

The Joint Commission: Isolation Precautions

Isolation Precautions

Lesson Information

Purpose

To provide healthcare workers with information to increase their knowledge and to help them meet the requirements of The Joint Commission, Occupational Safety & Health Administration, and other regulatory bodies, with the goal of providing safe, competent, and quality patient care.

Abstract

Preventing the spread of communicable diseases in healthcare organizations is a major concern. To prevent the development of healthcare-associated infections, the Centers for Disease Control and Prevention (CDC) developed isolation precaution guidelines for infection control practices.

On average, each day, about 1 in 25 hospitalized patients have at least one healthcare-associated infection. In 2011, an estimated 722,000 healthcare-associated infections occurred, resulting in about 75,000 deaths.

This lesson covers the CDC's isolation precaution guidelines. The lesson also explains how infections spread and the precautions healthcare workers should use to decrease the risk of spreading infections.

Objectives

Upon completion of this lesson, you will be able to:

1. Describe differences between the previous infection prevention recommendations and current guidelines.
2. Recognize the isolation categories required by the current guidelines.
3. Identify the personal protective equipment (PPE) required by the current guidelines.
4. Identify the components of Standard Precautions.

Introduction

Preventing the spread of communicable diseases in healthcare organizations is a major concern. To prevent the development of healthcare-associated infections, the Centers for Disease Control and Prevention (CDC) developed isolation precaution guidelines for infection control practices.

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The Centers for Medicare & Medicaid Services (CMS) does not make payments for the treatment of certain healthcare-associated infections if they are acquired in the acute care setting. Healthcare-associated infections cost the United States at least \$9.8 billion a year.

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Focus of the Guidelines: The Role of the Environment

The current version of the Centers for Disease Control and Prevention's guidelines for isolation precautions focuses on the role of the environment in the transmission of infection. The guidelines apply to all facilities that administer healthcare services, including:

- Hospitals
- Long-term care facilities
- Ambulatory care settings
- Home care settings

The most current version of the isolation precautions document was published in 2007. Implementation of the 2007 **Guidelines for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings** is mirrored in The Joint Commission Infection Prevention and Control Standards.

Changes to the Guidelines

Although most of the current isolation guidelines are the same as in previous versions, some changes may affect your practice. These changes should be included in your healthcare organization's infection control policies and procedures.

Term	Definition of Term/Reason for Change
Airborne infection isolation room	Old terminology indicated that patients in airborne isolation needed to be housed in negative-pressure rooms. New updates to criteria for airborne infection isolation rooms go beyond negative pressure and may include the use of respirators.
Healthcare-associated	Term reflects a new focus on all healthcare settings, not just hospitals.
Hand hygiene	A broad term referring to the process of removing bacteria and dirt from the hands. Hand hygiene applies to handwashing and the use of an alcohol-based hand rub product.
Respiratory hygiene	This new addition to Standard Precautions is a set of practices designed to decrease the risk of spreading an infection via respiratory droplets.

The Joint Commission Standards

According to The Joint Commission, healthcare organizations must implement infection prevention and control plans by:

- Following evidence-based guidelines or best practices to reduce or prevent HAIs
- Using Standard Precautions and Transmission-Based Precautions
- Investigating all outbreaks of infectious diseases
- Minimizing the risk of infection when storing and disposing of infectious waste
- Developing methods to communicate information about infection prevention and control to all healthcare workers, patients, visitors, and families
- Reporting all infection surveillance, prevention, and control information to staff and to local, state, and public authorities
- Informing organizations about infections that require monitoring, treatment, or isolation when transferring an infected patient to another facility
- Demonstrating an emergency preparedness plan to safely and competently manage patients with confirmed or suspected Ebola while reducing the risk of transmission to others.

National Patient Safety Goal 7, "Prevent infection," contains standards which require hospitals follow evidence-based guidelines and best practices to reduce or prevent HAIs and improve hand hygiene

Risk Factors for Healthcare-Associated Infections

Many factors place a patient at risk for a healthcare-associated infection. The Joint Commission requires organizations to complete an infection risk assessment and an assessment of infection rates based on goals set by the organization. These risk factors relate to the patient's underlying condition, environment, and treatments, including:

- Exposure to a healthcare worker's contaminated hands
- Prolonged hospitalization or an intensive care unit stay
- Surgery (risk for wound infection)
- Underlying diseases, such as cystic fibrosis, diabetes mellitus, heart disease, or cancer
- More severe illness
- Advanced age or very young age, such as:
 - Infant prematurity—children in neonatal intensive care and pediatric intensive care units
 - Older age
- Immunosuppression
- Decreased sensorium

- Use of invasive device and length of use, including:
 - Urinary catheters may cause a urinary tract infection
 - Ventilators may cause pneumonia
 - Intravenous lines, central venous catheters, arterial lines, and pulmonary artery catheters may cause a bloodstream infection
 - Intra-aortic balloon pumps may cause a bloodstream infection
 - Newly implanted ventricular assist devices may cause a bloodstream infection

Infection Transmission

Transmission of infectious agents within a healthcare setting requires three elements: a source or reservoir for infectious agents, a susceptible host with a portal of entry, and a mode of transmission for the agent. When all three of these elements are present, an infection is likely to occur.

Source or Reservoir for Infectious Agents

Reservoirs for infection in healthcare facilities can include:

- Human sources, such as patients, visitors, or healthcare workers
- Inanimate environmental sources, such as patient care equipment
- The patient's own **endogenous flora**, or bacteria residing in the patient, usually on the skin or in the respiratory or gastrointestinal tract. An example is *Staphylococcus aureus* on the skin.

Susceptible Host with a Portal of Entry

Infectious agents must have a portal of entry or a way into the body, and patients must be susceptible to the infectious agent for infection to occur, such as in an immunosuppressed patient.

Mode of Transmission for the Agent

How the infectious agent is transmitted from person to person or from the environment to a person, such as through contaminated hands or medical equipment.

Modes of Infection Transmission

There are three routes of infection transmission within healthcare settings: airborne, contact, and droplet. Most diseases can only be spread via one route, but some diseases, such as chickenpox (varicella), can be spread by multiple routes.

The Ebola virus is spread through direct contact through the mucous membranes such as the eyes, nose or mouth, or broken skin, with bodily fluids such as blood, vomit, feces, urine, semen, sweat, saliva, or breast milk, or contaminated surfaces or objects such as needles and syringes.

Airborne Transmission

Airborne transmission of an infection occurs by dissemination of airborne droplet nuclei. Because of their small size, these particles can attach themselves to dust particles and be carried by air currents to far distances.

When you inhale droplet nuclei, the respiratory tract—the mucous membranes of the nose, mouth, or pharynx—becomes the portal of entry into the body. Once the agent enters your body, it can replicate and cause an infection if the immune system is unable to control and eliminate the agent.

In addition to being a risk to susceptible people in the immediate area, airborne droplet nuclei can pose a risk to people farther from the infected person. Airborne droplet nuclei can cross barriers such as doors and cracked or improperly sealed windows. This ability allows the droplet nuclei to move into other air spaces where they can then be inhaled by individuals outside the immediate vicinity of the source.

Contact Transmission

Contact transmission is divided into two subcategories: direct and indirect contact. The primary difference between the two subcategories is whether an environmental source is involved.

- **Direct contact** occurs when microorganisms are transmitted from one infected person to another person without involvement of an environmental source. For example, a susceptible person comes into direct contact with an infected person's contaminated bodily fluids or stool.
- **Indirect contact** occurs when microorganisms are transmitted from one infected person to another through a contaminated environmental source. Fomites are contaminated objects that can transmit germs to a person. For example, a microorganism can be transmitted through shared toys in pediatric areas.

Contact is the most common method of infection transmission in healthcare settings. One of the most important contributors to indirect contact spread in healthcare settings is contaminated hands of healthcare workers.

Droplet Transmission

Droplet transmission occurs when a susceptible person inhales the respiratory droplets of an infected person, or when the respiratory droplets are transmitted by direct and indirect contact. Respiratory droplets are large, heavy drops that are released from the respiratory tract via the nose or mouth when infected people sneeze, cough, talk, or breathe. If someone is close to the patient when these droplets are released, he or she can inhale them. The respiratory tract—the mucous membranes of the nose, mouth, or pharynx—then becomes the portal of entry into the body. Once the agent enters the body, it can replicate and cause an infection. For example, the influenza virus can be transmitted through droplets created when an infected individual coughs without covering his or her mouth.

Isolation Precautions

Isolation precautions are four categories of infection prevention strategies used to decrease the spread of communicable diseases in healthcare settings.

The four categories of isolation precautions are listed in the table. These categories are based on the routes of infection transmission within healthcare settings.

Categories of Isolation Precautions	
Standard	Standard Precautions are used for all patients, regardless of their diagnosis or whether they have a communicable disease.
Airborne	These three categories are used when additional measures are needed because Standard Precautions will not completely block the route of transmission. Collectively, these three categories are referred to as Transmission -Based Precautions, meaning that extra precautions are chosen based on the known transmission route of the infectious agent.
Contact	
Droplet	

Standard Precautions

Standard Precautions should be used for all patients every time there is an interaction between the healthcare provider and the patient. Standard Precautions encompass use of the following:

- Proper hand hygiene
- Personal protective equipment that is specific to the job being performed
- Respiratory cough etiquette

Standard Precautions also include the recommendation to never have unprotected contact with any lesion, non-intact skin, or body fluid. Whenever you encounter a wet surface, assume it is covered in infectious particles. Even if the wetness is not a body fluid, wet areas are usually breeding grounds for bacteria, so microorganisms are likely to be living there.

Hand Hygiene

Hand hygiene is a critical component of isolation precautions. It is the single most important intervention to decrease the risk of spreading communicable diseases in healthcare facilities. Hand hygiene consists of hand-washing, or the use of an alcohol-based hand rub product.

Methods Used to Perform Hand Hygiene

If your hands are visibly dirty, use soap and water rather than an alcohol-based hand rub because the mechanical action of washing your hands removes the debris.

- Wash your hands for at least 15 seconds.
- Use lukewarm water for hand-washing because very hot or cold water increases skin irritation and dryness. Irritation or dryness can cause small tears and cuts in the skin, which provide a portal of entry for germs.
- Do not touch the faucet handles after hand-washing. Faucets are covered with microorganisms, and could contaminate your hands. Instead, turn off the faucet using a paper towel or the back of the wrist. Use a paper towel to open the bathroom door when you exit.

If hands are not visibly soiled, use a waterless product such as an alcohol-based hand rub. Alcohol-based hand rubs are more effective in decreasing the number of bacteria on hands than soap and water. Alcohol-based hand rubs are also useful when water is not available.

In some studies, up to 4.6 million bacteria have been found on healthcare workers' hands.

When to Perform Hand Hygiene

In general, perform hand hygiene under these conditions:

Before	After	Before and After
<ul style="list-style-type: none"> • Eating • Touching your face • Entering a patient's room • Putting on gloves 	<ul style="list-style-type: none"> • Contact with a patient's skin, even if the skin was intact • Contact with body fluids • Contact with medical equipment 	<ul style="list-style-type: none"> • Having direct contact with patients • Performing sterile procedures
	<ul style="list-style-type: none"> • Removing gloves • Using the Restroom • Leaving a patient's room 	

Personal Protective Equipment

Personal protective equipment refers to the equipment used to protect workers from exposure to harmful substances, including infectious particles. Choose personal protective equipment based on the task you are performing. Four types of personal protective equipment are used to prevent the spread of infectious diseases in healthcare settings:

- Gloves
- Gowns
- Eye protection, such as goggles or face shields
- Respiratory protection, such as masks and respirators

Use the least amount of personal protective equipment that is necessary. The order of putting on—or donning—and removing personal protective equipment is important when more than one piece is used. Improper application or removal of personal protective equipment can contribute to the spread of diseases and raise your risk for acquiring an infection.

When caring for a patient with confirmed or suspected Ebola, there are stricter guidelines for the use of PPE. Please use the Mosby Skills checklist in the Resources section for donning and doffing PPE that is recommended specifically for Ebola patients.

Gloves

Use gloves when you anticipate:

- Hand contact with blood or body fluids, mucous membranes, non-intact skin, or potentially infectious material
- Direct contact with a patient who has a disease that is spread via the contact route
- Handling or touching visibly or potentially contaminated patient care equipment

Gloves are used to protect hands from gross contamination. They are not completely effective at preventing microorganisms from getting on hands, so always perform hand hygiene after removing gloves. Gloves are disposable and should never be washed and reused between patients. If wearing a gown, place the gloves over the cuff of the gown.

If you are caring for a patient with confirmed or suspected Ebola, two pairs of nitrile gloves are worn – an inner pair and an outer pair. To disinfect contaminated gloves during care, use an alcohol-based hand rub.

Contact Precautions

Contact precautions, or contact isolation are used for patients who have a disease that is spread by the direct and indirect contact route, and with those who have a draining wound or are incontinent of stool. This includes those infected with multidrug-resistant organisms, such as methicillin-resistant *Staphylococcus aureus* (MRSA).

Contact isolation consists of the following:

- Place the patient in a private room when available.
 - Place patients with the same pathogen together, if private rooms are not available.
 - Maintain at least 3 feet between beds in multi-patient rooms.
 - Wear a gown and gloves for each patient encounter.
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- Cover draining wounds or lesions when possible.
 - Limit patient transport outside of the room.
 - Use dedicated patient care equipment whenever possible, or disinfect equipment between patients.

Special contact precautions are implemented when the patient has a disease associated with spore-forming organisms such as *C. difficile* or Norwalk virus. Special contact precautions require the use of soap and water for hand washing. Alcohol-based hand rubs do not kill the spores.

Special precautions for the care and management of patients with confirmed or suspected Ebola are necessary. This includes specific steps for putting on and taking off PPE (special training required), limiting the number of staff who are permitted to enter the patient's room, using single-patient use or dedicated medical equipment, and special handling of contaminated waste.

Isolation Gowns

Wear an isolation gown every time you enter a patient room.

Gowns should cover clothes and tie in the back. Be sure to tie the gown to prevent it from falling off during patient care, which leads to cross-contamination when you pull it back up. Put on gloves after the gown, and make sure the gloves cover the cuffs so that no skin is exposed.

Never wear the same gown between rooms, even if the patients are in the same type of isolation or have the same disease.

Remove the gown in a way that reduces the likelihood of contaminating your hands and skin. Keep in mind that the inside of the gown is considered clean, while the outside of the gown is contaminated.

If you are caring for a patient with confirmed or suspected Ebola, the CDC recommends you wear a fluid-resistant or impermeable gown with a mid-calf length or a coverall without an attached hood. The process for putting on and taking off PPE is performed using specific steps recommended by the CDC. Staff are specially trained for the process, and a trained observer assists during the steps to put on and take off PPE.

Eye Protection

Eye protection consists of goggles or face shields. Wear eye protection any time you anticipate a splash or spray to the eyes. Eyeglasses and contact lenses are not considered adequate eye protection in the healthcare setting.

The front of goggles or a face shield is considered contaminated. Therefore, use the arm, earpieces, or ties of the goggles or face shield to remove the eye protection from your face. Take off eye protection after gloves are removed and perform hand hygiene.

When caring for a patient with confirmed or suspected Ebola, the CDC recommends using eye protection based on the type of respirator used. If using the N95 respirator, a full face shield is recommended. If using a powered air-purifying respirator (PAPR), this comes with a full shield, helmet, or headpiece.

Single-use disposable boot covers are required when caring for a patient with confirmed or suspected Ebola. Boot or shoe covers should allow for ease of movement and must not present a slip hazard to the wearer. To remove, sit on a new clean surface (e.g., second clean chair, clean side of a bench) and pull off boot covers, taking care not to contaminate pants legs.

Airborne Precautions

Airborne precautions, or airborne isolation, is used for diseases that are spread by airborne droplet nuclei. Airborne isolation consists of the following:

- Place the patient in an airborne infection isolation room as soon as possible.
- Place patients with the same pathogen together, if airborne infection isolation rooms are not available.
- Keep the door to the airborne infection isolation room closed when not entering and leaving.
- If an airborne infection isolation room is not immediately available, put a surgical/procedure mask on the patient and place him or her in an examination room that is physically separated from others.
- Negative-pressure functioning of the airborne infection isolation room must be verified before the patient can be placed in the room.
- Wear an N95 or greater protection respirator for each patient encounter.
- Limit patient transport outside of the room.
- Have the patient wear a surgical/procedure mask any time he or she is not in the airborne infection isolation room.

The "N" in N95 respirator stands for "not resistant to oils" and the number represents how much of the agent is filtered. An N95 can filter out 95% of airborne infectious particles.⁶

Respiratory Protection

Respiratory protection measures require the use of common surgical or procedure masks and N95 respirators. Disposable N95 respirators are used for patients who are on airborne precautions in healthcare settings. Common surgical or procedure masks are not respirators and are not completely protective against airborne diseases. Surgical masks are used for patients on droplet isolation and as part of respiratory hygiene.

Fit Testing and User Seal Check

A disposable N95 respirator must be individually fit-tested before use to determine proper size. This procedure takes about 30 minutes and must be conducted by a qualified tester. The healthcare organization's respiratory protection program administrator will arrange for initial and annual fit tests for healthcare workers. In addition to annual fit-testing, healthcare workers must perform a user seal check each time an N95 respirator is used.

User Seal Check

The user seal check is the process of verifying the fit of an N95 respirator before each use. Follow the manufacturer's user seal check recommendations. In general, expect to:

1. Apply the N95 respirator.
2. Forcefully inhale and exhale several times. You should notice the respirator collapse slightly on inhalation and expand with exhalation.
3. Check to see if you feel or hear air leaking out of the face-to-facepiece seal.

Rarely, instances may arise in which a healthcare worker may require more extensive respiratory protection, such as during a bronchoscopy involving a patient with confirmed tuberculosis infection. In that case, consider using a full facepiece respirator. Consult your facility policies and procedures as well as your facility's infection control department for more information.

Guidelines for Using Respiratory Protection

The safe and effective use of masks and respirators are important measures to help prevent the spread of infectious disease. Changes in facial hair or body weight may change the fit of the N95 respirator. Fit-testing is required each time a change in facial hair or body weight occurs. Additional measures for infection control practices include:

- Using a new mask or N95 respirator every time you enter a patient's room and discarding it when leaving the room
- Not dangling a mask around the neck for reuse later
- Making sure the mask or N95 respirator covers both the nose and mouth
- Removing the mask or respirator from behind the head by grasping the straps and pulling it away from the face
- Not removing the mask or respirator while in the room with a patient on droplet or airborne isolation
- Discarding the mask or respirator in a standard waste container

Droplet Precautions

Droplet precautions, or droplet isolation, are used for diseases that are spread by respiratory droplets. Droplet isolation consists of the following:

- Place the patient in a private room when available.
- Place patients with the same pathogen together, if private rooms are not available.
- Maintain at least 3 feet between beds in multi-patient rooms.
- Wear a common surgical or procedure mask for each patient encounter.
- Limit patient transport outside of the room.

Respiratory Hygiene

Respiratory hygiene, also called cough etiquette, refers to actions taken to prevent the spread of illnesses caused by respiratory droplets in the healthcare setting. Respiratory hygiene measures are targeted to patients and accompanying family members or friends, but they also apply to any person with signs of a cold or other respiratory infection, such as cough, congestion, or increased production of respiratory secretions.

Respiratory hygiene measures consist of the following:

- Monitor all patients and visitors for signs and symptoms of respiratory illness.
- Offer a mask to anyone showing signs of respiratory infection.
- Implement spatial separation in common waiting areas.
- Educate patients and visitors about cough etiquette.
- Teach patients and staff to cough into their elbow or onto a sleeve and not into their hands (to avoid contaminating the hands with respiratory secretions).

Practice respiratory hygiene at all times, not only during outbreaks and disasters.

Sequence for Donning and Removing Personal Protective Equipment

	Donning Personal Protective Equipment	Removing Personal Protective Equipment
Step 1	Gown	Gloves
Step 2	Respiratory protection	Goggle or face shield
Step 3	Goggles or face shield	Gown
Step 4	Gloves	Respiratory protection

Summary

Healthcare-associated infections have a significant impact on patient outcomes, including length of stay, cost, morbidity, and mortality. Prevention of many healthcare-associated infections can be accomplished by following the CDC's Guidelines for Isolation Precautions. The isolation guidelines should be included in patient education. Staff should be regularly reeducated about these guidelines so they can practice them in their work environments.

The Joint Commission looks for compliance with the guidelines as a part of assessing the Infection Prevention and Control Standards.

Glossary

Airborne droplet nuclei:

Tiny infectious particles (smaller than or equal to 5 microns in size) that are expelled when infected patients sneeze, cough, talk, or breathe. Because of their small size, droplet nuclei can travel far distances on wind and air currents.

Airborne isolation:

Isolation precautions needed for diseases that are spread through airborne droplet nuclei.

Airborne infection isolation room:

A room that has been constructed with engineering controls to prevent the transmission of disease spread by airborne transmission. Rooms must have certain air exchange rates per hour and meet airflow and ventilation specifications. Some healthcare facilities may call these rooms **negative pressure** rooms, but there are more requirements for an airborne infection isolation room than having negative pressure in relation to the corridor.

Respiratory droplets:

Large, heavy drops that are released from the respiratory tract via the nose or mouth when infected people sneeze, cough, talk, or breathe. They generally fall within 6 to 10 feet of an infected individual.

Transmission-based precautions:

The implementation of infection prevention strategies or isolation in addition to Standard Precautions. There are three categories of Transmission-Based Precautions: airborne, droplet, and contact. A Transmission-Based Precaution category is chosen based on the likely transmission route of the infectious agent.

Cough etiquette:

Interventions used to prevent the spread of infection from diseases transmitted by droplet nuclei or respiratory droplets when people cough. Cough etiquette consists of (a) covering the nose and mouth when coughing or sneezing, (b) using facial tissues when sneezing or coughing and then immediately disposing them in a trashcan, and (c) performing hand hygiene immediately after any contact with respiratory secretions or someone showing symptoms of respiratory illness.

Contact isolation:

Isolation precautions needed for diseases spread by direct and indirect contact.

Droplet isolation:

Isolation precautions needed for diseases that are spread through inhalation or contact with respiratory droplets.

Spatial separation:

Keeping at least 3 feet between infected or symptomatic individuals and uninfected or asymptomatic individuals in common areas such as hospital waiting rooms.