

TRANSMISSION BASED PRECAUTIONS

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**Nebraska Infection
Control Network**



What will we cover?

- Standard versus Transmission-based precautions
- Contact, Droplet, Airborne, Protective Environment, and Enhanced Barrier Precautions
- Horizontal versus Vertical Approaches to preventing spread of HAI
- Patient care setting specific differences

**Transmission
based
precautions**

- Contact Precautions
- Droplet Precautions
- Airborne Precautions
- Protective Environment

**Standard
precautions**

- Hand Hygiene
- Respiratory Hygiene & Cough Etiquette
- Use of PPE
- Safe Work (Sharps)
- Safe Injection Practices
- Environmental cleaning
- Patient placement

Figure is presenter's own, adapted from
Wiksten, T. Standard Precautions. In Boston K.M., et al, eds. APIC Text. 2014. Available at <https://text.apic.org/toc/basic-principles-of-infection-prevention-practice/standard-precautions> Accessed September 2,2022 and Berends, C. Isolation Precautions (Transmission-based Precautions). APIC Text. 2014. Available <https://text.apic.org/toc/basic-principles-of-infection-prevention-practice/isolation-precautions-transmission-based-precautions> Accessed September 2,2022

Standard Precautions

- Perform hand hygiene
- Use PPE whenever there is expectation of possible exposure to infectious material
- Ensure appropriate patient placement
- Properly handle and properly clean and disinfect patient care equipment and instruments/devices
- Clean and disinfect the environment appropriately
- Handle textiles and laundry carefully
- Follow safe injection practices
- Wear a surgical mask when performing lumbar punctures
- Ensure healthcare worker safety including proper handling of needles and other sharps

CDC Standard Precautions for All Patient Care

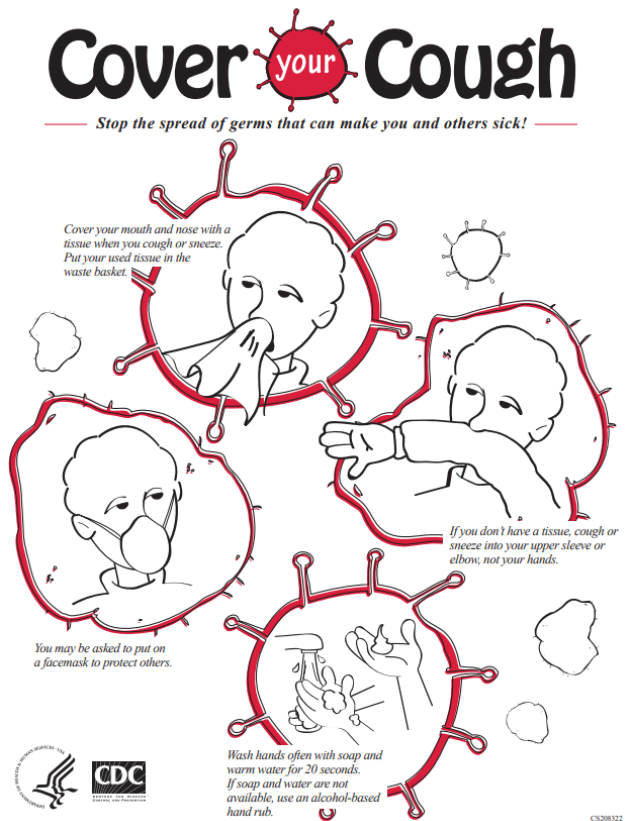
<https://www.cdc.gov/infectioncontrol/basics/standard-precautions.html>

Maximizing the Efficacy of Respiratory Hygiene & Cough Etiquette

Early implementation is key

- It should occur at the first point of entry within a healthcare setting
- Targeted at patients and accompanying significant others
- Applies to any person entering a healthcare setting with signs of respiratory illness including cough, congestion, rhinorrhea, or increased production of respiratory secretions.

Implementation Facets of Respiratory Hygiene and Cough Etiquette



- Educate HCP, patients, and visitors on the signs and symptoms of respiratory illness
- Post signs at facility entries with instructions for prevention of transmission of respiratory illness in languages of the local population
- Ensure easy access and availability of
 - source control measures (tissues, surgical masks) to enable patient and visitors to cover sneezes and coughs and mask persons with a cough
 - hand hygiene located close to other source control supplies including the facility entrance and waiting rooms
- Encourage patients or visitors with respiratory symptoms to sit apart from other people in the waiting room, more than 3 feet apart, or place in a separate area when feasible

Has this ever happened to you?

“Hey Kate, last week I took care of a patient with HIV. There was no infection flag on the chart. Don’t they need precautions? “

Contact Precautions

When to use

- Diseases transmitted by patient contact or contact with the patient environment.
- Diseases which cause heavy environmental contamination such as:
VRE, MRSA, *C. diff*, or RSV in infants, children, and immunosuppressed adults

Methods

- Require gowns and gloves on room entry
- Single room is preferred
- Clean daily with focus on high touch surfaces, patient bathrooms, and areas close to the patient
- Limit patient transport to medically necessary purposes
 - Cover or contain potentially infectious body fluids before transport.
 - Transporter should discard contaminated PPE before transport.
 - Don clean PPE to handle the patient at the destination.

Strategy for use of Contact Precautions in Acute Care

TABLE 2. Potential Components for Inclusion in a Policy for Duration of Contact Precautions With Examples

Components	Examples
Inclusion criteria	Elapsed time since last infection with organism until consideration for discontinuation of CP (ie, 3, 6, 12 months)
Exclusion criteria	Concomitant antibiotic use within a specified period (ie, 24–48 hours prior to sampling), active infection, hospitalization in an outbreak, or hyperendemic period at the facility
No. of surveillance samples	1–3
Surveillance sample source	Nares (MRSA), perirectal (VRE, MDR-E), stool (VRE, MDR-GNR)
Surveillance sample frequency	Daily, weekly, biweekly
Testing methodology	Bacterial culture, molecular testing (eg, PCR)
Final arbiter for discontinuation of CP	Healthcare epidemiologist, infection preventionist, other hospital/ID leadership
Policy implementation strategy	Clinical staff with assistance from the Infection Prevention and Control Program vs active monitoring and implementation led by the Infection Control and Prevention Program

NOTE. CP, contact precautions; MRSA, methicillin-resistant *Staphylococcus aureus*; VRE, vancomycin-resistant enterococci (VRE); PCR, polymerase chain reaction; ID, infectious diseases; MDR-GNR, multidrug-resistant Gram-negative rods; CRE, carbapenem-resistant *Enterobacteriaceae*; ESBL, extended-spectrum β -lactamase

Contact Precautions Outside the Hospital

Ambulatory and Outpatient Settings

- Ensure front desk and rooming staff have access to infection flags
- Place patients in exam rooms as soon as possible

Rehabilitation and Long Term Care Settings

- Resident placement should be handled based on individual needs/ characteristics
 - Presence of draining wounds or secretions that are not contained
 - Incontinence which is not controlled
 - Ability to comply with hand hygiene
- Each facility should make decisions on the basis of infection risks to other residents in the facility.

Droplet Precautions

When to use

- Diseases caused by large respiratory droplets that are generated by coughing, sneezing, or talking.
- Include influenza, pertussis, and bacterial meningitis due to *N. meningitidis*

Methods

- Surgical mask on room entry
- Handle items contaminated with respiratory secretions (e.g., tissues, handkerchiefs) with gloves. Change PPE between patients and perform hand hygiene.
- Single room is preferred
- Clean daily with focus on high touch and horizontal surfaces
- Instruct patients or residents on respiratory hygiene and cough etiquette.
- Limit patient transport outside the room to medically necessary purposes.
 - If the patient must leave the room, instruct the patient to wear a surgical mask and follow respiratory hygiene and cough etiquette.
 - Once the patient is masked, the patient transporter does not need to wear a surgical mask.
 - Notify the receiving department of the isolation precautions status.

Droplet Precautions Outside the Hospital

Ambulatory and Outpatient Settings

- Patients who present with clinical respiratory syndromes should be instructed in the practice of respiratory hygiene and cough etiquette and given surgical masks to wear until an examination room can be provided.
- Place patients requiring Droplet Precautions in an examination room as soon as possible.
- HCP should don surgical masks on room entry.

Rehabilitation and Long Term Care Settings

- Make decisions for resident placement on a case-by-case basis after considering all options.
- Ambulatory residents on Droplet Precautions should be instructed to wear a surgical mask in common areas.
- Restriction from group dining until isolation is discontinued
- Restriction from group activities if mask use is not possible
- All residents should be instructed in the proper use of respiratory hygiene and cough etiquette.

Airborne Precautions

When to use

- Prevent transmission of infectious organisms that remain suspended in the air and travel great distances due to small size
- Concern for transmission of these pathogens in healthcare settings is extended to airflow patterns within the facility
- These diseases include measles, smallpox, chickenpox, pulmonary TB, and avian influenza

Methods

- Place patient in airborne infection isolation room with negative air pressure relative to corridor (AIIR= airborne infection isolation room)
- 6-12 air exchanges per hour
- Air exhausted directly outside
- Monitor the air pressure daily with visual indicators (e.g., smoke tubes, flutter strips) and electronic methods (e.g., maintenance air exchange reports) when possible. Keep the door shut.
- Wear fit-tested NIOSH approved N-95
- Limit transport of patients to essential medical purposes. If transport out of AIIR is necessary
 - Place a surgical mask on the patient and instruct him/her to observe respiratory hygiene and cough etiquette.
 - Do not place an N95 mask on the patient, as this may further hinder their ability to breathe given their compromised respiratory status.
 - Cover exposed skin lesions with clean bandages and/or clean linens.
 - Transport personnel do not need to wear respiratory protection during transport if the patient is masked and all skin lesions are covered.

Airborne Precautions Outside the Hospital

Ambulatory and Outpatient Settings

- Develop protocols to identify patients with known or suspected airborne infections.
- Place the patient requiring Airborne Precautions in AIIR as soon as possible.
- If AIIR is not available, place the patient in an examination room with a portable high-efficiency particulate air (HEPA) filter.
- If no portable HEPA filter is available, ensure that the patient wears a surgical mask.

Rehabilitation and Long Term Care Settings

- Develop protocols to identify residents with known or suspected airborne infections.
- If no portable HEPA filter is available, ensure that the resident wears a surgical mask and room door remains closed as much as possible
- Restrict from group dining and activities

Protective Environment

When to use

- Allogenic hematopoietic stem cell transplant recipients to reduce the risk of invasive environmental fungal infections and other opportunistic pathogens.
- Facilities may choose to implement some of the measures for certain immunocompromised patients. This evaluation is primarily based on a daily absolute neutrophil count (ANC).

Methods

- Filter incoming air with HEPA filtration that is at positive pressure with relation to the corridor at least 12 air exchanges per hour
- Air pressure should be monitored daily with visual indicators (e.g., smoke tubes, flutter strips).
- Clean rooms with techniques that minimize dust
- Avoid upholstered furnishings and carpet in the patient room and hallways
- Prohibit dried and fresh flowers and potted plants
- Patients should receive baths instead of showers due to the aerosolization of potential fungal and bacterial pathogens.
- Limit the time the patient spends outside the Protective Environment.

Isolation For Specific Pathogens

- Control of Communicable Diseases Manual, 21st Edition
APHA Press
- CDC 2007 Guideline for Isolation Precautions:
Preventing Transmission of Infectious Agents in
Healthcare Settings [Isolation Precautions | Guidelines
Library | Infection Control | CDC](#)
- Red Book: 2021–2024 Report of the Committee on
Infectious Diseases (32nd edition)

CONTROL OF MDROS

...it's complicated

Control of drug resistant organisms



Surveillance: such as MDRO incidence and infection rates



Education: should be facility-wide and include rates, trends, & prevention strategies



Administrative Controls: computer alerts to identify previously infected and colonized patients, PPE supplies and easy access, provision of adequate hand washing sinks and alcohol-based hand rub dispensers, and enforcing adherence to hand hygiene and isolation practices

MDRO Tracking and Response



Intervention: Two Schools of Thought

Vertical Approach

- Aim to reduce colonization, infection, and transmission of specific pathogens
- Often uses active surveillance testing to identify carriers
- Measures/practices aim to prevent transmission from carriers to other patients

Horizontal Approach

- Aim to reduce broad array of pathogens
- Implementation of standardized practices
- Measures/practices do not depend on patient-specific conditions

Septimus, E., Weinstein, R. A., Perl, T. M., Goldmann, D. A., & Yokoe, D. S. (2014). Approaches for Preventing Healthcare-Associated Infections: Go Long or Go Wide? *Infection Control & Hospital Epidemiology*, 35(S2).

Wenzel, R. P., & Edmond, M. B. (2010). Infection control: the case for horizontal rather than vertical interventional programs. *International Journal of Infectious Diseases*, 14.

TABLE 1. Preventing Healthcare-Associated Infections: Examples of Vertical and Horizontal Approaches

Vertical approaches reduce risk of infections due to specific pathogens:

- Active surveillance testing to identify asymptomatic carriers
- Contact precautions for patients colonized or infected with specific organisms
- Decolonization of patients colonized or infected with specific organisms

Horizontal approaches reduce risk of a broad range of infections and are not pathogen specific:

- Standard precautions (eg, hand hygiene)
 - Universal use of gloves or gowns and gowns
 - Universal decolonization (eg, chlorhexidine gluconate bathing)
 - Antimicrobial stewardship
 - Environmental cleaning and disinfection
-

SOURCE. Modified from Wenzel and Edmond.³

Septimus, E., Weinstein, R. A., Perl, T. M., Goldmann, D. A., & Yokoe, D. S. (2014). Approaches for Preventing Healthcare-Associated Infections: Go Long or Go Wide? *Infection Control & Hospital Epidemiology*, 35(S2).

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COMMENTARY

Approaches for Preventing Healthcare-Associated Infections: Go Long or Go Wide?

Edward Septimus, MD;¹ Robert A. Weinstein, MD;² Trish M. Perl, MD, MSc;³
Donald A. Goldmann, MD;^{4,5} Deborah S. Yokoe, MD, MPH⁶

In this issue, the
to Prevent Health
Hospitals: 2014

Opinion

VIEWPOINT

Reconsidering Isolation Precautions for Endemic Methicillin-Resistant *Staphylococcus aureus* and Vancomycin-Resistant *Enterococcus*

Daniel J. Morgan, MD,

Gowns, gloves, and hand hygiene are primary tools for from a cluster trial of a related intervention of using

Opinion

VIEWPOINT

Contact Precautions for Endemic MRSA and VRE Time to Retire Legal Mandates

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Physical barriers have been used to prevent infectious diseases dating back to leather gloves and coats used during the Black Death in medieval Europe. In the United States, isolation of persons with infections coincided with the development of infectious disease hospitals during the 19th century and introduction of "barrier nursing" in 1910, which included the use of gowns for health care workers. The US Centers for Disease Control and Prevention (CDC) released isolation manuals starting in 1970, promoting the idea of specific

clinical disease. For example, a cluster randomized trial of active surveillance culturing for MRSA or VRE with application of gloves and gowns and involving 9139 patients identified and isolated 2 to 3 times as many patients needing isolation (38% of patients isolated with clinical culture-based isolation vs 92% with active surveillance and universal glove use) but did not decrease transmission.² Likewise, in another cluster randomized clinical trial, use of gloves and gowns universally in 20 intensive care units (ICUs) and in 20 ICU

Reliable Implementation is Key



- Are policies and procedures clear and up-to-date?
- Does facility-wide training occur
 - Upon hire?
 - Annually?
 - Are personnel required to demonstrate competency after training?
- Are audits performed in order to estimate compliance?
- Is audit data fed back to frontline employees regularly?
- What is the process for improvement when non-adherence is observed?

Questions to Consider

A Unit Guide To Infection Prevention for Long-Term Care Staff. Bursdall, Schweon, Collier. AHRQ project contract number HHSA290201000025I, task order 8, from the Agency for Healthcare Research and Quality (AHRQ). March 2017

Does your facility have written intake procedures to identify potentially infectious persons at the time of admission?

Does your facility have a system for notification of the person assigned to infection prevention when antibiotic-resistant organisms or *C. difficile* are reported?

Do all departments in your facility

- Receive education about infection control and isolation practices
- Have access to health record screens with infection control flags
- Participate in audit and feedback programs

Does your facility have a written plan for outbreak response which includes

- A definition for “Outbreak?”
- Procedures for surveillance and containment?
- A list of syndromes or pathogens for which monitoring is performed?

Contact Precautions: what's missing?







Infection

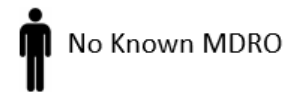


Colonization

The Large Burden of MDROs in Nursing Homes

Facility Type	Documented MDRO	Actual MDRO
Nursing Homes (n = 14)	17% 	58% 
Ventilator-Capable Nursing Homes (n = 4)	20% 	76% 

McKinnell JA et al, Clin Infect Dis. 2019; 69(9):1566-1573



Enhanced Barrier Precautions

- Use of gown and gloves during high-contact resident care activities
- No private room required
- Residents can participate in group activities
- Intended to be used for resident's entire length of stay

STOP **ENHANCED BARRIER PRECAUTIONS** **STOP**
EVERYONE MUST:

 Clean their hands, including before entering and when leaving the room.

PROVIDERS AND STAFF MUST ALSO:

  Wear gloves and a gown for the following High-Contact Resident Care Activities.

Dressing
Bathing/Showering
Transferring
Changing Linens
Providing Hygiene
Changing briefs or assisting with toileting
Device care or use:
central line, urinary catheter, feeding tube,
tracheostomy
Wound Care: any skin opening requiring a dressing

Do not wear the same gown and gloves for the care of more than one person.

 U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Use a gown and gloves during high contact resident care activities



- Examples of high-contact resident care activities requiring gown and glove use for **Enhanced Barrier Precautions** include:
 - Dressing
 - Bathing/showering
 - Transferring
 - Providing hygiene
 - Changing linens
 - Changing briefs or assisting with toileting
 - Device care or use: central line, urinary catheter, feeding tube, tracheostomy/ventilator
 - Wound care: any skin opening requiring a dressing

Summary

- Standard Precautions are always in effect, no matter what type of healthcare setting
- There are many types of transmission-based precautions
- Implementation of transmission-based precautions differs by facility type

Questions?



Contact Kate at ltynr@nebraskamed.com