

Isolation Precautions: Personal Protective Equipment (Ambulatory) – CE

ALERT

Don a gown that is impervious to moisture when there is a risk for excess soiling.³

Wash hands or use an alcohol-based hand rub (ABHR) immediately after removing all personal protective equipment (PPE).³

Place patients who require airborne isolation in a negative-pressure airborne infection isolation room (AIIR).³

Don appropriate personal protective equipment (PPE) based on the patient's signs and symptoms and indications for isolation precautions.

OVERVIEW

When a patient has a known or suspected source of colonization or infection, health care team members must follow specific infection prevention and control practices to reduce the risk of cross-contamination to other patients and health care team members. Body substances (e.g., feces, urine, mucus, wound drainage) contain potentially infectious organisms. Isolation or barrier precautions include the appropriate use of PPE, such as a gown, mask, eye protection, and gloves. Health care team members must evaluate the need for barrier precautions for each planned task and for each patient, regardless of the diagnoses. Increased attention to the prevention of blood-borne pathogens and airborne pathogens, such as tuberculosis (TB), has led to the stressed importance of barrier protection.

Published guidelines for isolation precautions contain recommendations based on current epidemiologic information regarding disease transmission in health care settings. Organizations should modify the recommendations based on their specific needs and as dictated by federal, state, or local regulations.³

Standard precautions, or tier one precautions, assume that every patient is potentially infected or colonized with an organism that could be transmitted in the health care setting. The health care team member should apply standard precautions when caring for patients ([Box 1](#)).³ Standard precautions are the primary strategies for preventing infection transmission and apply to contact with blood, bodily fluids, nonintact skin, and mucous membranes, as well as equipment or surfaces contaminated with potentially infectious materials. The strategy for respiratory hygiene and cough etiquette applies to any person with signs of respiratory infection (i.e., cough, congestion, rhinorrhea, increased production of respiratory secretions) when entering a health care facility. Key elements of respiratory hygiene education for health care team members, patients, and visitors include covering the mouth and nose with a tissue when coughing and properly discarding used tissues.

Second tier precautions include transmission-based precautions designed for the care of a patient who is known or suspected to be infected, or is colonized with highly transmissible or epidemiologically important pathogens for which additional precautions are needed to prevent transmission ([Table 1](#)).³ Organisms may be transmitted by contact, droplet, or airborne route or by contact with contaminated surfaces. The three types of transmission-based precautions—airborne, droplet, and contact—may be combined for diseases that have multiple routes of transmission (e.g., chickenpox) ([Table 1](#)).³ Whether used singly or in combination, the precautions should be employed in conjunction with standard precautions.

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EDUCATION

- Explain the purpose of the isolation to the patient.
- Teach the patient appropriate use of barrier techniques for home care, as applicable.
- Provide developmentally and culturally appropriate education based on the desire for knowledge, readiness to learn, and overall neurologic and psychosocial state.
- Encourage questions and answer them as they arise.

PROCEDURE

1. Perform hand hygiene.
2. Verify the correct patient using two identifiers.
3. Review the patient's medical history (if available) for possible indications of isolation, such as risk factors for TB, a major draining wound, diarrhea, or a purulent productive cough.
4. Review the precautions for the specific isolation criteria, including appropriate PPE to apply ([Box 1](#)) ([Table 1](#)).
5. Review the patient's laboratory test results, if applicable.
6. Determine whether the patient has a known latex allergy.
7. Determine if the patient needs to be moved to a negative-pressure AIIR.
8. Provide proper PPE access and signage as needed.
9. Prevent extra trips in and out of the room; gather all needed equipment and supplies before entering the room.
10. Dedicate medical equipment (i.e., stethoscope, blood pressure cuff, and thermometer) to be used only by the patient.³
11. Choose a barrier protection that is appropriate for the type of isolation used and the organization's practice ([Box 1](#)) ([Table 1](#)).

- a. Contact precautions: Standard precautions plus gloves and gown
- b. Droplet precautions: Standard precautions plus a mask
- c. Airborne precautions: Standard precautions plus an N95 respirator or powered air-purifying respirator (PAPR)

12. Perform hand hygiene.
13. Don an isolation gown.

- a. Ensure that the gown covers the torso from the neck to the knees and from the arms to the end of the wrists and that it wraps around the back.
- b. Pull the sleeves of the gown down to the wrists.
- c. Fasten the gown securely at the back of the neck and the waist.

Rationale: Donning a gown properly prevents the transmission of infection and provides protection if the patient has excessive drainage or discharge.

14. Don either a procedure mask or a fitted N95 respirator around the mouth and nose.

- a. Secure the ties or elastics at the middle of the head and neck or the elastic ear loops around the ears.
- b. Fit the flexible band to the nose bridge.
- c. Ensure that the mask fits snugly on the face and below the chin.

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d. If using a PAPR, follow the manufacturer's instructions for use.

Rationale: Donning the correct mask properly reduces the risk of exposure to airborne microorganisms or exposure to microorganisms from splashing fluids.

15. Don eye protection (goggles or face shield), if needed, around the face and eyes. Adjust to fit.

Rationale: Donning eye protection properly reduces the risk of exposure to microorganisms that may occur from splashing fluids.

16. Don gloves, bringing the glove cuffs over the edge of the gown sleeves.

17. Enter the patient's room and arrange the supplies and equipment.

18. Introduce yourself to the patient.

19. Verify the correct patient using two identifiers.

20. Explain the procedure to the patient and ensure that he or she agrees to treatment.

21. Provide designated care to the patient while maintaining precautions.

a. Keep hands away from own face.

b. Limit touching surfaces in the room.

c. Remove gloves when torn or heavily contaminated, perform hand hygiene, and don a clean pair of gloves.

22. Administer medications while maintaining precautions as ordered.

a. Provide oral medication in a wrapper or cup and then discard the wrapper or cup in the proper trash receptacle within the patient's room.

Rationale: Single-use medication containers minimize the transfer of microorganisms.

b. Wear gloves when administering injections.

Rationale: Gloves act as a barrier to reduce the risk of exposure to blood.

c. Discard disposable syringes and uncapped or sheathed needles in the proper sharps receptacle.

Rationale: Properly disposing of sharps reduces the risk of a needlestick injury.

d. Place the reusable syringe holder, if used, in a clean glove or on a paper towel for eventual removal and disinfection after leaving the patient's room.

23. Collect any ordered specimens.

a. In the presence of the patient, label the specimen per the organization's practice.²

b. Prepare the specimen for transport. Place the labeled specimen in a biohazard bag.

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24. Discard linen, trash, and disposable items.

a. Use single bags that are sturdy and impervious to moisture to contain soiled articles. Double-bag heavily soiled linen or heavy, wet trash if necessary.

Ensure that linens or waste are totally contained to protect health care team members from exposure to infectious organisms.

b. Tie the bags securely at the top with a knot.

25. Remove all reusable pieces of equipment and thoroughly disinfect reusable equipment brought into the room. Ensure that equipment is disinfected with an organization-approved disinfectant when it is removed from the room and before it is used on another patient.

Rationale: Disinfecting equipment after use decreases the risk of infection transmission. Using equipment that is dedicated for use only with the patient on isolation precautions further minimizes this risk.³

26. Inform the patient when you plan to return to the room. Ask whether the patient requires any personal care items or has any questions.

27. Remove PPE before exiting the patient's room except for the N95 respirator or PAPR (if worn). Remove the N95 respirator or PAPR after leaving the patient's room and closing the door.

Option 1: Removal of PPE, if using a nondisposable or disposable gown

a. Remove gloves.

If hands become contaminated during glove removal, immediately wash them or use an ABHR.

i. Using a gloved hand, grasp the palm area of the other gloved hand and peel off the first glove.

ii. Hold the removed glove in the gloved hand.

iii. Slide the fingers of the ungloved hand under the remaining glove at the wrist.

iv. Peel the second glove off over the first glove.

Rationale: Properly removing gloves prevents contact with the contaminated gloves' outer surface.

b. Discard gloves in the proper container.

c. Remove eye protection from the back by lifting the headband or earpieces.

d. Discard eye protection in the proper container or place it in an appropriate container for disinfection.

Rationale: The outside of the eye protection is contaminated. Handling as described allows removal without contaminating hands.

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e. Remove gown.

- i. Unfasten the gown's neck ties and waist ties, taking care that the sleeves do not make contact with the body when reaching for the ties.
- ii. Pull the gown away from the neck and shoulders, touching the inside of the gown only.
- iii. Turn the gown inside-out and fold it into a bundle.

Rationale: The front of the gown and sleeves are contaminated. Removing the gown as described prevents contact with the contaminated front of the gown.

- f. Place the gown in a laundry bag or discard disposable gown in the proper container.
- g. Remove the eye protection and mask or face shield. Untie the bottom of the mask or face shield first, untie the top of the mask or face shield next, then pull the mask or face shield away from the face.

Do not touch the outer surface of the mask or face shield.

Rationale: The front of the mask is contaminated. Touching only the elastic or mask strings protects ungloved hands from contamination. Untying the bottom mask string first prevents the top part of the mask from falling down over the health care team member's uniform.

- h. Discard the eye protection and mask or face shield in the proper receptacle or place it in an appropriate container for disinfection.
- i. Perform hand hygiene.

Option 2: Removal of PPE, if using a disposable gown

- a. Remove gown and gloves.

If hands become contaminated during glove removal, immediately perform hand hygiene with soap and water or use an ABHR.

- i. Grasp the gown in the front and pull it away from the body so that the ties break; touch the outside of the gown only with gloved hands.
- ii. While removing the gown, fold or roll it inside-out into a bundle, peeling off the gloves at the same time, touching only the inside of the gloves and gown with bare hands.

Rationale: The front of the gown and sleeves are contaminated. Removing the gown as described prevents contact with the contaminated front of the gown.

- b. Discard the gown and gloves in the proper receptacle.
- c. Remove eye protection and mask or face shield. Untie the bottom of the mask or face shield first, untie the top of the mask or face shield next, then pull the mask or face shield away from the face.

Do not touch the outer surface of the mask.

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Rationale: The front of the mask is contaminated. Touching only the elastic or mask strings protects ungloved hands from contamination. Untying the bottom mask string first prevents the top part of the mask from falling down over the health care team member's uniform.

d. Discard the eye protection and mask or face shield in the proper receptacle or place it in an appropriate container for disinfection.

Rationale: The outside of the eye protection is contaminated. Handling as described allows removal without contaminating hands.

28. Perform hand hygiene.

29. Leave the room and close the door, if the patient is in a negative-pressure AIIR.

30. If the patient is in airborne isolation, remove the N95 respirator or PAPR.

a. To remove the mask, grasp the bottom ties or elastics and then the top ties or elastics and pull the mask away from the face.

Do not touch the outer surface of the mask.

Rationale: The front of the mask is contaminated. Touching only the elastic or mask strings protects ungloved hands from contamination. Untying the bottom mask string first prevents the top part of the mask from falling down over the health care team member's uniform.

b. If the patient is on contact and airborne isolation, discard the N95 respirator in the proper waste container.

Rationale: Humidity, dirt, and crushing reduce the efficiency of the mask.

c. Place the reusable N95 respirator in a labeled paper bag for reuse by the same person per the organization's practice. N95 respirators can be reused when supplies are limited (e.g., influenza pandemics or widespread outbreaks of other respiratory illnesses).¹

Rationale: Reusable storage bags keep equipment contaminant-free and should be labeled to prevent more than one person from wearing the mask. A damaged or crushed mask may not seal properly.

Use caution not to crush the mask. Do not leave the mask hanging around the neck.

d. Remove, disinfect, and store the PAPR per the manufacturer's instructions for use.

e. Perform hand hygiene.

31. Transport the specimen to the laboratory per the organization's practice.

32. Perform hand hygiene.

33. Document the procedure in the patient's record.

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EXPECTED OUTCOMES

- Patient asks for information about disease transmission.
- Patient can explain the purpose of isolation and cooperates with precautions.

UNEXPECTED OUTCOMES

- Patient avoids social and therapeutic discussions.
- Patient does not cooperate with precautions.

DOCUMENTATION

- Education
- Procedures performed
- Evidence of or suspected breach of isolation precautions
- Unexpected outcomes and related interventions

PEDIATRIC CONSIDERATIONS

- Isolation creates a sense of separation from family and a loss of control. A strange environment may add to any confusion the child feels during isolation. A preschool-age child is unable to understand the cause-and-effect relationship for isolation. Older children may be able to understand the cause, but they still may be frightened.
- A child requires simple explanations, for example, “You need to be in this room to help you get better.”
- Ensure that the child’s family is actively involved in any explanations.
- All isolation precautions should be shown to the child. Health care team members should let the child see their faces before applying the mask so that he or she does not become frightened.

OLDER ADULT CONSIDERATIONS

- Many older adults become confused when they are confronted with a health care team member using barrier precautions or when left in a room with the door closed. The need for closing the door (negative-pressure AIIR), along with the patient’s safety and additional safety measures, should be evaluated.

REFERENCES

1. Centers for Disease Control and Prevention (CDC). (2018). Pandemic planning: Recommended guidance for extended use and limited reuse of N95 filtering facepiece respirators in healthcare settings. Retrieved March 11, 2020, from <https://www.cdc.gov/niosh/topics/hcwcontrols/recommendedguidanceextuse.html> (Level VII)
2. Joint Commission, The. (2020). National patient safety goals: Ambulatory health care accreditation program. Retrieved March 11, 2020, from https://www.jointcommission.org/assets/1/6/NPSG_Chapter_AHC_Jan2020.pdf (Level VII)
3. Siegel, J.D. and others. (2007, updated 2019). 2007 Guideline for isolation precautions: Preventing transmission of infectious agents in healthcare settings. Retrieved March 11, 2020, from <https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf> (Level VII)

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Elsevier Skills Levels of Evidence

- **Level I** - Systematic review of all relevant randomized controlled trials
- **Level II** - At least one well-designed randomized controlled trial
- **Level III** - Well-designed controlled trials without randomization
- **Level IV** - Well-designed case-controlled or cohort studies
- **Level V** - Descriptive or qualitative studies
- **Level VI** - Single descriptive or qualitative study
- **Level VII** - Authority opinion or expert committee reports

Supplies

- Impervious linen bag and waste receptacles
- PPE (as needed for specific type of isolation required)
- Other patient care equipment as appropriate (e.g., personal hygiene items, medications, dressing change supplies, specimen collection containers)
- Sign for door indicating type of isolation and required PPE

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Box 1 Centers for Disease Control and Prevention Isolation Guidelines Standard Precautions (Tier One) for Use with All Patients

- Standard precautions apply to blood, blood products, all bodily fluids, secretions, excretions (except sweat), nonintact skin, and mucous membranes.
- Perform hand hygiene before direct contact with patients and after direct contact with a patient's skin.
- Perform hand hygiene after contact with blood, bodily fluids, mucous membranes, nonintact skin, secretions, excretions, or wound dressings; after contact with inanimate surfaces or medical equipment in the immediate vicinity of the patient; and immediately after removing gloves.
- When hands are visibly soiled or contaminated with blood or bodily fluids, wash hands with either a nonantimicrobial soap and water or an antimicrobial soap and water.
- When hands are not visibly soiled or contaminated with blood or bodily fluids, use an alcohol-based hand rub to decontaminate the hands or wash hands with an antimicrobial soap and water.
- Wash hands with nonantimicrobial soap and water or an antimicrobial soap and water if contact with spores (e.g., *Clostridium difficile*) is likely to have occurred. Alcohols, chlorhexidine, iodophors, and other antiseptic agents have poor activity against spores.
- Do not wear artificial fingernails or extenders if duties include direct contact with patients at high risk for infection and associated adverse outcomes (e.g., ICU, OR settings).

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- Wear gloves when it is likely that contact with blood, bodily fluids, secretions, excretions, nonintact skin, mucous membranes, or contaminated intact skin (e.g., patient incontinent of stool or urine) or items or surfaces is likely. Remove gloves and perform hand hygiene between patient care encounters and when going from a contaminated to a clean body site (e.g., face).
- Wear a gown when it is likely that contact with blood, body fluids, secretions, excretions, nonintact skin, mucous membranes, or contaminated intact skin or items or surfaces could occur.
- Remove gown and perform hand hygiene between patient care encounters. Do not reuse gowns, even for repeated contacts with the same patient.
- Routine donning of gowns upon entrance into high risk units is not indicated.
- Wear mouth, nose, and eye protection when the anticipated patient care activities that are likely to generate splashes or sprays of blood or bodily fluids, secretions, and excretions.
- Select masks, goggles, face shields, and combinations of each based on the task performed and the agent the patient is suspected of being infected with (e.g., *M. tuberculosis*, SARS, or hemorrhagic fever viruses).
- Respiratory hygiene and cough etiquette—have patients and accompanying individuals:
 - Cover the nose and mouth, or both when coughing or sneezing.
 - Use tissues to contain respiratory secretions and dispose in nearest no-touch waste container.
 - Perform hand hygiene after contacting respiratory secretions and contaminated objects or materials.
 - Contain respiratory secretions with procedure or procedure mask for coughing or other symptomatic patients.
 - Sit at least 91.4 cm (3 ft) away from others if coughing.
- Wear PPE (e.g., gloves, gown), according to the level of anticipated contamination, when handling patient care equipment and instruments/devices that are visibly soiled or may have been in contact with blood or body fluids.
- Discard all contaminated sharp instruments and needles in a puncture-resistant container. Health care agencies must make available needleless devices. Any needles should be disposed of uncapped, or a mechanical safety device must be activated for recapping.
- Infection control practices for special lumbar puncture procedures: Wear a procedure mask when placing a catheter or injecting material into the spinal canal or subdural space (i.e., during myelograms, lumbar puncture, and spinal or epidural anesthesia).

See next page for Table 1: Centers for Disease Control and Prevention Isolation Guidelines Transmission-Based Precautions (Tier Two) for Use with Specific Types of Patients

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Table 1 Centers for Disease Control and Prevention Isolation Guidelines Transmission-Based Precautions (Tier Two) for Use with Specific Types of Patients

Category	Infection or condition	Barrier protection
Airborne precautions (droplet nuclei smaller than 5 microns)	Measles, chickenpox (varicella), disseminated varicella zoster, pulmonary or laryngeal tuberculosis	<p>Negative-pressure airflow of at least 6 to 12 exchanges per hour via HEPA filtration</p> <p>Wear a fit-tested NIOSH-approved N95 or higher-level respirator for respiratory protection when entering the room or home of a patient when these diseases are suspected or confirmed: infectious or laryngeal tuberculosis, smallpox.</p> <p>Private room or cohort patients with same isolation precautions or infection.</p> <p>Patients may be transported out of room for procedures or therapy if necessary; patient to don a procedural mask and follow respiratory hygiene and cough etiquette. For patients with skin lesions associated with varicella or smallpox or draining skin lesions caused by <i>M. tuberculosis</i>, cover the affected area to prevent aerosolization or contact with the infectious agent in the skin lesion.</p> <p>Health care team members transporting patients who are on Airborne Precautions do not need to wear a mask or respirator during transport if the patient is wearing a mask and infectious lesions are covered.</p>
Droplet precautions (respiratory droplets larger than 5 micrometers that are generated by a patient who is coughing, sneezing or talking)	Diphtheria (pharyngeal), rubella, streptococcal pharyngitis, pneumonia or scarlet fever in infants and young children, pertussis, mumps, mycoplasma pneumonia, meningococcal pneumonia or sepsis, pneumonic plague	<p>Mask or respirator required depending on condition per the organization's practice</p> <p>Private room or cohort patients with same isolation precautions or infection.</p>

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Transmission-Based Precautions (Tier Two) for Use with Specific Types of Patients

Category	Infection or condition	Barrier protection
Contact precautions (direct patient or environmental contact)	Colonization or infection with multidrug-resistant organisms such as VRE and MRSA, <i>Clostridium difficile</i> , <i>Shigella</i> , and other enteric pathogens; major wound infections; herpes simplex; scabies; varicella zoster (disseminated); respiratory syncytial virus in infants, young children, or immunocompromised adults	Mask if splashing will occur Private room or cohort patients with same isolation precautions or infection.
Protective environment	Allogeneic hematopoietic stem cell transplants	Positive airflow with 12 or more air exchanges per hour; HEPA filtration for incoming air; mask to be worn by patient when in public environments
Ebola precautions	Patients suspected of or diagnosed with Ebola	Negative-pressure airflow of at least six to 12 exchanges per hour via HEPA filtration; mask or respiratory protection device (N95 respirator or PAPR) required; waterproof PPE; no skin exposed when inside patient's room

HEPA, high-efficiency particulate air; MRSA, methicillin-resistant *Staphylococcus aureus*; PPE, personal protective equipment; VRE, vancomycin-resistant enterococcus

(Modified from Siegel, J.D. and others. [2007, updated 2019]. 2007 Guideline for isolation precautions: Preventing transmission of infectious agents in healthcare settings. Retrieved March 11, 2020, from <https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf>)