

Isolation Precautions: Droplet (Pediatric) - CE

ALERT

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

Perform hand hygiene with soap and water or use an alcohol-based hand sanitizer immediately after removing all PPE.⁴

Avoid physical contact with the patient before donning appropriate PPE.¹

OVERVIEW

Infection prevention and control measures help to ensure the protection of patients in a range of settings who may be vulnerable to acquiring an infection both in the general community and when receiving care because of health problems.

Infection-control practices that reduce and eliminate sources of infection transmission help to protect patients and health care team members from disease. The health care team member is responsible for educating the patient about infection control. Knowledge of the infectious process, disease transmission, and critical-thinking skills associated with use of aseptic techniques and barrier protection is essential for both health care team members and patients.

Droplet transmission is a form of contact transmission when some form of infectious agent is transmitted by droplet route (direct or indirect contact). However, in contrast to contact transmission, respiratory droplets carrying infectious pathogens transmit infection when they travel directly from the infectious person's respiratory tract (e.g., coughing, sneezing, talking) to the recipient's susceptible mucosal surfaces, generally over short distances.⁴

Health care team members working with patients who have an illness that can be transmitted via droplet route (e.g., influenza) should don a mask when within 1.8 to 3 m (6 to 10 ft) of the patient or upon entry into the patient's room.⁴ The difference between droplet precautions and airborne precautions is related to the size of the particle. With droplet-transmitted pathogens, the particle is greater than 5 micrometers⁴ and does not hang suspended in air. Airborne-transmitted pathogens are less than 5 micrometers and are able to hang suspended in the air for long periods of time. Airborne precautions require special air handling and ventilation.⁴

Standard precautions, or tier one precautions, are used based on the assumption that every patient is potentially infected or colonized with a transmissible organism. Standard precautions are primary for preventing infection transmission and apply to contact with blood, bodily fluids, nonintact skin, mucous membranes, equipment or surfaces contaminated with potentially infectious materials.

Respiratory hygiene and cough etiquette should be used by any person entering a health care facility with signs of respiratory infection (e.g., cough, congestion, rhinorrhea, increased production of respiratory secretions). Key elements of respiratory hygiene include proper hand hygiene, covering the mouth and nose with a tissue when coughing or sneezing, coughing or sneezing into the elbow, wearing a mask, and properly discarding used tissues.

Health care team members must participate in and practice rigorous training of current PPE recommendations, which include the systematic donning and doffing of PPE. Once in the

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isolation room, PPE must remain in place and worn correctly. A breach may include skin exposure, a needlestick, or a tear in the PPE. Removing or adjusting PPE while in the procedure room increases the risk of contamination. The doffing process is a time of high risk, and a systematic procedure must be followed.¹

EDUCATION

- Provide developmentally and culturally appropriate education based on the desire for knowledge, readiness to learn, and overall neurologic and psychosocial state.
- Explain the purpose of the isolation to the patient and family.
- Incorporate play when explaining the use of PPE to a toddler or young child (e.g., superheroes).
- Give the patient and family information on the signs and symptoms of infections transmitted via the droplet route.
- Explain to the patient and family about strategies for infection prevention (e.g., hand hygiene, use of PPE).
- Emphasize to the family the importance of PPE despite exposure to the patient prior to admission.
- Encourage questions and answer them as they arise.

ASSESSMENT AND PREPARATION

Assessment

1. Perform hand hygiene before patient contact.
2. Review the patient's medical history, if available, for possible indications for isolation.
3. Review the precautions for the specific isolation criteria, including appropriate PPE to apply ([Box 1](#)) ([Table 1](#)).

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).
- 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

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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, bodily 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 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 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 or devices that are visibly soiled or may have been in contact with blood or bodily fluids.
- Discard all contaminated sharp instruments and needles in a puncture-resistant container. Health care facilities must make needleless devices available. 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).

ICU, intensive care unit; OR, operating room; PPE, personal protective equipment; SARS, severe acute respiratory syndrome

(Modified from Siegel, J.D. and others. [2007, updated 2019]. 2007 Guideline for isolation precautions: Preventing transmission of infectious agents in healthcare settings. Retrieved April 1, 2020, from <https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf>)

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

Table 1: Centers for Disease Control and Prevention Isolation Guidelines Transmission-Based Precautions (Tier 2) for Use with Specific Types of Patients		
Category	Infection or condition	Barrier protection
Airborne precautions (droplet nuclei smaller than 5 microns)	Rubeola (measles), chickenpox, tuberculosis, coronavirus	Negative-pressure room with airflow of at least 6 to 12 exchanges per hour via HEPA filtration

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		<p>A fit-tested NIOSH-approved N95 or higher-level respirator</p> <p>Gown, gloves, and eye protection</p> <p>A surgical mask on the patient being transported out of isolation room</p>
<p>Droplet precautions (respiratory droplets larger than 5 micrometers that are generated by a patient who is coughing, sneezing or talking)</p>	<p>Diphtheria (pharyngeal), rubella, streptococcal pharyngitis, pneumonia, scarlet fever, pertussis, mumps, meningococcal pneumonia, or sepsis</p>	<p>Mask</p> <p>Private room</p> <p>Gown, gloves, and eye protection if contact is expected</p>
<p>Contact precautions (direct patient or environmental contact)</p>	<p>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); RSV</p>	<p>Gown and gloves</p> <p>Mask and eye protection if splashing is expected</p> <p>Private room</p>
<p>Protective or reverse isolation</p>	<p>Immunocompromised patients</p>	<p>Positive pressure room with airflow with 12 or more air exchanges per hour; HEPA filtration for incoming air</p> <p>Mask and gloves</p> <p>Mask to be worn by patient when in public environments</p>

HEPA, high-efficiency particulate air; MRSA, methicillin-resistant *Staphylococcus aureus*; NIOSH, National Institute for Occupational Safety and Health; RSV, respiratory syncytial virus; 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 April 1, 2020, from <https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf>)

4. Review the patient’s laboratory test results, if applicable.
5. Determine whether the patient has a known latex allergy.
6. Determine if the patient needs to be moved to a negative-pressure airborne infection isolation room.

Preparation

1. Choose isolation precautions that are appropriate for the patient’s signs and symptoms or diagnosis ([Box 1](#)) ([Table 1](#)).

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- 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)
2. Provide proper PPE access and signage as needed.
 3. Prevent extra trips in and out of the room; gather all needed equipment and supplies before entering the room.
 4. Provide dedicated equipment (e.g., stethoscope, blood pressure cuff, thermometer) to be used only by the patient.⁴

PROCEDURE

1. Perform hand hygiene.
2. 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.

3. Don a mask around the mouth and nose.
 - a. Secure the ties or elastic bands 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.
4. Don eye protection (i.e., 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.

5. Don gloves, bringing the glove cuffs over the edge of the gown sleeves.
6. Enter the isolation room, close the door, and arrange the supplies and equipment.
7. Introduce yourself to the patient and family.
8. Verify the correct patient using two identifiers.
9. Explain the procedure to the patient and family and ensure that the patient agrees to treatment.
10. Provide 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 clean gloves.
 - d. If supplies are needed, enlist another health care team member to hand in new supplies without entering the room.

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11. Collect any ordered specimens.

- a. In the presence of the patient, label the specimen per the organization's practice.³
- b. Place the labeled specimen in a biohazard bag.

12. At the door, have another health care team member hold a biohazard bag into which the specimen is placed.

Rationale: This prevents contamination of the outside of the biohazard bag.

13. Discard supplies.

At the completion of the procedure, ensure that all choking hazards (e.g., syringe caps, port caps, adhesive bandages, bits of tape, twist-off caps from saline bullets) are removed from the patient's linens and placed in the appropriate receptacle.

14. After providing patient care, doff PPE in a designated area by the door or in an anteroom. If an anteroom is in use, leave the isolation room and close the door to doff PPE.

Doffing PPE Option 1: Removal of PPE, if Using a Reusable Gown

1. Remove gloves.

If hands become contaminated during glove removal, or any other step in the PPE doffing procedure, immediately perform hand hygiene.

- a. Using a gloved hand, grasp the palm area of the other gloved hand and peel off the first glove.
- b. Hold the removed glove in the gloved hand.
- c. Slide the fingers of the ungloved hand under the remaining glove at the wrist.
- d. Peel the second glove off over the first glove.

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

2. Discard gloves in the proper receptacle.

3. Remove eye protection from the back by lifting the headband or earpieces. Discard eye protection in the proper container or place in an appropriate container for disinfection.

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

4. Remove the gown.

- a. 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.
- b. Pull the gown away from the neck and shoulders, touching only the inside of the gown.
- c. Turn the gown inside-out and fold it into a bundle.

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

- d. Place the gown directly into a designated laundry receptacle.
5. Remove the face mask.
- a. Remove the elastic loops from the ears and pull the mask away from the face or untie the bottom ties or grasp the bottom elastics and then the top ties or elastics and pull the mask away from the face. Discard the mask in the proper receptacle.
 - b. For reuse, leave the patient care area and carefully fold the face mask, keeping the outer surface held inward and against itself to reduce contact with the outer surface during storage. Store the mask between uses in a clean, sealable paper bag or breathable container.²

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.

6. Perform hand hygiene.
7. Leave the room and close the door.
8. Ensure that specimens have been transported to the laboratory per the organization's practice.
9. Document the procedure in the patient's record.

Option 2: Removal of PPE, if Using a Disposable Gown

1. Remove gown and gloves.

If hands become contaminated during glove removal, or any other step in the PPE doffing procedure, immediately perform hand hygiene.

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

2. Discard the gown and gloves in the proper receptacle.
3. Remove eye protection from the back by lifting the headband or earpieces. Discard eye protection in the proper container.
4. Remove the face mask.

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- a. Remove the elastic loops from the ears and pull the mask away from the face or untie the bottom ties or grasp the bottom elastics and then the top ties or elastics and pull the mask away from the face. Discard the mask in the proper receptacle.
- b. For reuse, leave the patient care area and carefully fold the face mask, keeping the outer surface held inward and against itself to reduce contact with the outer surface during storage. Store the mask between uses in a clean, sealable paper bag or breathable container.²

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.

5. Perform hand hygiene.
6. Leave the room and close the door.
7. Ensure that specimens have been transported to the laboratory per the organization's practice.
8. Document the procedure in the patient's record.

MONITORING AND CARE

1. Ensure that equipment is disinfected with an organization-approved disinfectant when it is removed from the room, before use on another patient.

EXPECTED OUTCOMES

- Patient and family cooperate with isolation precautions.
- No evidence of breach of isolation precautions occurs.
- Health care team members are free from infection.

UNEXPECTED OUTCOMES

- Patient and family do not cooperate with isolation precautions.
- Breach of isolation precautions exists.
- Health care team member contracts an infection.

DOCUMENTATION

- Education
- Care provided
- Evidence or suspected breach of isolation precautions
- Unexpected outcomes and related interventions

REFERENCES

1. Centers for Disease Control and Prevention (CDC). (2015). Guide to infection prevention for outpatient settings: Minimum expectations for safe care. Retrieved April 1, 2020, from https://www.cdc.gov/hai/pdfs/guidelines/ambulatory-carechecklist_508_11_2015.pdf (Level VII)
2. Centers for Disease Control and Prevention (CDC). (2020). Coronavirus disease 2019 (COVID-19): Strategies for optimizing the supply of facemasks. Retrieved April 1, 2020, from <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html> (Level VII)

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4. Siegel, J.D. and others. (2007, updated 2019). 2007 Guideline for isolation precautions: Preventing transmission of infectious agents in healthcare settings. Retrieved April 1, 2020, from <https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines-H.pdf> (Level VII)

ADDITIONAL READINGS

Centers for Disease Control and Prevention (CDC). (n.d.). Sequence for putting on personal protective equipment (PPE). Retrieved April 1, 2020, from <https://www.cdc.gov/hai/pdfs/ppe/ppe-sequence.pdf>

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

- Dedicated medical equipment (e.g., stethoscope, blood pressure cuff, thermometer)
- Isolation signage as needed
- PPE (gloves, isolation gown, mask, eye protection [i.e., goggles or face shield], as needed)

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