



Isolation Precaution Guideline Overview

Infection
Prevention &
Control

15186

Official (Rev: 1)

Affected Departments:

- All Departments

I. INTRODUCTION:

To assist hospitals in maintaining up-to-date isolation practices, the Centers for Disease Control and Prevention (CDC) and the Hospital Infection Control Practices Advisory Committee (HICPAC) have revised the "CDC Guideline for Isolation Precautions in Hospitals." HICPAC was established in 1991.

The 2007 guideline supersedes previous CDC recommendations for isolation precautions in hospitals and expands the 1996 Guideline for Isolation Precautions. The guideline recommendations are based on the latest epidemiologic information on transmission of infection in the healthcare system.

- A. The transition of healthcare delivery from primarily acute care hospitals to other healthcare settings (e.g., home care, ambulatory care, free-standing specialty care sites, long-term care) created a need for recommendations that can be applied in all healthcare settings using common principles of infection control practice, yet can be modified to reflect setting-specific needs. Accordingly, the revised guideline addresses the spectrum of healthcare delivery settings. Furthermore, the term "nosocomial infections" is replaced by "healthcare-associated infections" (HAIs) to reflect the changing patterns in healthcare delivery and difficulty in determining the geographic site of exposure to an infectious agent and/or acquisition of infection.
- B. The emergence of new pathogens (e.g., SARS-CoV associated with the severe acute respiratory syndrome [SARS], Avian influenza in humans), renewed concern for evolving known pathogens (*C. difficile*, noroviruses, community-associated MRSA [CA-MRSA]), development of new therapies (e.g., gene therapy), and increasing concern for the threat bioweapons attacks, established a need to address a broader scope of issues than in previous isolation guidelines.
- C. The successful experience with Standard Precautions, has led to a reaffirmation of this approach as the foundation for preventing transmission of infectious agents in all healthcare settings. New additions to the recommendations for Standard Precautions are Respiratory Hygiene/Cough Etiquette and safe injection practices, including the use of a mask when performing certain high-risk, prolonged procedures involving spinal canal punctures (e.g., myelography, epidural anesthesia). The recommended practices have a strong evidence base. The continued occurrence of outbreaks of hepatitis B and hepatitis C viruses in ambulatory settings indicated a need to re-iterate safe injection practice recommendations as part of Standard Precautions. The addition of a mask for certain spinal injections grew from recent evidence of an associated risk for developing meningitis caused by respiratory flora.
- D. The accumulated evidence that environmental controls decrease the risk of life-threatening fungal infections in the most severely immunocompromised patients (allogeneic hematopoietic stem-cell transplant patients) led to the update on components of the Protective Environment (PE).
- E. Evidence that organizational characteristics (e.g., nurse staffing levels and composition, establishment of a safety culture) influence healthcare personnel adherence to recommended infection control practices, and therefore are important factors in preventing transmission of infectious agents, led to a new emphasis and recommendations for administrative involvement in the development and support of infection control programs.

Abbreviations Used in the Guideline

AIIR Airborne infection isolation room

CDC	Centers for Disease Control and Prevention
CF	Cystic fibrosis
CJD	Creutzfeld-Jakob Disease
CLSI	Clinical Laboratory Standards Institute
ESBL	Extended spectrum beta-lactamases
FDA	Food and Drug Administration
HAI	Healthcare-associated infections
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HEPA	High efficiency particulate air [filtration]
HICPAC	Healthcare Infection Control Practices Advisory Committee
HIV	Human immunodeficiency virus
HCW	Healthcare worker
HSCT	Hematopoietic stem-cell transplant
CCU	Critical Care Unit
LTCF	Long-term care facility
MDRO	Multidrug-resistant organism
MDR-GNB	Multidrug-resistant gram negative bacilli
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
NCCLS	National Committee for Clinical Laboratory Stands
NICU	Neonatal intensive care unit
NIOSH	National Institute for Occupational Safety and Health, CDC
NHSN	National Healthcare Safety Network
NSSP	Nonsusceptible <i>Streptococcus pneumoniae</i>
OSHA	Occupational Safety and Health Administration
PPE	Personal protective equipment
RSV	Respiratory syncytial virus
SARS	Severe acquired respiratory syndrome
vCJD	Variant Creutzfeld-Jakob Disease
VRE	Vancomycin-resistant enterococci
WHO	World Health Organization

Rationale for Standard and Transmission-Based Precautions in Healthcare Settings

Transmission of infectious agents within a healthcare setting requires three elements: a source (or reservoir) of infectious agents, a susceptible host with a portal of entry receptive to the agent, and a mode of transmission for the agent.

Sources of Infectious agents

Infectious agents transmitted during healthcare derive primarily from human sources but inanimate environmental sources also are implicated in transmission. Human reservoirs include patients, healthcare personnel, and household members and other visitors. The endogenous flora of patients (e.g., bacteria residing in the respiratory or gastrointestinal tract) also are the source of HAIs.

Susceptible hosts

Infection is the result of a complex interrelationship between a potential host and an infectious agent. Most of the factors that influence infection and the occurrence and severity of disease are related to the host.

Modes of transmission

Several classes of pathogens can cause infection, including bacteria, viruses, fungi, parasites, and prions. The modes of transmission vary by type of organism and some infectious agents may be transmitted by more than one route.

- A. **Contact transmission**, the most important common mode of transmission, is divided into two subgroups: direct contact transmission and indirect contact transmission.
 1. Direct contact transmission occurs when microorganisms are transferred from one infected person to another person without a contaminated intermediate object or person.
 2. Indirect contact transmission involves the transfer of an infectious agent through a contaminated intermediate object or person. In the absence of a point-source outbreak, it is difficult to determine how indirect transmission occurs.
- B. **Droplet transmission** is, technically, a form of contact transmission, and some infectious agents transmitted by the droplet route also may be transmitted by the direct and indirect contact routes. Respiratory droplets are generated when an infected person coughs, sneezes, or talks or during procedures such as suctioning, endotracheal intubation, cough induction by chest physiotherapy and cardiopulmonary resuscitation.
- C. **Airborne Transmission** occurs by dissemination of either airborne droplet nuclei or small particles in the respirable size range containing infectious agents that remain infective over time and distance (e.g., spores of *Aspergillus spp.*, and *Mycobacterium tuberculosis*) small-particle residue {5 μ m or smaller in size} of evaporated droplets containing microorganisms that remain suspended in the air for long periods of time) or dust particles containing the infectious agent. Microorganisms carried in this manner can be dispersed widely by air currents and may become inhaled by a susceptible host within the same room or over a longer distance from the source patient, depending on environmental factors; therefore, special air handling and ventilation are required to prevent airborne transmission. Microorganisms transmitted by airborne transmission include *Mycobacterium tuberculosis* and the rubeola virus (measles) and varicella-zoster virus (chickenpox). In addition, published data suggest the possibility that variola virus (smallpox) may be transmitted over long distances through the air under unusual circumstances and AIIRs are recommended for this agent as well; however, droplet and contact routes are the more frequent routes of transmission for smallpox. In addition to AIIRs, respiratory protection with NIOSH certified N95 or higher level respirator is recommended for healthcare personnel entering the AIIR to prevent acquisition of airborne infectious agents such as *M. tuberculosis*.

Emerging Issues Concerning Airborne Transmission of Infectious Agents

A. Transmission from patients

The emergence of SARS in 2002, the importation of monkeypox into the United States in 2003, and the emergence of avian influenza present challenges to the assignment of isolation categories because of conflicting information and uncertainty about possible routes of transmission.

B. Common Vehicle Transmission applies to microorganisms transmitted by contaminated items such as food, water, medications, devices, and equipment.**C. Vectorborne Transmission** occurs when vectors such as mosquitoes, flies, rats, and other vermin transmit microorganisms; this route of transmission is of less significance in hospitals in the United States than in other regions of the world.

Isolation precautions are designed to prevent transmission of microorganisms by these routes in hospitals. Because agent and host factors are more difficult to control, interruption of transfer of microorganisms is directed primarily at transmission. The recommendations presented in this guideline are based on this concept.

Placing a patient on isolation precautions, however, often presents certain disadvantages to the hospital, patients, personnel, and visitors. Isolation precautions may require specialized equipment and environmental modifications that add to the cost of hospitalization. Isolation precautions may make frequent visits by nurses, physicians, and other personnel inconvenient, and they may make it more difficult for personnel to give the prompt and frequent care that sometimes is required. The use of a multi-patient room for one patient uses valuable space that otherwise might accommodate several patients. Moreover, forced solitude deprives the patient of normal social relationships and may be psychologically harmful, especially to children. These disadvantages, however, must be weighed against the hospital's mission to prevent the spread of serious and epidemiologically important microorganisms in the hospital.

Fundamentals of Isolation Precautions

A variety of infection control measures are used for decreasing the risk of transmission of microorganisms in hospitals. These measures make up the fundamentals of isolation precautions.

Hand Hygiene

Hand hygiene is the single most important practice to reduce the transmission of infectious agents in healthcare settings and is an essential element of Standard Precautions. The term "hand hygiene" includes both handwashing with either plain or antiseptic-containing soap and water and use of alcohol-based products (gels, rinses, foams) containing an emollient that do not require the use of water. In the absence of visible soiling of hands, approved alcohol-based products for hand disinfection are preferred over antimicrobial or plain soap and water because of their superior microbicidal activity, reduced drying of the skin, and convenience.

The quality of performing hand hygiene can be affected by the type and length of fingernails. Artificial fingernails and extenders are prohibited for healthcare personnel who have direct patient contact due to their association with outbreaks of gram-negative bacillus and *Candida* infections.

A. See Hand Hygiene Policy.**Personal Protective Equipment (PPE)**

PPE refers to a variety of barriers and respirators used alone or in combination to protect mucous membranes, skin, and clothing from contact with infectious agents. The selection of PPE is based on the nature of the patient interaction and/or the likely mode(s) of transmission.

Hand hygiene is performed as the first and last step of PPE utilization.

All PPE should be removed before leaving the patient's environment.

A. See Sequence for Donning/Removing PPE chart.

Gloves

Gloves are worn for three important reasons in hospitals. First, gloves are worn to provide a protective barrier and to prevent gross contamination of the hands when touching blood, body fluids, secretions, excretions, mucous membranes, and non-intact skin; the wearing of gloves in specified circumstances to reduce the risk of exposures to bloodborne pathogens is mandated by the OSHA Bloodborne Pathogens final rule. Second, gloves are worn to reduce the likelihood that microorganisms present on the hands of personnel will be transmitted to patients during invasive or other patient-care procedures that involve touching a patient's mucous membranes and non-intact skin. Third, gloves are worn to reduce the likelihood that hands of personnel contaminated with microorganisms from a patient or a fomite can transmit these microorganisms to another patient. In this situation, gloves must be changed between patient contacts and hands should be washed after gloves are removed.

Wearing gloves does not replace the need for hand hygiene, because gloves may have small, apparent defects or may be torn during use, and hands can become contaminated during removal of gloves. Failure to change gloves between patient contacts is an infection control hazard.

Gowns and Protective Apparel

Various types of gowns and protective apparel are worn to provide barrier protection and to reduce opportunities for transmission of microorganisms in hospitals. Gowns are worn to prevent contamination of clothing and to protect the skin of personnel from blood and body fluid exposures. Gowns especially treated to make them impermeable to liquids, leg coverings, boots, or shoe covers provide greater protection to the skin when splashes or large quantities of infective material are present or anticipated. The wearing of gowns and protective apparel under specified circumstances to reduce the risk of exposures to bloodborne pathogens is mandated by the OSHA Bloodborne Pathogens final rule.

Gowns also are worn by personnel during the care of patients infected with epidemiologically important microorganisms to reduce the opportunity for transmission of pathogens from patients or items in their environment to other patients or environments; when gowns are worn for this purpose, they are removed before leaving the patient's environment.

Masks, Respiratory Protection, Eye Protection, Face Shields

Various types of masks, goggles, and face shields are worn alone or in combination to provide barrier protection. A mask that covers both the nose and the mouth, and goggles or a face shield are worn by hospital personnel during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions to provide protection of the mucous membranes of the eyes, nose, and mouth from contact transmission of pathogens. The wearing of masks, eye protection, and face shields in specified circumstances to reduce the risk of exposures to bloodborne pathogens is mandated by the OSHA bloodborne pathogens final rule. A surgical mask generally is worn by hospital personnel to provide protection against spread of infectious large-particle droplets that are transmitted by close contact and generally travel only short distances (up to 3 ft) from infected patients who are coughing or sneezing.

NIOSH has indicated that the N95 (N category at 95% efficiency) meets the CDC performance criteria for a tuberculosis respirator. *See Airborne Isolation Policy.*

Masks, Respiratory protection, Eye protection, Face shields are removed before leaving the patient's environment.

Patient Placement

Appropriate patient placement is a significant component of isolation precautions. A private room is important to prevent direct- or indirect-contact transmission when the source patient has poor hygienic habits, contaminates the environment, or cannot be expected to assist in maintaining infection control

precautions to limit transmission of microorganisms (i.e., infants, children, and patients with altered mental status). When possible, a patient with highly transmissible or epidemiologically important microorganisms is placed in a private room with hand hygiene and toilet facilities, to reduce opportunities for transmission of microorganisms.

When a private room is not available, an infected patient is placed with an appropriate roommate. Patients infected by the same microorganism usually can share a room, provided they are not infected with other potentially transmissible microorganisms and the likelihood of re-infection with the same organism is minimal. Such sharing of rooms, also referred to as cohorting patients, is useful especially during outbreaks or when there is a shortage of private rooms. When a private room is not available and cohorting is not achievable or recommended, it is very important to consider the epidemiology and mode of transmission of the infecting pathogen and the patient population being served in determining patient placement. Under these circumstances, consultation with infection prevention and control professionals is advised before patient placement. Moreover, when an infected patient shares a room with a non-infected patient, it also is important that patients, personnel, and visitors take precautions to prevent the spread of infection and those roommates are selected carefully.

Nursing will identify isolation patient's room by using appropriate signs and red tape to be placed on floor at doorway of room. White tape to be used when patient is known to have *C. diff*. Tape will identify type of cleaning for Environmental Services. The Infection Prevention and Control Manager or Coordinator at Ext 3614 prior to initiation must specifically approve all cohorting. After hours pager (714) 570-7911.

Ambulatory settings

Patient's actively infected with or incubating transmissible infectious diseases are seen frequently in ambulatory settings (e.g., outpatient clinics, physicians' offices, emergency departments) and potentially expose healthcare personnel and other patients, family members and visitors. In response to the global SARS outbreak of 2003 and in preparation for pandemic influenza, outpatient settings are being urged to implement source containment measures to prevent transmission of agents causing respiratory infections, beginning at the point of initial patient encounter. Signs posted at the entrance to facilities or at the reception or registration desk may request that the receptionist promptly be informed if the patient or individuals accompanying the patient has symptoms of a respiratory infection, e.g., cough, flu-like illness, increased production of respiratory secretions. The presence of diarrhea, skin rash, or known exposure to a transmissible disease (e.g., measles, pertussis, chickenpox, tuberculosis, SARS) also could be added. Whenever possible, placement without delay in an examination room limits the number of exposed individuals in the common waiting area.

In waiting areas, maintaining a distance between symptomatic and non-symptomatic patients (e.g. >3 feet), in addition to source control measures, should limit most exposures. However, infections transmitted via the airborne route (e.g., tuberculosis, measles, chickenpox) will require additional precautions. Patients suspected of having an airborne infection may be asked to wear a surgical mask, if tolerated, for source containment and placed in an isolation room as soon as possible. If this is not possible, having the patient wear a mask and segregate him/herself from other patients in the waiting area will reduce opportunities to expose others. HCW's should wear NIOSH-approved respirators (N95 or higher) when entering the isolation room. The person accompanying the patient also should be considered potentially infectious and instructed to follow the same infection control instructions given to the patient. Patients with underlying conditions (e.g., those who are immunocompromised or have cystic fibrosis), require special efforts to protect them from exposures to infected patients in common waiting areas. These patients should inform the receptionist of their risk for infection upon arrival so that appropriate steps may be taken to further protect them from infection.

A. See Respiratory Hygiene Policy.

Transport of Infected Patients

Limiting the movement and transport of patients infected with virulent or epidemiologically important microorganisms and ensuring that such patients leave their rooms only for essential purposes reduces

opportunities for transmission of microorganisms in hospitals. When patient transport is necessary, it is important that:

- A. Appropriate barriers (e.g., masks, impervious dressings) are worn or used by the patient to reduce the opportunity for transmission of pertinent microorganisms to other patients, personnel, and visitors and to reduce contamination of the environment;
- B. Personnel in the area to which the patient is to be taken are notified of the impending arrival of the patient and of the precautions to be used to reduce the risk of transmission of infectious microorganisms.

See "Unit-Unit Notification of Isolation Patients" attachment

Patient-Care Equipment and Articles

Non-critical equipment (i.e., equipment that touches intact skin) contaminated with blood, body fluids, secretions, or excretions is cleaned and disinfected after use, according to hospital policy. Contaminated disposable (single-use) patient-care equipment is handled and transported in a manner that reduces the risk of transmission of microorganisms and decreases environmental contamination in the hospital; the equipment is disposed of according to hospital policy and applicable regulations.

Medical equipment must be cleaned and maintained according to the manufacturers' instructions. Non-critical items, such as commodes, intravenous pumps, and ventilators, must be thoroughly cleaned and disinfected prior to use on another patient. All such equipment and devices should be handled in a manner that will prevent Health Care Worker (HCW) and environmental contact with potentially infectious material.

In all healthcare settings, patients known or suspected to be colonized or infected with multidrug-resistant or epidemiologically important organisms requiring Isolation Precautions should be provided with dedicated non-critical medical equipment (e.g., stethoscope, blood pressure cuff, electronic thermometer). When this is not possible, cleaning with a low-level disinfectant after use is recommended.

Linen and Laundry

Soiled textiles, including bedding, towels, and patient or resident clothing may be contaminated with pathogenic microorganisms. However, the risk of disease transmission is negligible if it is handled, transported, and laundered in a safe manner.

Key principles for handling soiled laundry are:

- A. do not shake the items or handle in any way that may aerosolize infectious agents;
- B. avoid contact of the body and personal clothing with the laundry; and
- C. contain it in a laundry bag or designated bin. When laundry chutes are used, they must be maintained to minimize dispersion of aerosols from contaminated items.

Dishes, Glasses, Cups, and Eating Utensils

No special precautions are needed for dishware (e.g., dishes, glasses, cups) or eating utensils; reusable dishware and utensils may be used for patients requiring Isolation Precautions. The combination of hot water and detergents used in dishwashers is sufficient to decontaminate dishware and eating utensils. In the home and other communal settings, all individuals should be taught and encouraged not to share eating utensils and drinking vessels as part of good personal hygiene and for the purpose of preventing transmission.

If hot water or adequate conditions for cleaning utensils and dishes are not available, disposable products should be used.

Routine and Terminal Cleaning

The room, or cubicle, and bedside equipment of patients on Transmission-Based Precautions are cleaned using the same procedures used for patients on Standard Precautions, unless the infecting microorganism (s) and the amount of environmental contamination indicate special cleaning. In addition to thorough cleaning, adequate disinfection of bedside equipment and environmental surfaces (e.g., bed rails, bedside tables, carts, commodes, doorknobs, faucet handles) is indicated for certain pathogens, especially enterococci, which can survive in the inanimate environment for prolonged periods of time.

A. See Transmission based Isolation Policies: Patient-Care Equipment

TABLE 1. HISTORY OF GUIDELINES FOR ISOLATION PRECAUTIONS IN HOSPITALS*

YEAR (Ref)	DOCUMENT ISSUED	COMMENT
1970 (639)	Isolation Techniques for Use in Hospitals, 1st ed.	<ul style="list-style-type: none"> • Introduced seven isolation precaution categories with color-coded cards: Strict, Respiratory, Protective, Enteric, Wound and Skin, Discharge, and Blood • No user decision-making required • Simplicity a strength; over isolation prescribed for some infections
1975 (640)	Isolation Techniques for Use in Hospitals, 2nd ed.	<ul style="list-style-type: none"> • Same conceptual framework as 1st edition
1983 (641)	CDC Guideline for Isolation Precautions in Hospitals	<ul style="list-style-type: none"> • Provided two systems for isolation: category-specific and disease-specific - Protective Isolation eliminated; Blood Precautions expanded to include Body Fluids - Categories included Strict, Contact, Respiratory, AFB, Enteric, Drainage/Secretion, Blood and Body Fluids - Emphasized decision-making by users
1985-88 (427, 428)	Universal Precautions	<ul style="list-style-type: none"> • Developed in response to HIV/AIDS epidemic - Dictated application of Blood and Body Fluid precautions to all patients, regardless of infection status - Did not apply to feces, nasal secretions, sputum, sweat, tears, urine, or vomitus unless contaminated by visible blood - Added personal protective equipment to protect HCW's from mucous membrane exposures - Hand hygiene recommended immediately after glove removal - Added specific recommendations for handling needles and other sharp devices; concept became integral to She's 1991 rule on occupational exposure to blood-borne pathogens in healthcare settings
1987 (642)	Body Substance Isolation	<ul style="list-style-type: none"> • Emphasized avoiding contact with all moist and potentially infectious body substances except sweat even if blood not present • Shared some features with Universal Precautions • Weak on infections transmitted by large droplets or by contact with dry surfaces • Did not emphasize need for special ventilation

		to contain airborne infections
1996 (1)	Guideline for Isolation Precautions in Hospitals	<ul style="list-style-type: none"> • Hand hygiene after glove removal not specified in the absence of visible soiling • Prepared by the Healthcare Infection Control Practices Advisory Committee (HICPAC) • Melded major features of Universal Precautions and Body Substance Isolation into Standard Precautions to be used with all patients at all times • Included three transmission-based precaution categories: airborne, droplet, and contact • Listed clinical syndromes that should dictate use of empiric isolation until an etiological diagnosis is established

- Derived from Garner ICHE 1996

II. REFERENCES:

- A. Siegel, J, Rhinehart, E., Jackson, M., Chiarello, L., the Healthcare Infection Control Practices Advisory Committee, 2007 guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007, June 2007
- B. CDC. Guideline for Hand Hygiene in Health-Care Settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. MMWR 2002;51(No. RR-16):1-44.

III. ATTACHMENTS:

- A. Table 1. Infection Control Isolation Precaution Guideline Application of Standard Precautions for the Care of all Patients in All Healthcare Settings
- B. Table 2. Clinical Syndromes or Conditions Warranting Empiric Transmission-Based Precautions Pending Confirmation of Diagnosis

Referenced Documents

Reference Type	Title	Notes
Signed by (01/20/2012) Teresa Frey, Clinical Excellence (03/16/2012) Suzanne Smith, Medical Staff Committee Proxy (03/21/2012) Lucinda L Radcliffe, Director, Medical Staff & MEC Proxy (03/28/2012) Tes Pane, Director, Board Liaison & Board Proxy (02/16/2012) David Petreccia, Infection Prevention & Control (02/22/2012) Michael Marino, Chief Medical Officer		
Effective 10/01/2008		Document Owner Skinner, Claudia

Paper copies of this document may not be current and should not be relied on for official purposes. The current version is in Lucidoc at

<https://www.lucidoc.com/cgi/doc-gw.pl?ref=sjmc:15186>.