needed for ongoing programs or evaluation of work-related problems.

Personnel Health and Safety Education

Personnel are more likely to comply with an infection control program if they understand its rationale. Thus, staff education should be a central focus of the infection control

program. Clearly written policies, guidelines, and procedures are needed in many instances for uniformity, efficiency, and effective coordination of activities. Since job categories vary, not all personnel need the same degree of instruction in infection control. Educational programs should be matched to the needs of each group.

Immunization Programs

Since hospital personnel are at risk of exposure to and possible transmission of vaccine-preventable diseases because of their contact with patients or material from patients with infections, maintenance of immunity is an essential part of a hospital's personnel health and infection control program. Optimal use of immunizing agents will not only safeguard the health of personnel but also protect patients from becoming infected by personnel. Following a consistent program of immunizations could eliminate the problem of susceptible personnel and avoid unnecessary work restrictions.

Immunization recommendations are made by the U.S. Public Health Service Immunization Practices Advisory Committee (ACIP) and are published periodically in the *Morbidity and Mortality Weekly Report* (MMWR). Indications for use of licensed vaccines are generally the same for hospital personnel as for the general population; however, immunity to some diseases, such as rubella, may be more important for persons who work in hospitals. Decisions about which vaccines to include in immunization programs can be made by considering 1) the risk of exposure to an agent in a given area, 2) the nature of employment, and 3) the size and kind of institution. The suggestions included in this guideline summarize ACIP recommendations as they apply to hospital personnel. The categories reflect the views of the Working Group for this guideline. The ACIP guidelines should be consulted for a detailed discussion of the rationale for active or passive immunization of hospital personnel and the general population. The ACIP guidelines can be requested from Public Inquiries, Building 1, Room B63, Centers for Disease Control, Atlanta, Georgia 30333.

• *Screening for Susceptibility to Hepatitis B or Rubella.*

The decision to screen potential vaccine recipients for susceptibility to hepatitis B virus (HBV) is an economic one, because vaccinating HBV carriers or persons already immune does not appear to present a hazard.[1,2] In the United States the prevalence of previous infection in any targeted group, the cost of screening, and the cost of immunizing personnel determine whether screening would be cost-effective.[3,4]

Routinely performing serologic tests to determine susceptibility to rubella to be sure vaccine is given only to proven susceptibles may be very expensive. The ACIP believes that rubella immunization of men and women not known to be pregnant is justifiable without serologic testing.[5]

• *Vaccine Administration*

The most efficient use of vaccines with high-risk groups is to immunize personnel before they enter high-risk situations. It is crucial that persons administering immunizing agents be well-informed about indications, storage, dosage, preparation, and contraindications for each of the vaccines, toxoids, and immune globulins they may use. Product information should be available at all times, and pertinent health history should be obtained from each health worker before an agent is given.

How immunizations are provided to personnel and who pays for vaccines are topics not addressed in this guideline.

Work Restrictions and Management of Job-related Illnesses and Exposures

Major functions of the personnel health service include arranging for prompt diagnosis and management of job-related illnesses and providing prophylaxis for certain preventable diseases to which personnel may be exposed. If susceptible personnel contract a serious infection that is potentially transmissible or are exposed to an illness that leads to a period during which infection may be spread, the hospital's responsibility to prevent the spread of infection to patients and other personnel may sometimes require that these persons be excluded from direct patient contact. For any exclusion policy to be enforceable and effective, all personnel—especially department heads, area supervisors, and head nurses—must know when an illness must be reported. Any policy for work restriction should be designed to encourage personnel to report their illnesses or exposures and not penalize them with loss of wages, benefits, or job status.

Health Counseling

Access to health counseling about illnesses they may acquire from or transmit to patients is especially important for all hospital personnel, but particularly for women of childbearing age and persons with special clinical conditions. All personnel should know about infection risks related to employment. Female personnel who may be pregnant or who might become pregnant should know about potential risks to the fetus due to work assignments and preventive measures that will reduce those risks. Among the diseases with potential for risk to a fetus if contracted by the mother are cytomegalovirus infection, hepatitis B, and rubella.

Coordinated Planning With Other Departments

For infection control objectives to be achieved, the activities of the personnel health service must be coordinated with the infection control program and with various hospital departments. This coordination will help assure adequate surveillance of infections in personnel and maintenance of effective infection control programs. During case investigations, outbreaks, and other epidemiologic studies that involve hospital personnel, coordinating activities will help to assure that investigations can be conducted efficiently and control measures implemented promptly.

Epidemiology and Control of Selected Infections Transmitted Among Hospital Personnel and Patients

Almost any transmissible infection may occur in the community at large or within the hospital and can affect both personnel and patients. However, only those infectious diseases that occur frequently in the hospital setting or are most important to personnel are discussed below. These diseases have been divided into 2 groups, according to what we know about the epidemiology and whether the primary concern is 1) preventing transmission of infection both to and from personnel and patients or 2) preventing transmission of infection primarily from infected patients to personnel. Within each section, diseases are listed alphabetically. Relevant epidemiology, microbiology, and preventive measures are reviewed for each disease. Infections that are unusual or are not major nosocomial problems in this country receive only a brief comment or none at all.

In all patient-care activities, personnel can decrease the risk of acquiring or transmitting infection by careful handwashing and by taking care of patients with potentially transmissible infections according to the CDC Guideline for Isolation Precautions in Hospitals.

ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)

Personnel have been exposed to patients with AIDS and to their clinical specimens; however, there is currently no evidence of AIDS transmission to hospital personnel or from hospital personnel to patients. The etiology of the underlying immune deficiencies of patients with AIDS is unknown. One current hypothesis is that a transmissible agent is involved. If so, the agent appears to be transmitted most commonly through intimate, direct contact with mucosal surfaces or through parenteral spread. Airborne spread and interpersonal spread through casual contact do not seem likely. These patterns resemble the distribution of disease and modes of spread of hepatitis B virus.

With our present knowledge, it appears prudent for hospital personnel to use similar precautions when taking care of patients with AIDS as those used for patients with hepatitis B virus infection[6] (see Guideline for Isolation Precautions in Hospitals). It also appears prudent for hospital personnel who have AIDS to use similar precautions as those suggested for known carriers of HBsAg to minimize their infectious risk to others (see hepatitis discussion below). Precautions have been advised for persons and specimens from persons in certain patient categories considered to be part of the AIDS spectrum. These categories include persons with the following illnesses: opportunistic infections that are not associated with underlying immunosuppressive disease or therapy; Kaposi's sarcoma (patients under 60 years of age); chronic generalized lymphadenopathy, unexplained weight loss, and/or prolonged unexplained fever in persons who belong to groups with apparently increased risk of AIDS (homosexual men, intravenous-drug abusers, Haitian immigrants, hemophiliacs).[6] However, since AIDS has been diagnosed in persons not in identified high-risk groups, personnel may also use precautions when taking care of patients whose clinical condition and epidemiologic history suggest a risk for developing AIDS. Any new information on the cause and transmission of AIDS should be considered when precautions are designed or changed.

Extraordinary care must be taken to avoid accidental wounds from sharp instruments contaminated with potentially infective material and to avoid contact of mucous membranes and open skin lesions with materials from AIDS patients. Because of the lack of pertinent information, no particular course of action can be recommended in the event of accidental percutaneous or mucosal exposure to potentially infective material from patients with AIDS. Since these patients are often in high-risk groups for hepatitis B, following the suggestions for handling exposures to blood at high risk of being positive for hepatitis B surface antigen (HBsAg) may be considered (Table 1). Currently, no information is available on the potential benefits or problems associated with administering passive or active immunizing agents or therapy in this situation.

ACUTE DIARRHEA

Various agents may cause diarrhea in patients and hospital personnel. *Salmonella, Shigella,* and *Campylobacter* species are among the common bacterial enteric pathogens. Infection with these agents may produce mild symptoms but is often accompanied by other symptoms, such as abdominal cramps, fever, or bloody diarrhea. Diarrheal illness accompanied by such symptoms suggests a bacterial cause. Rotavirus and the 27-nanometer (Norwalk and Norwalk-like) agents are among the chief causes of sporadic and epidemic viral gastroenteritis. *Giardia lamblia* and other protozoa are also frequent causes

Table 1. Summary of Postexposure Prophylaxis for Acute Percutaneous (Needle-stick) Exposures to HBV*

Status of the patient's blood the health worker was exposed to	HBsAg testing recommended	Recommended prophylaxis
HBsAg-positive		HBIG (0.06 ml/kg) immediately and 1 month after needle-stick
HBsAg status unknown Source known:		
Blood is at *High Risk* (β) of being HBsAg-positive	Yes§	IG (0.06 ml/kg) immediately and if *test positive* HBIG (0.06 ml/kg) immediately and 1 month after needle-stick or if *test negative* nothing
Blood is at *Low Risk* (¶) of being HBsAg-positive	No	Nothing or IG (0.06 ml/kg)
HBsAg status unknown Source unknown	No	Nothing or IG (0.06 ml/kg)

*Consult current ACIP recommendations for important details.

(β) *High risk that the source is HBsAG-positive*—such as patients with acute, unconfirmed viral hepatitis; patients institutionalized with Down's syndrome; patients on hemodialysis; persons of Asian origin; homosexual men; users of illicit, intravenous drugs.

§ If results can be known within 7 days after exposure. Although prophylaxis may be given up to 7 days after exposure, it is most effective when given as soon after exposure as possible, preferably within 24-48 hours. Screening of exposed personnel to determine susceptibility may also be considered, but the decision to screen should not delay the administration of globulin.

(¶)*Low risk that the source is HBsAG-positive*—such as the average hospital patient.

HBIG = Hepatitis B immune globulin
IG = Immune globulin (formerly called "immune serum globulin," ISG, or "gamma globulin")

of diarrhea. Any of these agents may be nosocomially transmitted via the hands of personnel who are infected.

If personnel contract an acute diarrheal illness accompanied by fever, cramps, or bloody stools, they are likely to be excreting potentially infective organisms in high titer in their feces. The specific cause of acute diarrhea, however, cannot be determined solely on the basis of clinical symptoms; thus, appropriate laboratory tests are important. Not allowing these persons to take care of patients pending evaluation will prevent transmission. Evaluation of personnel may usually be limited to an initial culture for bacterial pathogens and stool examination for intestinal protozoa; repeat studies may be indicated if the results of the first tests are negative and the illness persists.

Carriage of Enteric Pathogens by Personnel

Carriage of enteric pathogens may persist after resolution of the acute illness. Once the person has clinically recovered and is having formed stools, however, there should be little hazard to patients, provided normal hygienic practices are observed. Existing data suggest that appropriate antibiotic therapy may eradicate fecal excretion of *Shigella* or *Campylobacter*. If persons take antibiotics, any follow-up cultures are best taken 48 hours after the last dose. Carriage of *Salmonella*, however, calls for special concern, because carriage may be prolonged and because the clinical sequelae of acute salmonellosis are often severe in high-risk patients, such as newborns, the elderly, immunocompromised patients, and the severely ill, such as those in intensive care units. Antibiotic therapy may prolong *Salmonella* excretion or lead to emergence of resistant strains and is not generally indicated. Thus, special precautions regarding contact with high-risk patients may be needed for personnel who are convalescent carriers of *Salmonella*.

Generally, personal hygiene, particularly handwashing by personnel before and after all patient contacts, will minimize the risk of transmitting enteric pathogens to patients. Maintaining good hygiene when away from the work setting will minimize the risk of transmission to family contacts.

Food-service personnel are not discussed in this guideline. Precautions for personnel taking care of patients who have gastroenteritis are discussed in the Guideline for Isolation Precautions in Hospitals.

HEPATITIS

Viral hepatitis has long been recognized as a nosocomial hazard. The agents that most commonly cause viral hepatitis are hepatitis A virus (HAV), hepatitis B virus (HBV), and 1 or more viruses currently designated non-A, non-B (NANB).

Hepatitis A

Nosocomial hepatitis A occurs infrequently and is associated with 2 unusual circumstances: 1) the source of infection is a patient hospitalized for other reasons whose hepatitis is not apparent, and 2) the patient is fecally incontinent. These circumstances may occur in adult and pediatric patients.

Hepatitis A is transmitted primarily by the fecal-oral route. It has not been reported to occur after inadvertent needle sticks or other contact with blood. Personnel who have frequent contact with blood, such as those who work in dialysis units, do not have evidence of increased infections with HAV.[7] Hepatitis A has, however, been reported to be transmitted by blood transfusion.[8]

Fecal excretion of HAV is greatest during the incubation period of disease before the onset of jaundice. Once disease is clinically obvious, the risk of transmitting infection is decreased. However, some patients admitted to the hospital with hepatitis A may still be shedding virus[9,10] and are potentially infective. Fecal shedding of HAV can continue for up to 2 to 3 weeks after onset of dark urine; however, in most persons, viral shedding is complete about 7 days after dark urine appears.[9] Anicteric infection may also occur, especially in young children. There is no evidence supporting the existence of a chronic HAV carrier state.

Personnel can help protect themselves and others from infection with HAV by always maintaining good personal hygiene, practicing thorough handwashing at all times, and taking care of patients known to be infected with HAV according to published recommendations (see Guideline for Isolation Precautions in Hospitals). If personnel become infected with HAV, the risk of transmitting infection is very low or negligible after about 7 days after onset of jaundice. Foodborne transmission of hepatitis A is not discussed in this guideline.

Hepatitis B

Most nosocomial cases of hepatitis B unrelated to the transfusion of blood or blood products occur in hospital personnel rather than patients. Transmission occurs by parenteral or mucosal exposure to HBsAg-positive blood from persons who are carriers or have acute HBV infection. Often carriers of HBsAg and persons with acute infections are unrecognized and are therefore not known to be infective. The infectivity of blood is best correlated with the presence of hepatitis B "e" antigen (HBeAg); however, any blood that is HBsAg-positive is potentially infective. Presence of HBeAg correlates strongly with the number of infective HBV in the serum.

The principal modes of HBV transmission are given below in order of decreasing efficiency:

1. **Overt parenteral transmission.**
   Direct percutaneous inoculation by needle or instrument contaminated with serum or plasma (for example, accidental needle-sticks, transfusion of contaminated blood or blood products, and acupuncture).
2. **Inapparent parenteral transmission.**
   a. Percutaneous inoculation with infective serum or plasma without overt needle puncture (for example, contamination of fresh cutaneous scratches, abrasions, burns, or other lesions).
   b. Contamination of mucosal surfaces with infective serum or plasma (for example, mouth pipetting accidents, accidental eye splash, and other direct contact with mucous membranes of the eyes or mouth, such as hand to mouth or eye when contaminated with infective blood or serum).
   c. Transfer of infective material to skin lesions or mucous membranes via inanimate environmental surfaces (for example, surfaces of various types of hospital equipment, devices, and rubber gloves).
   d. Contamination of mucosal surfaces with infective secretions other than serum or plasma (for example, contact involving saliva or semen).

Fecal-oral transmission of HBV does not appear to occur; however, transmission among homosexual men has been described, possibly via contamination from asymp-

tomatic rectal mucosal lesions at sites of sexual contact.[11] Airborne spread of HBV by droplet nuclei does not appear to be epidemiologically important.[12,13] Transmission of HBV in dental operatories, however, by large droplets that may strike mucous membranes or contaminate environmental surfaces has not been ruled out.[13]

Within the hospital setting certain work locations and occupational categories have been identified as showing increased risk for hepatitis B infection.[7,14–20] Generally, the highest risk of HBV infection is associated with locations and occupations in which contact with blood from infected patients is frequent. The locations and occupations are as follows:*

Work locations	*Occupational categories*
Blood banks	Dentists and dental surgeons
Clinical laboratories	Dialysis technicians
Dental clinics	Laboratory technicians
Dialysis wards	Nurses
Emergency rooms	Physicians (especially surgeons and pathologists)
Hematology/oncology wards	
Operating and recovery rooms	
Pathology laboratories	

Hospital personnel who do not have physical exposure to blood are at no greater risk than the general population. Patient contact without physical exposure to blood has not been documented to be a risk factor.

To prevent transmission of hepatitis B, hospital staff must be aware of the modes of transmission and the appropriate precautions in taking care of infected patients or handling their clinical specimens (see Guideline for Isolation Precautions in Hospitals). In general, the major emphasis is on applying blood precautions, practicing proper handwashing, having minimal contact with blood or blood-contaminated excretions, and handling the blood of all patients as potentially infective material.[21]

Since droplets from the patient's mouth reach the face of the dentist during certain procedures, dentists might consider protecting their eyes, nose, and mouth from such exposure by using masks and protective eyewear. They can prevent direct contact with infective material in the mouth by routinely wearing gloves during dental procedures.

• Acute HBV Infection in Personnel and HBsAg Carriers

A carrier is defined as a person who is HBsAg-positive on at least 2 occasions at least 6 months apart. After acute infection with HBV, the likelihood of developing the carrier state lessens as the person gets older and depends on the host's immune responsiveness. Carriers and persons with acute cases have the highest concentrations of HBV in the blood and serous fluids. The risk of transmission of HBV by HBsAg-positive health professionals has been examined in recent reports.[22–28] Transmission has been documented in a few instances from oral surgeons, gynecologists performing complex pelvic surgery, and a general practitioner. HBsAg-positive personnel with exudative dermatitis on body areas that may contact patients may also pose a risk to patients.[28]

Among dental practitioners who do not routinely wear gloves, a greater risk of transmitting infection appears to be associated with highly traumatic dental work, such as tooth extractions and surgery, than with less traumatic work such as examinations and restorations. Transmission by surgeons has been related to type of surgery, in particular, major operative procedures, such as laparotomy, hysterectomy, and major repairs, during which the chance of accidental puncture wounds is presumably greater. In 1 instance, transmission by a hospital worker with a severe exudative dermatitis on both hands appeared to be related to contamination of indwelling arterial catheters.[28]

The asymptomatic carrier of HBsAg and the person with an acute case do not appear to endanger susceptible persons except through direct inoculation of his or her blood or contaminated secretions. Thus, these persons need not be restricted from patient-care responsibilities, unless there is epidemiologic evidence that the worker is transmitting infection.

Personnel who are HBsAg-positive may be able to reduce or eliminate their risk of infecting patients by wearing gloves during high-risk procedures in which their blood or body fluids may contact patients.[22,23] Double-gloving during complex surgery might also help interrupt transmission.[26] Furthermore, it is crucial to counsel known carriers of HBsAg about practicing good personal hygiene, preventing their blood and potentially infective body fluids from contacting other persons, and not donating blood.

• Hemodialysis Centers

Infection with HBV has represented a great hazard to both patients and personnel in hemodialysis centers. If adequate infection control strategies are not practiced, hepatitis B infection, once introduced, can become endemic, with patients and environmental surfaces acting as reservoirs. Isolating or segregating patients who are HBV carriers, combined with assigning seropositive personnel to take care of these patients, has greatly decreased transmission of HBV in this environment. A complete discussion of the modes of transmission and control measures for hepatitis B in dialysis centers has been published.[29]

• Pregnant Personnel

Pregnant personnel are at no greater risk of contracting hepatitis than other personnel; however, if a woman develops hepatitis B during pregnancy and is HBsAg-positive at the time of delivery, the infant is at high risk of developing neonatal hepatitis and becoming an HBsAg carrier.[30,31] Because of this risk, it is important that pregnant personnel know the dangers of working in high-risk departments and be familiar with precautions that should be used.[29] Female personnel of childbearing age may also consider immunization with hepatitis B virus vaccine (see below).

• Hepatitis B Virus (HBV) Vaccine

An inactivated vaccine of high immunogenicity and efficacy is commercially available. The application of the vaccine in acute-care hospitals will depend on the risk of HBV infection for hospital personnel and the cost of vaccine.

Present estimates of risk have been based primarily on studies of the prevalence of hepatitis serum markers in selected groups.[14–17,19,20] Incidence studies of HBV infection among hospital personnel have been few[18,32,33] and have not included all groups of hospital personnel and appropriate

*Adapted from Maynard, JE. Nosocomial viral hepatitis. Am J Med 1981; 70:440.

community controls. Thus, data that can be used to analyze the cost-effectiveness of administering vaccine to hospital personnel are not complete.

Because the risk that hospital personnel will acquire hepatitis B varies among hospitals and among different occupational groups within hospitals, each hospital should formulate its own specific immunization strategy. In developing specific immunization strategies, hospitals may use available published data[14–20,32,33] about the risk of infection. Some institutions may instead choose to serologically screen personnel in various occupational categories or work locations to determine the prevalence of seropositivity in these groups.

The decision to screen potential vaccine recipients for susceptibility to hepatitis B is an economic decision; immunizing HBV carriers and persons already immune does not appear to present a hazard.[1,2] In the United States, the prevalence of previous infection in any targeted group, the cost of screening, and the cost of immunizing personnel determine whether screening would be cost-effective.[3,4]

HBV vaccine is reported to be safe.[34–38] The Immunization Practices Advisory Committee (ACIP) has published a discussion of this vaccine and its use.[3]

Non-A, Non-B Hepatitis

The epidemiology of NANB hepatitis in the United States more closely resembles that of hepatitis B than that of hepatitis A. Important aspects of NANB infections are as follows: 1) the NANB agent(s) circulates in the blood in acute cases, 2) there appears to be a chronic blood carrier state during which blood may remain infective, and 3) transmission of NANB infection is usually associated with percutaneous needle exposure or other exposure to blood, or with inapparent parenteral transmission. Since blood containing HBsAg is not used for transfusion, most post-transfusion hepatitis in the United States is NANB. Thus, emphasis on blood precautions, as with hepatitis B, seems the most reasonable current approach to preventing transmission from patients to personnel. For personnel who contract this illness, precautions suggested for hepatitis B should be adequate to prevent transmission to patients. Techniques are not yet available to detect specific antigens and antibodies or to determine the period of infectivity after acute infection.

Needle-stick Injuries

Needle-stick injuries account for a large number of the work-related accidents reported in hospitals.[39] Most injuries happen on patient-care units when personnel are 1) disposing of used needles, 2) administering parenteral injections or infusion therapy (especially to uncooperative patients), 3) drawing blood, 4) recapping needles after use, 5) handling linens or trash containing uncapped needles, or 6) cleaning up after patient-care procedures in which needles are used. Although other infections have been reported to be transmitted by accidental needle sticks, hepatitis B and probably NANB pose the greatest risks to hospital personnel. In the absence of immunoprophylaxis, the risk of acquiring overt hepatitis B through an accidental puncture wound from a needle used on an HBsAg-positive patient is about 6%.[40]

The risk of needle-stick injuries can be reduced by discarding used needles in puncture-resistant disposal units without first recapping them or purposely bending or breaking them by hand. Risk of injury may also be reduced if personnel obtain assistance when administering injections or infusion therapy to uncooperative patients and if personnel use caution when cleaning up after procedures that include the use of needles. Additionally, the incidence of needle-stick injuries may be reduced by providing needle-disposal units throughout the hospital in locations that facilitate their immediate use, for example, in nursing stations, patient rooms, laboratories, and utility rooms.[41] When some needle-cutting devices are used, blood may spatter onto environmental surfaces. Currently, no data are available from controlled studies examining the effect, if any, of needle-cutting devices on the incidence of needle-stick injuries.

After some needle-stick injuries, immunoprophylaxis for hepatitis B or NANB may be advisable.[42] Immune globulins for protection against viral hepatitis are most effective when given soon after exposure.

HERPES SIMPLEX VIRUSES

Herpes simplex viruses (HSV) can be transmitted among personnel and patients through either primary or recurrent lesions or through secretions (such as saliva, vaginal secretions, infected amniotic fluid) that can contain the virus when no lesions are obvious. Although many sites can become infected, exposed areas of skin are most likely to be involved, particularly when minor cuts, abrasions, or other skin lesions are present. Direct contact with lesions or infected secretions is the principal mode of spread.

Transmission of HSV From Patients to Personnel

Personnel may develop an infection of the fingers (herpetic whitlow or paronychia) from exposure to contaminated oral secretions. Such exposure is a distinct hazard for nurses, anesthesiologists, dentists, respiratory care personnel, and other personnel who may have direct (usually hand) contact with either oral lesions or respiratory secretions from patients. Less frequently, personnel may develop infection of the fingers from exposure to contaminated genital secretions or lesions on skin or mucous membranes. Personnel can protect themselves from such infections by 1) avoiding direct contact with lesions, 2) wearing gloves on both hands or using "no-touch" technique for all contact with oral or vaginal secretions, and 3) thorough handwashing after patient contact (see Guideline for Isolation Precautions in Hospitals).

Transmission of HSV From Personnel to Patients

Currently, there is no evidence that personnel with genital infections pose a high risk to patients if personnel follow good patient-care practices. The risk posed by personnel with orofacial herpes to patients is unknown. Personnel with oral infections, however, can reduce the risk of infecting patients by 1) wearing an appropriate barrier—such as a mask or gauze dressing—to prevent hand contact with the lesion, 2) washing hands well before all patient care, and 3) whenever possible, not taking care of patients at high risk of severe infection such as neonates, patients with severe malnutrition, severely burned patients, and patients in immunodeficient states. The potential risk of infecting high-risk patients must be weighed against the possibility of compromising patient care by excluding personnel with orofacial herpes.

Personnel with herpetic whitlow may be more likely to transmit infection by contact. Personnel can prevent trans-

mission of HSV to patients by not working when they have active infections of the hands. Although some have suggested that personnel with herpetic whitlow may have patient contact if they wear gloves,[43,44] the adequacy of this method of preventing transmission of infection is unknown.

STAPHYLOCOCCUS AUREUS AND *STREPTOCOCCUS*, GROUP A AND GROUP B

Carriage of potential pathogens by hospital personnel has been a traditional concern of infection control practitioners. Management of personnel who are infected with *Staphylococcus aureus* or carriers of *Staphylococcus aureus* or group A or group B *Streptococcus* is discussed here. Carriage of enteric pathogens and meningococci by hospital personnel are covered elsewhere; carriage of other organisms, such as gram-negative bacteria, has rarely been implicated as a source of nosocomial infection and is not discussed.

Staphylococcus aureus *Infection and Carriage*

Staphylococcal carriage or infection occurs frequently in humans. In nosocomial transmission, there are 2 sources: a person with a lesion or an asymptomatic carrier. Persons with skin lesions due to *S. aureus* are most likely to disseminate these organisms. Direct contact is the major route of transmission. Even a single boil in an occult body site (for example, the axilla) caused by *S. aureus* may increase the likelihood of dissemination. One way to decrease the possibility of dissemination is to not allow patient-care personnel to work until skin infection caused by this organism is resolved.

The anterior nares is one of the most commonly colonized sites, but carriage of *S. aureus* may occur at other sites, such as the axilla or perineum. The epidemiology of methicillin-resistant staphylococci does not appear to be different, except that nasal carriage may be less frequent, and outbreaks tend to occur more frequently in intensive care and burn units.

Culture surveys of personnel can detect carriers of *S. aureus* but do not indicate whether carriers are likely to disseminate their organisms. Thus, such data are difficult to interpret. A more reasonable approach is to emphasize effective surveillance that permits prompt recognition of staphylococcal infections in both personnel and patients. If certain personnel are linked epidemiologically to an increased number of infections, these persons can be cultured and, if positive, removed from patient contact until carriage is eradicated. Treatment regimens, followup of implicated personnel, and management of outbreaks are not discussed in this guideline.

Group A Streptococcus *Carriage*

For nosocomial transmission, the main reservoirs for group A *Streptococcus* appear to be the pharynx, the skin, the rectum, and the female genital tract. Direct contact and large droplets are the major modes of transmitting this organism; however, airborne spread has been suggested.[45,46]

Although pharyngeal and skin infections are the most common group A streptococcal infections, outbreaks of surgical wound infections caused by this organism have been more important in the hospital. Since group A streptococcal surgical wound infections occur infrequently, the occurrence of cases should prompt a search for a carrier. If personnel are linked epidemiologically to the occurrence of disease, they should be cultured, and if positive, removed from patient contact until carriage is eradicated. Treatment regimens, followup of implicated personnel, and management of outbreaks are not discussed here.

Group B Streptococcus *Carriage*

Carriage of group B *Streptococcus* by personnel does not appear to be important in nosocomial transmission. The epidemiology of group B streptococcal infections in neonates suggests that maternal colonization with group B *Streptococcus*, followed by the infant's acquisition during passage through the birth canal, accounts for most infections that have onset soon after birth. Spread of the organism from colonized to uncolonized infants via the hands of personnel, however, may play a role in late onset neonatal infections. Careful handwashing by personnel will minimize the risk of spread from colonized to uncolonized infants.

TUBERCULOSIS

Even though the risk of nosocomial infection with *Mycobacterium tuberculosis* is low, tuberculosis (TB) continues to pose a problem for health-care personnel. In the hospital, infection is most likely to occur when a patient has unsuspected pulmonary or laryngeal TB, has bacilli-laden sputum or respiratory secretions, and is coughing or sneezing into air that remains in circulation. The best ways to protect others from a patient with TB are to maintain a high index of suspicion for TB and to institute appropriate precautions (see Guideline for Isolation Precautions in Hospitals). A complete discussion of the transmission of tuberculosis in hospitals has been published elsewhere.[47]

Screening Programs

A tuberculosis screening and prevention program for personnel is important in protecting personnel and patients.[48,49] It is important that all institutions have a screening program; however, the program should be based on local epidemiologic data, because risk of transmission varies broadly among different segments of the population and in different localities. It is important to identify hospital personnel with tuberculous infection without evidence of current (active) disease, because preventive treatment with isoniazid may be indicated.[50] Persons with tuberculous infection are those with a significant skin-test reaction, usually defined as 10 mm or more of induration to 5 Tuberculin Units (TU) of Purified Protein Derivative-Standard (PPD-S) administered via the Mantoux technique.

The tuberculin skin test is the method of choice for TB screening. The Mantoux technique (intracutaneous injection of 0.1 ml of PPD-tuberculin containing 5 TU) is preferred for screening persons for TB infection,[51] because it is the most accurate test available. A 2-step procedure[52] can be used to minimize the likelihood of misinterpreting a boosted reaction as a true conversion due to recent infection.[52,53] In the 2-step procedure, an initial tuberculin skin test (Mantoux, 5 TU PPD) is given. If this test result is 0–9 mm of induration, a second test is given at least 1 week and no more than 3 weeks after the first. The results of the second test should be used as the baseline test in determining treatment and follow-up of these personnel. A skin test result of 10 mm of induration or more is considered to be significant.

The 2-step procedure, however, may not always be necessary. Personnel in the second or third decade of life may be less likely to have had remote infection with *M. tuberculosis*. Thus, the age of personnel in an institution and the

epidemiology of nontuberculous mycobacterial infection in the geographic location may determine the frequency of the booster phenomenon.[54] Depending on these factors, the 2-step method may not detect any more reactors than a single test. A pilot study may be useful to assess the frequency of the booster phenomenon in a given hospital and, thus, the need for the 2-step test.[54]

Multipuncture skin-test methods deliver an unknown quantity of antigen and may produce both false-positive and false-negative results. When repeated tuberculin testing is required or in postexposure testing, multipuncture methods do not allow precise interpretation of test results and proper counseling.

After the initial TB screening test, policies for repeat testing can be established by considering factors that contribute to the risk that a person will acquire new infection.[49] These factors include the location and prevalence of untreated TB in the community, in the institution, and among personnel.[49] For personnel considered to be at significant risk, repeat skin tests may be necessary on a routine basis (for example, every 3–6 months or yearly). If the risk of exposure to TB is small, it is not necessary to repeat skin tests routinely.

During TB screening, it is important to obtain an initial chest roentgenogram on those persons with significant skin-test reactions, those who convert their skin tests, or those who have pulmonary symptoms that may be due to TB. There is no need to obtain routine chest films of asymptomatic, tuberculin-negative personnel.

After initial chest films of persons with significant reactions, repeated chest X-ray examinations have not been found to be of sufficient clinical value or to be cost-effective in monitoring persons for development of disease.[55] Thus, personnel known to have a significant reaction and significant reactors who have completed adequate preventive treatment do not need repeat chest films unless they have pulmonary symptoms that may be due to TB.[55,56]

Management of Personnel After Exposure

If personnel are exposed to an infective patient with TB and do not use proper precautions, it is important to skin-test these personnel 10 weeks after the exposure. Ten weeks is the upper limit of the time required for an infected person to develop hypersensitivity to tuberculin. Unless a recent skin test was given, for example, during the 3 months before the exposure, a baseline test may be needed as soon as possible after the exposure, to help in deciding whether a significant reaction at 10 weeks represents a recent conversion related to the exposure.

Because the size of the skin-test reaction can be so important, the Mantoux technique is preferred for postexposure evalutions. Those already known to have significant reactions need not be skin-tested. Those who have significant reactions upon testing need chest roentgenograms to exclude the possibility of tuberculous pulmonary disease. If chest films are normal, these persons can be advised to receive preventive treatment, unless such treatment is contraindicated. If the chest film has abnormalities compatible with pulmonary TB, these personnel need evaluation to rule out the possibility of current disease.

BCG Vaccination

Many bacille Calmette-Guérin (BCG) vaccines are available today, and they vary in immunogenicity, efficacy, and reactogenicity. Controlled trials of previous vaccines conducted before 1955 showed protection ranging from 0 to 80%; however, the efficacy of vaccines currently available in the United States has not been demonstrated directly and can only be inferred. Thus, the skin-test reaction after BCG vaccination may be quite variable, and it cannot be distinguished from that due to virulent tuberculous infection. Caution is necessary in attributing a significant skin test to prior BCG vaccination, especially if the vaccinee has recently been exposed to infective tuberculosis. A history of BCG vaccination, then, should not preclude an initial screening test, and it is important to manage a significant reaction in BCG-vaccinated persons as a possible tuberculous infection.

Skin testing after BCG vaccination or natural infection with mycobacteria may be associated with adverse reactions, including severe or prolonged ulceration at the test site. Initial use of 1 TU PPD or a partial dose of 5 TU PPD may be useful in avoiding untoward reactions in persons who might be expected to have a severe reaction, such as those with an undocumented history of a large reaction in the past. A full 5 TU dose may be used safely if the initial skin test is negative. The efficacy of this method, however, has not been examined in controlled trials.

Generally in the United States, adequate surveillance and control measures rather than BCG vaccination are all that is necessary to protect hospital personnel and patients.

Preventive Treatment and Work Restrictions

Preventive treatment of persons with significant tuberculin reactions may decrease the risk that their subclinical infections will progress to clinical disease. In determining priorities for preventive therapy the decision-maker must weigh the risk of the person's developing current tuberculosis against the risk of isoniazid toxicity, the ease of identifying and supervising those to whom preventive therapy is offered, and the likelihood of their infecting others. About 5% of persons who are recent converters will develop current disease in the first 1–2 years after infection; the risk of developing current disease gradually declines thereafter. Persons for whom preventive treatment is recommended include newly infected persons, significant reactors with abnormal chest roentgenograms and negative bacteriologic findings, persons with special clinical conditions, significant reactors less than 35 years old, even in the absence of additional risk factors, and household members of persons with newly discovered TB.[50] Contraindications to treatment include 1) previous isoniazid-associated hepatic injury or other severe adverse reactions (for example, drug fever, chills, and arthritis), and 2) acute liver disease of any etiology. Persons of age 35 years or more may need preventive treatment, if the potential exists for transmitting disease if it develops.[50] Since the risk of developing current disease is low, work restrictions may not be necessary for otherwise healthy persons who do not accept preventive therapy. However, it is essential that they be instructed to seek evaluation promptly if symptoms develop that may be caused by TB, especially if they have contact with high-risk patients.

Personnel with current pulmonary or laryngeal TB pose a risk to patients and other personnel while they are infective. Stringent requirements regarding work restrictions for hospital personnel are necessary because of this special sit-

uation. Objective measures of lack of infectivity are negative cultures and sputum smears that are free of bacilli. Criteria for removing from or returning to work should always be tailored to the individual. Multiple factors should be considered, including those that influence the expulsion of infective particles in the work air space, mainly coughing, and the characteristics of potential contacts in the work environment and possible consequences, if they become infected.[57]

VARICELLA ZOSTER

Varicella-zoster virus (VZV) is the etiologic agent of varicella (chickenpox) and zoster (shingles). Nosocomial transmission of varicella-zoster infection among personnel and patients is well recognized. Appropriate isolation of hospitalized patients with known or suspected varicella or zoster can reduce the risk of transmission to personnel (see Guideline for Isolation Precautions in Hospitals). It is advisable to allow only personnel who have had varicella or those with serologic evidence of immunity to take care of these patients.

Varicella

Varicella is transmitted primarily via airborne spread by small particle aerosols (droplet nuclei) and by large particles (droplets). The virus may also be spread by direct contact but is not likely to be spread by inanimate objects because the virus is extremely labile. The incubation period for varicella in the normal host ranges from 10 to 21 days.

Even though personnel who are susceptible to varicella may be few, it is useful to identify such persons at the time of the placement evaluation. Most persons with a clearly positive history of previous varicella are probably immune. Many with negative or unknown histories may be immune, but some may also be susceptible.[58] When available, serologic screening may be used to define susceptibility more precisely. In institutions where varicella is prevalent or where there are many high-risk patients, it may be useful to screen those personnel who have a negative or equivocal history of varicella for the presence of serum antibodies to VZV to document susceptibility or immunity. This knowledge will help in assigning personnel to areas where VZV infection is present, avoiding unnecessary work restrictions and disruption of patient service if exposure occurs, and reducing the chance of nosocomial transmission.[59] Sensitive screening techniques exist, for example, fluorescent antibody to membrane antigen (FAMA), immune adherence hemagglutination (IAH), or enzyme-linked immunosorbent assay (ELISA), but they may not be readily available. The complement fixation (CF) test is not considered to be reliable because of the false-negative results obtained by this method.

If susceptible personnel are exposed to persons with varicella, these personnel are potentially infective during the incubation period (10 to 21 days after exposure). If varicella occurs, transmission is possible until all lesions are dry and crusted.

Zoster

Zoster appears to occur as a result of activation of latent VZV. There is scant evidence to support the view that zoster can be contracted by exposure to persons with varicella or zoster. However, varicella-zoster virus can be transmitted by direct contact with a person with zoster. If susceptible personnel are exposed to zoster, varicella may occur; thus, these persons may transmit VZV during the incubation period of varicella.

Because of the possibility of transmission and development of severe illness in high-risk patients, it may be advisable to exclude personnel with zoster from taking care of high-risk patients until all lesions are crusted. Personnel with zoster may not pose a special risk to other patients if the lesions can be covered.

VIRAL RESPIRATORY INFECTIONS

Viral respiratory infections are common problems for infection control programs. The role of viruses in nosocomial infections has been recently discussed[60–62] (also, see Guideline for Prevention of Nosocomial Pneumonia). Hospital personnel, visitors, and patients are important sources of viruses.

The 3 chief mechanisms of transmission of respiratory viruses are 1) small-particle aerosols (droplet nuclei), 2) large particles (droplets), and 3) inoculation of viruses after direct contact with infective areas or materials. Different respiratory viruses may vary in the way in which they are transmitted.

Small-particle aerosols are produced by talking, sneezing, or coughing and may transmit infection over a considerable distance (more than 3 feet). Large particles (droplets) are produced by sneezing and coughing and require close person-to-person contact for transmission. Person-to-person transmission can also occur by contaminating the hands by direct contact with infective areas or materials, then transferral of infective virus to mucous membranes of a susceptible person. Self-inoculation can also occur in this way. The nose and eyes, rather than the mouth, appear to be important portals of entry.

Pediatric patients appear to be at particular risk for complications from nosocomial respiratory tract infections. Infection in the elderly, patients with chronic underlying illness, and immunocompromised patients may also be associated with significant morbidity. Thus, it may be prudent to exclude personnel with viral respiratory infections from the care of these high-risk patients. Because large numbers of personnel may have viral respiratory illnesses during the winter, it may not be possible to restrict all such personnel from taking care of patients not in high-risk groups. In all instances, careful handwashing before patient contact is essential in preventing transmission. If handwashing is done appropriately, gloves and routine use of gowns may have no additional benefit in preventing transmission to patients.[63,64] Masks might be beneficial in preventing transmission by large droplets from personnel to patients upon close contact. However, masks probably will not completely protect personnel from patients with respiratory illnesses because large particles and aerosols may still reach the eyes, and self-inoculation from contaminated hands can still occur by touching the eyes.

Influenza epidemics may require other measures. Because influenza epidemics are unpredictable, hospitals may want to determine their policy on influenza immunization each year, taking note of the recommendations from the Immunization Practices Advisory Committee (ACIP), which are revised annually. Nosocomial spread of influenza might be reduced by immunizing personnel and high-risk patients several weeks or longer before the influenza season. An antiviral drug, amantadine, may be useful to limit spread to and from patients and unimmunized personnel during an epidemic of influenza A.

CYTOMEGALOVIRUS

Personnel may be exposed to patients with cytomegalovirus (CMV) infection, but the risk of acquiring CMV infection from patients appears to be small. There are 2 principal reservoirs of CMV in the hospital: 1) infants infected with CMV and 2) immunocompromised patients, such as oncology patients and those undergoing kidney or bone marrow transplant. Available data have shown no evidence of an excess risk of transmission of CMV to personnel working in dialysis units,[65] oncology wards,[66] or pediatric areas, when compared with personnel with no patient contact.[67,68] However, evidence is accumulating to suggest sexual contact as a significant mode of transmission of CMV outside the hospital environment.[69,70] Large, well-controlled studies are needed to document the validity of these observations.

The precise mechanism of transmission is unknown; however, infection appears to be acquired only through intimate, direct contact with an excreter of CMV or contact with contaminated secretions. Virus can be shed in the urine, saliva, respiratory secretions, tears, feces, breast milk, semen, and cervical secretions.

Screening Programs for CMV Infection

Because infection with CMV during pregnancy may damage the fetus, protecting women of childbearing age from persons who are excreting the virus is of primary concern. Most infants who are infected with CMV are asymptomatic. Screening programs to detect such patients, however, are not practical, because the tests are time-consuming and costly and would entail screening all newborns. Mass screening of personnel is not likely to provide useful information because the available complement fixation (CF) tests are not reliable indicators of immunity, since these tests lack sensitivity and since the antigen most commonly used for serologic testing (the AD 169 strain) may not cross-react with all other known CMV strains. Furthermore, identifying seropositive women would not necessarily provide a group who, if they become pregnant, are at no risk of transmitting infection to the fetus, because congenital infection may result from reactivation of latent infection[71,72] and, theoretically, from exogenous reinfection. In addition, since there are no studies to indicate clearly that personnel may be protected by transfer to areas with less contact with infants and children,[67,68] identifying seronegative women in order to institute such measures may not reduce the number of primary infections.

Preventing Transmission of CMV

When hygienic precautions (appropriate handwashing, not kissing infants, etc.) are satisfactory, the risk of acquiring infection through patient contact is low.[68] Therefore, a practical approach to reducing the risk of infection with CMV is to stress careful handwashing after all patient contacts and avoiding contact with areas or materials that are potentially infective (see Guideline for Isolation Precautions in Hospitals). Patients known to be infected with CMV can be identified, and this information can be used in counseling pregnant personnel and determining their work assignments.

Personnel who contract illnesses thought to be due to CMV need not be restricted from work. They can reduce the risk of transmission to patients or other personnel by careful handwashing and exercising care to prevent their body fluids from contacting other persons.

MENINGOCOCCAL DISEASE

Nosocomial transmission of *Neisseria meningitidis* to hospital personnel taking care of patients with meningococcemia, meningococcal meningitis, or lower respiratory infections is uncommon. In rare instances transmission to personnel from patients with meningococcemia or meningococcal meningitis has occurred through intensive direct contact with the infected person and direct contact with respiratory secretions without use of proper precautions. The most likely mode of spread from a person with infections at these sites is by large droplet secretions. Risk to personnel from casual contact (for example, as usually occurs with housekeepers and with laboratory contact with clinical specimens) appears to be negligible.

Meningococcal lower respiratory infections, however, may present a greater risk of transmission than meningococcemia or meningitis alone,[73,74] especially if the patient has an active, productive cough.[73] Possible airborne transmission to other persons who did not have close contact with the infected patient has been suggested;[73] however, droplet spread could not be excluded.

When taking care of patients with suspected *N. meningitidis* infection at any site, personnel can decrease the risk of infection by using proper precautions (see Guideline for Isolation Precautions in Hospitals).

Prophylaxis After Unprotected Exposure

Antimicrobial prophylaxis can eradicate carriage of *N. meningitidis* and prevent infections in personnel who have unprotected exposure to patients with meningococcal infections. Prophylaxis is indicated for persons who have intensive direct contact with infected patients and who do not use proper precautions. Personnel who have close contact with patients who have unrecognized meningococcal lower respiratory infection and therefore do not use proper precautions might also need prophylaxis.[73] Further studies will be important to define the need for prophylaxis in this situation.

When prophylaxis is deemed necessary, it is important to begin treatment immediately. Often prophylaxis must be started before results of antimicrobial testing are available. Rifampin is now the drug of choice for prophylaxis. Because sulfonamide-resistant meningococci are prevalent, sulfonamides should be used only if the organism has been found to be sulfonamide sensitive.

Carriage of N. meningitidis *by Personnel*

Carriage of *N. meningitidis* in the nasopharynx of healthy persons has been recognized for many years, but the prevalence is quite variable. Carriage may be transient, intermittent, or chronic. Surveillance of hospital personnel to determine carriage is useful only during special epidemiologic studies. Generally, in non-outbreak situations, asymptomatic carriers among personnel need not be identified, treated, or removed from patient-care activities. Management of carriers identified during special studies is not within the scope of this guideline.

PERTUSSIS

Pertussis, caused by *Bordetella pertussis,* is highly communicable. The secondary attack rate is determined primarily by the immune status of those exposed; age may also be a factor. Unless infected persons are treated with an effective antibiotic, the period of communicability extends from the beginning of the catarrhal stage to approximately 3 weeks after onset of paroxysms.

Nosocomial transmission of pertussis has been reported infrequently. Although infection occurs less commonly in adults and may be limited to mild respiratory illness, personnel with pediatric patient contact may be involved in transmission of pertussis to patients.[75,76] However, the risk of pertussis infection and dissemination is probably not serious enough to warrant routine immunization of hospital personnel with current vaccines. Immunizing persons over age 6 is not recommended, because of the increased frequency of adverse reactions. In addition, current vaccines do not confer complete immunity, and protection against pertussis may decrease as the interval between immunization and reexposure increases. Natural immunity appears to be long-lasting, although infection in persons who reportedly had pertussis in the past has been reported.[76]

During an outbreak, removal of personnel with cough or upper respiratory tract symptoms from the care of patients may be important in preventing further spread.[75] Erythromycin prophylaxis of exposed susceptibles who are infected may abort or attenuate illness if administered in the early pre-paroxysmal cough stage of the illness. Prophylaxis for less than 14 days is frequently followed by bacteriologic relapse. Infected contacts may be identified rapidly by the fluorescent antibody (FA) technique; however, culture techniques identify infection more reliably than FA examination, because of both false-positive and false-negative results with the FA method. "Carriers" of pertussis are very unusual, because persons with positive cultures generally develop symptoms.

SCABIES

Scabies is a disease caused by infestation with the mite *Sarcoptes scabiei.* It is transmitted in hospitals primarily through intimate direct contact with an infested person, even when high levels of personal hygiene are maintained.[77–79] Transmission to personnel has occurred during activities such as sponge-bathing patients or applying body lotions. Transmission between patients may also be possible when patients are ambulatory. Transmission by casual contact, such as holding hands, has been infrequently reported.[80] Transmission via inaminate objects, such as infested bedding, clothes, or other fomites has not been implicated as a major mode of transferring mites.[77,81]

Treatment is recommended for persons with active infestation. A single, correct application[77,81] of agents used to treat scabies is curative in most cases and appears to eliminate the risk of transmission immediately after the first treatment.[77,78,81] Treatment destroys both eggs and the active forms of the mites; however, ovacidal activity has not been fully substantiated for all available agents. Repeating the treatment 7–10 days after the initial therapy will kill any newly hatched mites. Between treatments the risk of transmission is felt to be negligible.

Using appropriate precautions when taking care of infested patients will decrease the risk of transmission to personnel (see Guideline for Isolation Precautions in Hospitals). If personnel are infested with the mite, transmission can be prevented by excluding them from work until they are treated.

GLOSSARY

Exposure. An important exposure is one in which a person is subjected to an infectious agent in a way considered likely to lead to acquisition of disease. Whether an exposure to an infectious agent is important depends on various factors, including 1) the mechanism of transmission of the agent involved and the person's infective potential; for example, a non-coughing patient with pulmonary tuberculosis poses little threat; 2) the type and duration of contact; 3) host susceptibility; and 4) whether or not suggested precautions are used. The persons in each hospital who have been given the responsibility, in consultation with others who may be involved, will have to determine whether an important exposure has occurred and if some intervention after the exposure is needed.

Transmission. Microorganisms are transmitted by various routes, and the same microorganism may be transmitted by more than 1 route. For example, varicella-zoster virus can spread either by the airborne route (droplet nuclei) or by direct contact. The differences in infectivity and in the mode of transmission of the various agents form the basis for the differences in precautions that are recommended in this guideline.

There are 4 main routes of transmission—contact, vehicle, airborne, and vectorborne.

A. Contact transmission, the most important and frequent means of transmission of nosocomial infections, can be divided into 3 subgroups: direct contact, indirect contact, and droplet contact.
   1. Direct contact—This involves direct physical transfer between a susceptible host and an infected or colonized person, such as occurs between patient and hospital personnel when personnel are turning patients, giving baths, changing dressings, or performing other procedures requiring direct personal contact. Taking care of patients generally involves some direct contact. Direct contact can also occur between 2 patients, 1 serving as the source of infection and the other as a susceptible host.
   2. Indirect contact—This involves personal contact of the susceptible host with a contaminated intermediate object, usually inanimate, such as instruments, dressings, or other infective material. If proper care is not taken, personnel can contaminate objects when assembling or handling critical equipment (such as respiratory therapy equipment, pressure-monitoring devices, cardiac bypass pumps) or during other procedures that involve inanimate objects.
   3. Droplet contact—Infectious agents may come in contact with the conjunctivae, nose, or mouth of a susceptible person as a result of coughing, sneezing, or talking by an infected person. This occurrence is considered "contact" transmission rather than airborne since droplets usually travel no more than about 3 feet. "Close contact" is used to mean within 3 feet of an infected person.

B. The vehicle route applies in diseases transmitted through contaminated items, such as transmission of hepatitis non-A, non-B by contaminated blood.

C. Airborne transmission occurs by dissemination of either droplet nuclei (residue of evaporated droplets that may remain suspended in the air for long periods of time) or dust particles in the air containing the infectious agent. Organisms carried in this manner are then inhaled by or deposited on the susceptible host.

D. Vectorborne transmission is of greater concern in developing countries, for example, mosquito-transmitted malaria.

Since agent and host factors are more difficult to control, interruption of the chain of infection in the hospital is directed primarily at transmission. The precautions recommended in this guideline are based on this concept.

RECOMMENDATIONS*

1. Elements of a Personnel Health Service for Infection Control

a. Placement Evaluation
   1) A health inventory should be obtained from personnel who will have patient contact. *Category I*
   2) For infection control, complete physical and laboratory examinations should not be routinely required for all personnel but should be done when indicated; for example, the need for an examination or laboratory test may be determined from results of the health inventory. *Category I*
   3) Health assessments of personnel other than placement evaluations should be done depending only on need; for example, as required to evaluate work-related illness or exposures to infectious diseases. *Category I*
   4) Routine culturing of personnel, such as taking cultures of the nose, throat, or stool, should *not* be done as part of the placement evaluation or thereafter. *Category I* (See Guideline for Hospital Environmental Control: Microbiologic Surveillance of the Environment and of Personnel in the Hospital)

b. Personnel Health and Safety Education
   1) Initial job orientation and ongoing in-service education should include the infection control aspects of personnel health and the proper use of the personnel health service. *Category I*
   2) Specific written policies and procedures for control of infections in hospital personnel should be readily available. *Category I*

c. Job-related Illnesses and Exposures
   1) A record should be maintained on hospital personnel that includes information obtained during the placement evaluation, immunization records, results of tests obtained in any screening or con-

*The recommendations in this guideline are limited to prevention and control of infectious disease transmission among patient-care personnel and patients (see Introduction). These suggestions, however, can include other personnel. This guideline and other guidelines in the manual include all of the current recommendations of the Hospital Infections Program, CDC, on personnel health. Hospitals may choose to establish additional policies for personnel.

trol programs, and reports of work-related illnesses or exposures. *Category I*

2) A readily available mechanism should be established for personnel to obtain advice about illnesses they may acquire from or transmit to patients. *Category I*
3) Evaluation of job-related illnesses or important exposures and postexposure prophylaxis, when indicated, should be provided. *Category I*
4) Written protocols should be established for handling job-related infectious diseases or important exposures. These occurrences should be recorded in the person's record and, when applicable, the appropriate member of the infection control committee and personnel health service should be notified. *Category I*

d. Coordinated Planning and Administration
1) Each hospital should have ways to coordinate policy-making and planning among the administration, personnel health service, infection control program, and various departments. *Category I*
2) A system should be established for notifying the infection control program of 1) infections in personnel that require work restrictions or exclusion from work, 2) clearance for work after an infectious illness that required work restrictions or exclusion, 3) other work-related infections and exposures, and 4) when appropriate, results of epidemiologic investigations. *Category I*
3) A representative of the personnel health program should be on the infection control committee. *Category I*

2. Immunization of Hospital Personnel*

a. Hospitals should formulate a written comprehensive policy on immunizing hospital personnel. *Category I*
b. The following recommendations should be considered by the hospital in formulating its policies:
1) *Rubella*
a) All personnel (male or female) who are considered to be at increased risk of contact with patients with rubella or who are likely to have direct contact with pregnant patients should be immune to rubella.† *Category I*
b) Before immunizing, serologic screening for rubella need not be done unless the hospital considers it cost-effective or the potential vaccinee requests it. *Category I* (Persons can be considered susceptible unless they have laboratory evidence of immunity or documented immunization with live virus vaccine on or after their first birthday. Consideration should be given to giving rubella vaccine in combination with measles and mumps vaccines [measles-mumps-rubella (MMR) trivalent vaccine].)

2) *Hepatitis B*
a) Persons at substantial risk of HBV infection who are demonstrated or judged likely to be susceptible should be actively immunized (see text). *Category II*
b) Before immunizing, serologic screening for hepatitis B need not be done unless the hospital considers it cost-effective or the potential vaccinee requests it. *Category I*
c) Prophylaxis with an immune globulin (passive immunization) should be used when indicated, such as following needle-stick exposure to blood that is at high-risk of being HBsAg-positive. *Category I*
d) Immune globulins should not be used as a substitute for active immunization. *Category I*

3) *Measles*
All persons susceptible by history or serology who are considered to be at increased risk of contact with patients infected with measles should be protected.* *Category I* (Most persons born before 1957 have probably been infected naturally and generally need not be considered susceptible. Younger persons can be considered immune only if they have documentation of 1) physician-diagnosed measles, 2) laboratory evidence of measles immunity, or 3) adequate immunization with live measles vaccine on or after the first birthday. Consideration should be given to administering measles vaccine in combination with rubella and mumps vaccines [measles-mumps-rubella (MMR) trivalent vaccine].)

4) *Poliomyelitis*
a) Routine primary immunization for adults in the United States is not recommended. Personnel who may have direct contact with patients who may be excreting polioviruses should complete a primary series. Primary immunization with inactivated polio vaccine (IPV) instead of oral polio vaccine (OPV) is recommended for these persons whenever feasible. *Category I* (IPV is preferred because the risk of vaccine-associated paralysis following OPV is slightly higher in adults than in children and because personnel may shed virus after OPV and inadvertently expose susceptible or immunocompromised patients to live virus.)
b) In an outbreak, OPV should be provided to anyone who has not been completely immunized or whose immunization status is unknown.† *Category I*

5) *Influenza*
To avoid problems with staffing during the influenza season and to prevent spread of influenza

*Consult current ACIP recommendations for a detailed discussion of the rationale for each recommendation. See page 5 for information on obtaining the full ACIP guidelines.
†Pregnancy is a contraindication. Vaccine should not be given to pregnant women or those who may become pregnant within 3 months.

*Pregnancy is a contraindication. Vaccine should not be given to pregnant women or those who may become pregnant within 3 months.
†Exceptions to this recommendation are discussed in the current ACIP recommendations under the heading *Precautions and Contraindications: Immunodeficiency*.

from personnel to patients, efforts should be made to immunize hospital personnel against influenza in the fall of each year. *Category II*

c. Hospital personnel are not at substantially higher risk than the general adult population of acquiring diphtheria, pneumococcal disease, mumps, or tetanus. Therefore, hospital personnel should seek these immunizations from their primary care provider, according to the recommendations of ACIP. *Category I*

d. Hospitals should not assume responsibility for routine immunization of hospital personnel against pertussis, tuberculosis, cholera, meningococcal disease, plague, rabies, typhoid, typhus, or yellow fever. *Category I* (Smallpox vaccine is no longer recommended for general use.*)

3. Protection of Personnel and Other Patients from Patients with Infections

a. Patients with potentially transmissible infections should be placed on isolation precautions using recommendations in the current Guideline for Isolation Precautions in Hospitals. (This recommendation is not categorized. The working group for the Guideline for Isolation Precautions in Hospitals did not rank the isolation recommendations into categories. Although the isolation recommendations are based on well-documented modes of transmission identified in epidemiologic studies or on a reasonable theoretical rationale, there have been few studies to test the efficacy of isolation recommendations.)

4. Prevention of Needle-Stick Injuries

a. Training or instruction of personnel should include discussions of methods to prevent needle-stick injuries. *Category I*

b. Used needles should be placed in a prominently labeled, puncture-resistant container designated specifically for their disposal. *Category I*

c. Used needles should not be recapped, purposely bent, or broken by hand. *Category II*

5. Prophylaxis After Exposure

a. When prophylactic treatment with drugs, vaccines, or immune globulins is deemed necessary and is offered, personnel should be informed of alternative means of prophylaxis, the risk (if this is known) of infection if treatment is not accepted, the degree of protection provided by the therapy, and the potential side effects. *Category I*

b. Hepatitis A

1) Personnel who have had direct fecal-oral exposure to excretions from a patient found to have been incubating hepatitis A should be given immune globulin (IG) (0.02 ml/kg). *Category I*

2) Prophylaxis with immune globulin (IG) for all personnel who take care of patients with hepatitis A (other than as suggested in recommendation 5.b.1 above) should not be given. *Category I*

c. Hepatitis B

For prophylaxis against hepatitis B after percutaneous (needle-stick) or mucous membrane exposure to blood that might be infective, the recommendations in Table 1 should be followed. *Category I*

d. Hepatitis Non-A, Non-B

If needle-stick exposures occur involving patients known to have hepatitis non-A, non-B, IG (0.06 ml/kg) should be given. *Category II*

e. Meningococcal disease

Antimicrobial prophylaxis against meningococcal disease should be offered immediately to personnel who have had intensive direct contact with an infected patient without using proper precautions. If prophylaxis is deemed necessary, treatment should not await results of antimicrobial sensitivity testing. *Category I*

f. Pertussis

Antimicrobial prophylaxis against pertussis should be offered immediately to personnel who have had intensive contact with an infected patient without using proper precautions. *Category II*

g. Rabies

Hospital personnel who either have been bitten by a human with rabies or have scratches, abrasions, open wounds, or mucous membranes contaminated with saliva or other potentially infective material from a human with rabies should receive a full course of anti-rabies treatment. *Category I*

6. Personnel Restriction Because of Illnesses or Special Conditions

a. 1) Hospitals should have well-defined policies concerning contact of personnel with patients when personnel have potentially transmissible conditions. Policies should govern personnel responsibility in using the health service and reporting illness, removal of personnel from direct contact with patients, and clearance for work after an infectious disease that required work restriction. *Category I*

2) Hospitals should identify those with authority to relieve personnel of duties. *Category I*

3) Policies for exclusion from work should be designed to encourage personnel to report their illnesses or exposures and not penalize them with loss of wages, benefits, or job status. *Category I*

b. Personnel who have responsibilities for patient care and have signs and symptoms of a transmissible infectious disease should report promptly to their supervisor. *Category I*

c. Acute Diarrhea

1) Personnel with an acute diarrheal illness that is severe, is accompanied by other symptoms (such as fever, abdominal cramps, or bloody stools) or lasts longer than 24 hours should be excluded from direct patient contact pending evaluation. *Category II*

2) Whenever appropriate, specific treatment for documented infection with enteric pathogens should be made available to infected personnel. *Category I*

3) Personnel with non-typhoidal *Salmonella* enteric infections should be excluded from the direct care

*Consult current ACIP recommendations for a detailed discussion of the rationale for each recommendation. See page 5 for information on obtaining the full ACIP guidelines.

of high-risk patients until stool cultures are *Salmonella*-free on 2 consecutive specimens collected not less than 24 hours apart. *Category II*

4) a) Personnel infected by enteric pathogens other than *Salmonella* may return to work after symptoms resolve. *Category II*
   b) These persons should be individually counseled before they return to work about the importance of handwashing. *Category I*
5) Follow-up cultures or examinations of stool for pathogens other than *Salmonella* may be done to determine when the stool is free of the infecting organism. *Category III*

d. Herpes Simplex Infections
1) Personnel with primary or recurrent orofacial herpes simplex infections should not take care of high-risk patients, for example, newborns, patients with burns, or severely immunocompromised patients, until the lesions are healed. *Category II*
2) Personnel with herpes simplex infections of the fingers or hands (herpetic whitlow) should not have direct contact with patients until lesions are healed. *Category I*

e. Respiratory Infections
1) Personnel with respiratory infections should not be assigned to the direct care of high-risk patients, for example, neonates, young infants, patients with chronic obstructive lung disease, or immunocompromised patients. *Category II*
2) If an influenza epidemic is anticipated, a prevention program should be started for all patient-care personnel and high-risk patients. This program could include use of influenza vaccine and antiviral chemoprophylaxis. *Category II*

f. Streptococcal Disease
If group A streptococcal disease is suspected, appropriate cultures should be taken, and the health worker should be excluded from work until she or he has received adequate therapy for 24 hours or until streptococcal infection has been ruled out. *Category I*

g. Management of Personnel Who Are Linked to Outbreaks
Personnel who are linked epidemiologically to an increase in bacterial infections caused by a pathogen associated with a carrier state should be cultured and, if positive, excluded from patient contact until carriage is eradicated or the risk of disease transmission is eliminated. *Category I*

7. Detection and Control of Tuberculosis

a. Skin Tests
1) During the placement evaluation a tuberculin skin test should be given to all personnel, unless a previously significant reaction (10 mm or more of induration by Mantoux or vesiculation by a multiple puncture test) can be documented. The results should be used as the baseline test in determining treatment and follow-up of these personnel. *Category I*
2) The Mantoux technique using 5 TU PPD should be used. *Category II*
3) The 2-step test should be used to minimize the likelihood of interpreting a boosted reaction as a true conversion due to recent infection. *Category II* (Evaluation of the efficacy of the 2-step method in a given area may be necessary.)
4) If there is a likelihood of a severe reaction to skin testing, an initial test using a 2-step method with 1 TU PPD or a partial dose of 5 TU PPD should be considered. *Category II*
5) After the initial skin test, the need for repeat testing should be determined in each hospital by the risk of acquiring new infection; for example, personnel need not have repeat testing if the incidence of tuberculosis in the community and in personnel is very low and personnel have not been exposed to an infective case. *Category II*
6) All personnel with significant reactions should be informed about risks of developing disease, risks they may pose to their contacts, and preventive treatment (see also recommendation 7.c.). *Category I*

b. Skin Tests After BCG Vaccination
1) Persons who have had prior BCG vaccination should be skin-tested using the Mantoux method, unless a previously significant reaction can be documented. *Category I*
2) The results of skin tests in persons who have had prior BCG vaccination should be interpreted and acted on in the same manner as those in personnel who have not been vaccinated with BCG (see Preventive Treatment and Work Restrictions below). *Category I*

c. Chest Roentgenograms
1) Chest roentgenograms should be taken on those persons with significant tuberculin skin test results a) who have never been evaluated, b) who have had recent conversions, c) who have never received adequate treatment for tuberculosis, or d) who have pulmonary symptoms that may be due to tuberculosis. If the chest film suggests pulmonary TB, these persons should be evaluated to rule out the possibility of current disease. *Category I*
2) *Routine* follow-up roentgenograms should not be taken. *Category I*

d. Preventive Treatment and Work Restrictions
1) Personnel with current pulmonary or laryngeal tuberculosis whose sputum smear shows bacilli should be excluded from work until adequate treatment has begun and the sputum is free of bacilli on 3 consecutive smears obtained on separate days or until sputum cultures show no growth. *Category I*
2) Personnel who have current TB at a site other than the lung or larynx should be allowed to continue their usual activities. *Category I*
3) Personnel who discontinue medications for current pulmonary or laryngeal disease before the rec-

ommended course of therapy has been completed should not be allowed to work. *Category I*

4) a) All personnel with significant skin-test reactions who do not have current tuberculosis and who have not had previous adequate therapy should be advised to receive preventive treatment, unless such therapy is specifically contraindicated. *Category I*

b) These personnel, if otherwise healthy and receiving preventive treatment, should be allowed to continue usual activities. *Category I*

5) a) Personnel who cannot take or do not accept or complete preventive treatment should have their work situations evaluated and may require reassignment. A change in assignment should be considered, if these persons work with high-risk patients. *Category III*

b) These persons should be counseled about the risk of developing disease and risks they may pose to their contacts and should be instructed to seek evaluation of any signs or symptoms that may be due to TB. *Category I*

6) All persons with a history of TB and all personnel with significant reactions are at risk for developing current disease. These persons should be instructed to report promptly for evaluation if symptoms that may be due to TB develop. *Category I*

7) Personnel who have completed preventive treatment or adequate therapy for current disease should be exempt from further screening unless symptomatic. *Category I*

e. Postexposure Prophylaxis

1) After exposure to an infective case of tuberculosis during which proper precautions were not used, all personnel, except those already known to have significant skin-test reactions, should be skin-tested 10 weeks after the exposure. Personnel whose skin test converts should have a chest roentgenogram taken and, unless specifically contraindicated, be advised to receive preventive treatment, provided current disease has been ruled out. If the chest film suggests pulmonary TB, these persons should be evaluated to rule out current disease. *Category I*

2) Unless a skin test was given during the 3 months before exposure, a baseline skin test should be done as soon as possible after the exposure to assist in interpreting the 10-week postexposure skin test. *Category II*

3) Personnel already known to have significant reactions should not have a chest roentgenogram taken unless they have pulmonary symptoms that may be due to tuberculosis. *Category I*

8. Personnel Exposed to Varicella or Zoster

a. After exposure to varicella (chickenpox) or zoster (shingles) personnel not known to be immune to varicella (by history or serology) should be excluded from work beginning on the tenth day after exposure and remain away from work for the maximum incubation period of varicella (21 days). *Category I*

b. Personnel who have onset of varicella should be excluded from work at least until all lesions have dried and crusted. *Category I*

9. Control of Hepatitis Infections

a. Personnel who are suspected of being infected with hepatitis A virus (HAV) should not take care of patients until 7 days after the onset of jaundice. *Category III*

b. Screening for evidence of prior infection with hepatitis B virus (HBV) in personnel who work in dialysis centers or other high-risk areas should be done only when needed to institute appropriate control measures. *Category I*

c. Personnel who are known carriers of HBsAg should be counseled about precautions to minimize their risk of infecting others. *Category I*

d. 1) Personnel who have no exudative lesions on the hands and who are acutely infected with HBV, are known to be carriers of HBsAg, or have hepatitis non A/non B (NANB) should not be restricted from patient-care responsibilities, unless there is evidence of disease transmission. *Category I*

2) Personnel who have no exudative lesions on the hands and who are acutely infected with HBV, are known to be carriers of HBsAg, or have hepatitis NANB should wear gloves for procedures that involve trauma to tissues or direct contact with mucous membranes or non-intact skin. *Category II*

e. Personnel with exudative lesions on the hands who are HBsAg-positive should either wear gloves for all direct patient contact and when handling equipment that will touch mucous membranes or non-intact skin or abstain from all direct patient care. *Category I*

f. Dental personnel should consider routine use of gloves, masks, and protective eyewear when performing dental procedures. *Category III*

10. Precautions for AIDS*

a. Personnel considered to have any of the clinical features described in the AIDS spectrum should be counseled about precautions to minimize their risk of infecting others (see discussion of AIDS and HBsAg carriers in text). *Category I*

b. Personnel considered to have any of the clinical features described in the AIDS spectrum who have no exudative lesions on the hands should wear gloves for procedures that involve trauma to tissues or direct contact with mucous membranes or non-intact skin. *Category II*

c. Personnel considered to have any of the clinical features described in the AIDS spectrum and who have exudative lesions on the hands should either wear gloves for all direct patient contact and when handling equipment that will touch mucous membranes or non-intact skin or abstain from all direct patient care. *Category II*

*These suggestions are not meant to restrict hospitals from using additional precautions.

d. Dental personnel taking care of patients considered to have any of the clinical features in the AIDS spectrum should consider routine use of gloves, masks, and protective eyewear when performing dental procedures. *Category II*

11. Personnel with Other Infectious Diseases

Table 2 is a summary of the important recommendations above and work restrictions for personnel with other infectious diseases not mentioned previously.

Table 2. Summary of Important Recommendations and Work Restriction for Personnel With Other Infectious Diseases

Disease/Problem	Relieve from direct patient contact	Partial work restriction	Duration	Category
Conjunctivitis, infectious	Yes		Until discharge ceases	II
Cytomegalovirus infections	No			II
Diarrhea (see 6.c.)				
Acute stage (diarrhea with other symptoms)	Yes		Until symptoms resolve and infection with *Salmonella* is ruled out	II
Convalescent stage				
Salmonella (non-typhoidal)	No	Personnel should not take care of high-risk patients	Until stool is free of the infecting organism on 2 consecutive cultures not less than 24 hours apart	II
Other enteric pathogens	No	(See text & recommendation 6.c.)		II
Enteroviral infections	No	Personnel should not take care of infants and newborns	Until symptoms resolve	II
Group A streptococcal disease	Yes		Until 24 hours after adequate treatment is started	I
Hepatitis, viral				
Hepatitis A	Yes		Until 7 days after onset of jaundice	III
Hepatitis B				
Acute	No	Personnel should wear gloves for procedures that involve trauma to tissues or contact with mucous membranes or non-intact skin	Until antigenemia resolves	II
Chronic antigenemia	No	Same as acute illness	Until antigenemia resolves	II
Hepatitis NANB	No	Same as acute hepatitis B	Period of infectivity has not been determined	II
Herpes simplex				
Genital	No			II
Hands (herpetic whitlow)	Yes	(Note: It is not known whether gloves prevent transmission)	Until lesions heal	I
Orofacial	No	Personnel should not take care of high-risk patients	Until lesions heal	II
Measles				
Active	Yes		Until 7 days after the rash appears	I
Postexposure (Susceptible personnel)	Yes		From the 5th through the 21st day after exposure and/or 7 days after the rash appears	II

*Mumps vaccine may be offered to susceptible personnel. When given after exposure, mumps vaccine may not provide protection. However, if exposure did not result in infection, immunizing exposed personnel should protect against subsequent infection. Neither mumps immune globulin nor immune serum globulin (ISG) is of established value in postexposure prophylaxis. Transmission of mumps among personnel and patients has not been a major problem in hospitals in the United States, probably due to multiple factors, including high levels of natural and vaccine-induced immunity.

Disease/Problem	Relieve from direct patient contact	Partial work restriction	Duration	Category
Mumps				
Active	Yes		Until 9 days after onset of parotitis	I
Postexposure	Yes*		From the 12th through the 26th day after exposure or until 9 days after onset of parotitis	III
Pertussis				
Active	Yes		From the beginning of the catarrhal stage through the 3rd week after onset of paroxysms or until 7 days after start of effective therapy	I
Postexposure (asymptomatic personnel)	No			II
Postexposure (symptomatic personnel)	Yes		Same as active pertussis	I
Rubella				
Active	Yes		Until 5 days after the rash appears	I
Postexposure (susceptible personnel)	Yes		From the 7th through the 21st day after exposure and/or 5 days after rash appears	II
Scabies	Yes		Until treated	I
Staphylococcus aureus (skin lesions)	Yes		Until lesions have resolved	II
Upper respiratory infections (high-risk patients)	Yes	Personnel with upper respiratory infections should not take care of high-risk patients (See 6.e.)	Until acute symptoms resolve	II
Zoster (Shingles)				
Active	No	Appropriate barrier desirable; personnel should not take care of high-risk patients	Until lesions dry and crust	II
Postexposure (susceptible personnel)	Yes		From the 10th through the 21st day after exposure or if varicella occurs until all lesions dry and crust	I
Varicella (Chickenpox)				
Active	Yes		Until all lesions dry and crust	I
Postexposure	Yes		From the 10th through the 21st day after exposure or if varicella occurs until all lesions dry and crust	I

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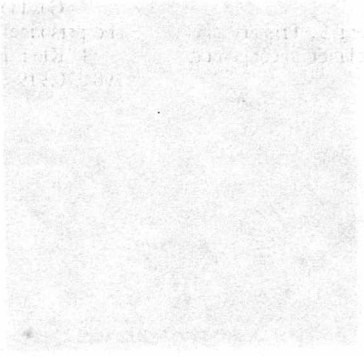

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