



# **A Toolkit for Implementing Personal Protective Equipment in Nursing Homes to Prevent the Spread of Multidrug- and Extensively Drug-Resistant Organisms**

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### Introduction

Nursing homes provide care to a population with a high risk of infection because of the higher rates of chronic diseases, increasing severity of illness, impaired mental and functional status, and presence of indwelling devices, such as feeding tubes and urinary catheters.<sup>1</sup> Implementing evidence-based practices in nursing homes can be challenging due to the lack of well-designed studies and the increasing care needs of persons in nursing homes, especially residents in skilled nursing facilities. Challenges include low staffing ratios, high staff turnover rates, and the acuity of the resident population.<sup>2</sup>

When nursing homes admit new residents or identify an existing resident with a newly detected extensively drug-resistant organism (XDRO) or an epidemiologically important multidrug-resistant organism (MDRO), the facility must consider several factors when determining bed placement. The facility census, the acuity of care provided at the skilled nursing facility, regional- and facility-level prevalence of organisms of concern, and bed availability are just a few items considered when accepting a new admission or determining if a resident should be moved to another bed within the same facility. Identifying an XDRO or MDRO further complicates the situation when determining bed placement.

**When referring to a novel or targeted XDRO, the Illinois Department of Public Health (IDPH) is referring to organisms that are being entered into the Illinois XDRO registry:**

- ***Candida auris*, carbapenem-resistant Enterobacterales (CRE), carbapenem-resistant *Acinetobacter baumannii*, and carbapenemase-producing *Pseudomonas aeruginosa*.**

CDC does not use the term XDRO. This is specific to the IL XDRO registry.

**When referring to other epidemiologically important pathogens or MDROs, IDPH is referring to the following organisms:**

- **Methicillin-resistant *Staphylococcus aureus* (MRSA), ESBL-producing Enterobacterales, vancomycin-resistant *Enterococci* (VRE), multidrug-resistant *Pseudomonas aeruginosa*, and drug-resistant *Streptococcus pneumoniae*.**

Congregate care settings encourage socialization and interaction among residents. As a result, control of MDROs, XDROs, and emerging pathogens is particularly challenging in skilled nursing facilities. Providers are aware of the delicate balance between person-centered care and preventing transmission of organisms of concern. In addition to Transmission-Based Precautions, emphasis must be placed on cleaning of the environment which may become contaminated with drug-resistant pathogens and serve as a reservoir for contamination and transmission.

While the Centers for Disease Control and Prevention (CDC) provides guidance for control and containment, it allows state and local public health authorities the flexibility to implement

based on the organisms of local or regional importance. Due to the high burden of XDROs in certain regions in Illinois, IDPH guidance may differ from CDC guidance, and it will be indicated with “(IDPH Recommendation).” Recommendations may be subject to change should the prevalence of XDROs change across the state.

This toolkit aims to provide nursing homes with the necessary tools and resources to implement **Enhanced Barrier Precautions (EBP)** for residents with wounds requiring dressings or indwelling medical devices and successfully admit and care for those residents with an XDRO or epidemiologically important MDRO. This document summarizes best practices and assists with decision making when deciding whether to place a resident on contact precautions or EBP. The toolkit provides directions on how to query the Illinois XDRO registry; examples of interfacility transfer forms; the various Transmission-Based Precautions (TBP) signs from the CDC; algorithms for determining the appropriate TBP category and required personal protective equipment (PPE) for new admissions, any resident with wounds requiring dressings or indwelling medical devices, or when an existing resident is identified by laboratory testing to have an XDRO or targeted MDRO; and cohorting options when room availability is limited. This toolkit includes a PowerPoint presentation ([Appendix M](#)), an in-service attendance sheet ([Appendix L](#)), a post-test ([Appendix N](#)), a key to the post-test ([Appendix O](#)), and a list of references and resources specific to educating health care workers on how to implement appropriate use of personal protective equipment for Transmission-Based Precautions, including the new category of Enhanced Barrier Precautions. The PowerPoint will describe the difference between colonization and active infections; describe Standard, Contact, and EBP; discuss appropriate personal protective equipment use for each type of precaution; and examine whether room restrictions are necessary.

This document is not intended for use in acute care, long-term acute care hospitals (LTACH), or assisted living (AL) communities and does not replace existing guidance regarding use of contact precautions for other pathogens (e.g., *Clostridioides difficile*, norovirus) in nursing homes.

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## Background

Since 2007, nursing homes have applied the Centers for Disease Control and Prevention (CDC) [Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings \(2007\)](#) to prevent the transmission of infectious agents in health care settings. Many of the practices utilized in nursing homes have been adapted from acute care setting practices.<sup>2</sup> While maintaining a home-like environment, nursing homes have struggled with implementing some of these practices, especially Transmission-Based Precautions. Residents with active infections are placed on Contact Precautions, **but colonization is often overlooked and serves as a source of transmission of resistant organisms**. The CDC recognizes that maintaining a balance between preventing transmission of infectious agents and the resident's quality of life has proven to be difficult for nursing homes.<sup>1</sup>

In July 2019, the CDC released the [Implementation of Personal Protective Equipment in Nursing Homes to Prevent Spread of Novel or Targeted Multidrug-resistant Organisms](#).<sup>3</sup> The CDC document introduced a new approach to Transmission-Based Precautions in skilled and intermediate Centers for Medicare and Medicaid Services (CMS)-certified nursing homes called **Enhanced Barrier Precautions**, which recommends gown and glove use for certain residents during specific high-contact resident care activities associated with MDRO transmission.<sup>3,4</sup> At that time, novel or targeted MDROs were defined as pan-resistant organisms, carbapenemase-producing *Enterobacteriaceae*, carbapenemase-producing *Pseudomonas* species, carbapenemase-producing *Acinetobacter baumannii*, and *Candida auris* (*C. auris*). For the purposes of this document, novel or targeted MDROs will be referred to as extensively drug-resistant organisms or XDROs.

In June 2021, the CDC Healthcare Infection Control Practices Advisory Committee (HICPAC) voted to broaden the use of EBP beyond targeted MDROs, to include pathogens that affect every nursing home in the United States, such as *Staphylococcus aureus* (both methicillin-sensitive and resistant).<sup>4</sup>

The consideration to expand EBP as a routine approach to infection control is based on the recognition that Standard Precautions, which require the use of gown and glove in situations of expected exposure to blood, body fluids, skin breakdown, or mucous membranes, often have not been successfully implemented in nursing home settings. Furthermore, Contact Precautions are not widely adopted by nursing homes because they are considered stigmatizing to residents in part due to required resident room restriction, and thus Contact Precautions are typically reserved for residents with short-term pathogen-specific infections rather than long-term pathogen colonization. Lastly, nursing homes are unable to routinely identify residents in the facility colonized with MDROs or are unaware of colonization status or endemic rates of MDROs within their facilities, hampering approaches to gown and glove use that only target residents with known MDRO colonization.<sup>4</sup>

**In July 2022, the CDC updated the [Implementation of Personal Protective Equipment in Nursing Homes to Prevent Spread of Novel or Targeted Multidrug-resistant Organisms](#) guidance to include the expanded use of EBP for all residents in nursing homes with wounds requiring dressings and indwelling medical devices.**

The CDC guidance is considered part of the overall containment strategy to prevent the spread of antibiotic-resistant organisms.<sup>5</sup> The initial containment response aims to identify affected patients, ensure appropriate control measures are promptly implemented to contain further spread, determine if transmission is occurring, and characterize the organism or mechanism to guide further response actions. All health care settings play a role in these containment efforts. Providing timely lab results and

recommendations to affected health care facilities and providers is crucial. The transferring facility should alert the receiving facility if the patient came from or was transferred to another facility.<sup>5</sup> This toolkit is not intended to cover all aspects of the CDC containment strategy but will focus on ensuring appropriate control measures are implemented for Enhanced Barrier and Contact Precautions to reduce further spread.

## Surveillance and Inter-Facility Communication

Nursing homes are required by CMS to:

- Develop an infection control plan capable of providing adequate surveillance and identification of resident diagnoses of infections or MDRO colonization.
- Have a system in place for early detection and management of potentially infectious symptomatic residents at the time of admission, including implementation of precautions as appropriate.
- Communicate infection or MDRO colonization status of residents at the time of transfer into and out of a facility so proper measures can be implemented.<sup>6</sup>

Surveillance is an essential tool for case-finding of single patients or clusters of patients who are infected or colonized with epidemiologically important organisms. Unfortunately, without routine testing, germs with unusual resistance patterns, some of which are resistant to all or most antibiotics tested, are continually developing and spreading.<sup>3</sup> ***Nursing homes must identify and track XDROs or epidemiological important MDROs to reduce further transmission of these pathogens. Maintaining a list of all residents with active infections or colonization is ideal and helpful to nursing homes when determining room placement.***

To assist with the early identification of residents with possible colonization or infection of XDROs, Illinois nursing homes can access the XDRO registry ([www.xdro.org](http://www.xdro.org)). This toolkit includes directions on accessing and utilizing the XDRO registry ([Appendix B](#)). **Nursing homes should query the registry when accepting a new admission.** If the resident has previously been reported to have an XDRO, they will be listed within the registry. Nursing homes can then implement appropriate PPE and isolation precautions at the time of admission.

Querying the XDRO Registry for new admissions is extremely important!

To further prevent the spread of resistant organisms, an interfacility transfer sheet, sometimes called the discharge/transfer sheet, should be used when residents are transferred from one facility to another. This tool is vital to communicate a resident's colonization or infection status to the receiving facility so appropriate measures can be implemented. Some nursing homes may be able to electronically generate the discharge/transfer sheet while others will need to complete a paper copy and send with the resident. A copy of two examples of the interfacility transfer sheet is included within this toolkit ([Appendix C](#)).

Use and request that other facilities to use an Interfacility Transfer Sheet.

## Standard and Transmission-Based Precautions

Determining the appropriate precautions and personal protective equipment (PPE) can sometimes be challenging. This toolkit includes two algorithms, which help guide practice decisions for new admissions or readmissions ([Appendix D](#)) and newly identified XDROs or MDROs ([Appendix E](#)). The algorithms

require nursing homes to consider certain resident risk factors affecting room placement and the kind of Transmission-Based Precautions necessary to reduce the transmission of these infectious pathogens. Also provided in the toolkit are various cohorting options when using multioccupancy rooms ([Appendix E](#)). A description of each Transmission-Based Precaution category and best practices are listed below.

### *Standard Precautions*

**Description:** A group of infection prevention practices that **apply to the care of all residents**, regardless of suspected or confirmed infection or colonization status.

- Proper selection and use of PPE (e.g., gown, gloves, face protection)
  - PPE use is based upon staff interaction with residents and the potential for exposure to blood, body fluids, mucous membranes, non-intact skin, and potentially contaminated environmental surfaces or equipment.
- Hand hygiene
- Safe injection practices
- Respiratory hygiene and cough etiquette
- Environmental cleaning and disinfection
- Reprocessing of reusable medical equipment
- Residents are not restricted to their room and are allowed to participate in communal dining and group activities.

### *Transmission-Based Precautions*

Transmission-Based Precautions (TBPs) are for residents known or suspected to be infected or colonized with infectious agents, including XDROs and MDROs that require additional control measures to effectively prevent transmission. TBPs include airborne, droplet, contact, and enhanced barrier precautions. TBPs are intended to prevent transmission of infectious agents, including epidemiologically important microorganisms, which are spread by direct or indirect contact with the patient or the patient's environment.

#### *Determining the Type of Transmission-Based Precautions*

**At a minimum, residents colonized or infected with an XDRO will require EBP. A facility will need to use a risk-based approach to determine the type of TBP to use for XDROs and whether TBP is even warranted for a resident with an MDRO (e.g., consider the resident's clinical situation, and the prevalence or incidence of MDROs in the facility).**

XDROs  
require EBP!

When implementing TBP among residents in long-term care facilities, consider both of the following facility-level approaches to determine if TBP are warranted for a resident, keeping in mind that standard precautions should be used on all residents during all care.

#### **1. Pathogen-based**

- a) XDROs: EBP should be used for residents with an XDRO unless the resident has draining wounds that cannot be contained (e.g., residents who cannot maintain adequate hygiene) and/or diarrhea, in which case contact precautions would be indicated.
- b) MDROs: A facility should use a risk-based approach to determine what type of precautions (contact or EBP), if any, are warranted for a resident colonized or infected with MDROs. A

risk-based approach takes into consideration the resident's clinical situation, and the prevalence or incidence of MDROs in the facility. Consider this approach for residents with organisms not previously encountered in the facility.

## 2. Risk-based

- a) Use EBP for residents with wounds requiring dressings (e.g., pressure ulcers, diabetic foot ulcers, unhealed surgical wounds, and chronic venous stasis ulcers) UNLESS the drainage from the wound cannot be contained (e.g., residents who cannot maintain adequate hygiene), or the resident is colonized or infected with an infection or condition listed in CDC's Guideline for Isolation Precautions Appendix A where contact precautions are recommended.
- b) Use EBP for residents with any indwelling devices (e.g., central lines, urinary catheters, feeding tubes, hemodialysis catheters, tracheostomies, and ventilators) UNLESS the resident is colonized or infected with an infection or condition listed in CDC's [Appendix A](#) where contact precautions are recommended.

Consider both approaches #1 and #2.

### Best Practices

- Post signage on the door or outside of resident rooms indicating the type of precautions required. If the facility is not using the CDC Transmission-Based Precautions signage<sup>9</sup>, the facility sign must indicate the type of Transmission-Based Precautions, the PPE required for entry to room, and for EBP include the type of activities requiring PPE to be worn.
- Ensure PPE is available immediately outside the resident room. PPE includes a gown and gloves. Face protection may be needed if performing an activity with a risk of splash or spray.
- Ensure alcohol-based hand rub (ABHR) is available. Ideally, ABHR should be available inside and outside each resident room.<sup>8</sup>
- Position a trash can or linen hamper for launderable gowns inside the resident's room near the exit for discarding PPE before exiting the room or providing care to another resident in the same room.
- Provide education to residents and visitors.

### Enhanced Barrier Precautions



([Appendix G](#))



**Description:** Expands the use of PPE beyond situations in which exposure to blood and body fluids is anticipated<sup>7</sup> and, in July 2022, the CDC further expanded EBP to include all residents in nursing homes with wounds requiring dressings and indwelling medical devices.

- Single or private rooms are not required.
- **Wear a gown and gloves during high-contact resident care activities that provide opportunities for transfer of organisms to staff hands and clothing. XDROs and/or MDROs may be indirectly transferred from resident-to-resident during these high-contact care activities:**
  - 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 requiring a dressing
  - Cleaning and disinfection of room
- Gown and gloves are not required for resident care activities other than those listed above unless required for Standard Precautions.
- Residents are not restricted to their rooms.
- Residents are allowed to participate in communal dining and group activities.
- Disposable or dedicated medical equipment is not required, but any reusable medical equipment should be cleaned and disinfected with an appropriate agent between residents.
- Because EBP do not impose the same activity and room placement restrictions as contact precautions, ***they are intended to be in place for the duration of a resident's stay in the facility or until resolution of the wound or discontinuation of the indwelling medical device that placed them at higher risk.***

**Enhanced Barrier Precautions (EBP) apply to residents with any of the following:**

- At a minimum, residents infected or colonized with a novel or targeted XDRO when contact precautions do not apply. EBP can also include other epidemiologically important MDROs such as methicillin-resistant *Staphylococcus aureus* (MRSA) or extended spectrum beta-lactamase producing organisms (ESBLs). Facilities should use a risk-based approach to determine if EBP is warranted for MDROs.
- EBP do not replace existing guidance regarding the use of contact precautions for other pathogens (e.g., *Clostridioides difficile*, norovirus) in nursing homes.
- All residents with wounds that require dressings and/or indwelling medical devices (e.g., central line, urinary catheter, feeding tube, tracheostomy/ventilator) regardless of MDRO colonization status.

## Contact Precautions



([Appendix H](#))

**Description:** One type of Transmission-Based Precautions used when pathogen transmission is not completely interrupted by Standard Precautions alone. Contact Precautions are intended to prevent the transmission of infectious agents, like XDROs and MDROs, that are spread by direct or indirect contact with the resident or the resident's environment.<sup>2</sup>

The addition of EBP will require review of existing policies, procedures, and training materials relating to Contact Precautions, as room restriction and use of Contact Precautions may be modified.

- A single-patient room is preferred for patients who require Contact Precautions. When a single-patient room is not available, consultation with infection control personnel is recommended to assess the various risks associated with other patient placement options (e.g., cohorting, keeping the patient or resident with an existing roommate). Single rooms should be further prioritized for residents with *Clostridioides difficile* (*C. difficile*).
- Wear a gown and gloves for all interactions with the patient or potentially contaminated areas in the patient's or resident's environment. Don PPE upon room entry and discard before exiting the patient room.
- Use disposable noncritical patient-care equipment (e.g., blood pressure cuffs) or implement patient-dedicated use of such equipment. If common use of equipment for multiple patients is unavoidable, clean and disinfect such equipment before use on another patient or resident.
- Residents are restricted to their rooms except for medically necessary care and are not allowed to participate in communal dining and group activities.
- **Contact Precautions are generally intended to be time limited and, when implemented, should include a plan for discontinuation or de-escalation. Facility prevalence of the organism(s) and containment success should be included in decision making about de-escalation.**

**Contact Precautions are required for all residents infected or colonized with an XDRO in any of the following situations:**

- Residents with draining wounds that cannot be contained (e.g., who cannot maintain adequate hygiene) and/or diarrhea, regardless of MDRO status.
- Residents with *C. difficile* infection.
- Residents who have another infection (e.g., norovirus, scabies) or condition for which Contact Precautions are recommended in CDC's [Appendix A](#).
- On units or in nursing homes where ongoing transmission is documented or suspected.

Basic information on Droplet and Airborne Precautions is provided below; however, nursing homes should follow the CDC's [Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007](#) when implementing Droplet and Airborne Precautions.

#### Droplet Precautions



([Appendix I](#))

**Description:** Droplet Precautions are intended to prevent transmission of pathogens spreading through close respiratory or mucous membrane contact with respiratory secretions.

- **Limit transport or movement of a resident outside of the room.** If transport or movement outside the room is necessary, instruct the patient to wear a mask and follow Respiratory Hygiene/Cough Etiquette.
- **Droplet Precautions may be combined with Contact Precautions for respiratory infections,** particularly bronchiolitis and pneumonia, in infants and young children (e.g., respiratory syncytial virus (RSV), parainfluenza virus, adenovirus, influenza virus, human metapneumovirus). Follow CDC recommendations.
- **Droplet Precautions should be combined with Contact Precautions** and the use of an N95 respirator (or higher) when providing care for persons with suspected or confirmed COVID-19 or Mpox (monkeypox). Follow CDC recommendations.

## Airborne Precautions



(Appendix J)

**Description:** Airborne Precautions prevent transmission of infectious agents that remain infectious over long distances when suspended in the air (e.g., measles virus [measles], varicella zoster virus [chickenpox, disseminated shingles]), *M. tuberculosis*, and possibly SARS-CoV.<sup>2</sup>

- **The resident should be masked with a surgical or procedure mask when outside the airborne infection isolation room.**
- **Nursing homes are not generally equipped to meet and provide Airborne Precautions standards.**
- **Place a surgical or procedure mask on the resident and set up the transfer if an airborne infection isolation room cannot be provided. Notify the emergency medical services transport company that the resident is on Airborne Precautions.**

**Best Practices:**

- Private room with the door closed.
- The preferred placement for patients who require Airborne Precautions is in an airborne infection isolation room (AIIR). An AIIR is a single-patient room with special air handling and ventilation capacity that meet the American Institute of Architects/Facility Guidelines Institute (AIA/FGI) standards.<sup>2</sup>
- Respiratory protection is required. Wear an N95 (fit tested) respirator or a powered air purifying respirator (PAPR).
- Post signage on the door or outside the resident room indicating Airborne Precautions are required.<sup>11</sup>

**There will be situations when the health of the resident changes that require an adjustment in the type of Transmission-Based Precautions. Nursing homes need to understand residents will transition between Transmission-Based Precaution types (e.g., EBP to Contact Precautions or Contact Precautions to EBP). The type of personal protective equipment worn depends on the Transmission-Based Precautions required.**

**It is critical for nursing homes to communicate newly identified XDROs and MDROs or ongoing transmission issues within the facility to local health departments (LHDs). Nursing homes may consider contacting the LHD for assistance in determining the appropriate type of Transmission-Based Precaution to implement and whether moving from one kind of precaution to a different type is warranted. [Appendix R](#) includes questions nursing homes should consider when implementing Enhanced Barrier or Contact Precautions.**

## Room Placement and Cohorting Options for Multioccupancy Rooms

To help you decide who can room together!

**NOTE:** Ensure that each bed space is treated as a different room; gown and gloves must be changed between residents in the same room and hand hygiene must be performed between each resident. When cleaning and disinfecting the room with an appropriate agent, each care space must be considered a different room and cleaning/disinfecting cloths must be new.

1. Facilities should cohort/place residents **without evidence of MDRO or XDRO colonization/infection** (both are negative on screening or never screened) **together when possible**. Ideally, cohort two residents who were negative on screening together before placing someone who is negative with an individual with unknown XDRO/MDRO status (i.e., someone who has never been tested or screened).
2. Do not cohort someone without evidence of an XDRO colonization/infection (never screened) with someone: **(IDPH recommendation)**
  - a. Positive for XDRO colonization or infection
  - b. Immunocompromised
  - c. With indwelling medical devices
  - d. With wound requiring dressings
3. Residents with indwelling devices and contained drainage can be roomed with others unless the other individual has an XDRO.
4. May cohort residents together who have similar epidemiologically important MDROs (e.g., MRSA, ESBL-producing Enterobacterales, VRE, multidrug-resistant *P. aeruginosa*, and drug-resistant *S. pneumoniae*)—even if one of the roommates has an indwelling medical device or a wound requiring a dressing if the drainage can be contained.
5. Cohorting options for residents who are colonized or infected with XDROs are listed in order of preference.
  - a. Single or private room (when feasible)
  - b. May cohort residents with similar novel or targeted XDROs and similar resistance mechanisms (see 5c below); **EXCEPT DO NOT cohort residents colonized or infected with *C. auris* only and no other organisms in multi-occupancy rooms with other types of organisms**. Residents with *C. auris* only and no other organisms should be placed in a single or private room or be cohorted together with other residents colonized or infected with *C. auris* only and no other organisms. **(IDPH recommendation)**
    - i. Residents with co-infections involving any endemic carbapenemase-producing organisms (CPOs) and *C. auris* can be cohorted with other residents with endemic CPO and *C. auris* co-infections.
    - ii. Residents with co-infections involving any rare CPOs and *C. auris* can be cohorted with other residents with rare CPO and *C. auris* co-infections.
  - c. Cohort residents with CPOs as follows:
    - i. Residents with CPOs with endemic mechanism(s) (e.g., CRE-KPC, CRAB OXA-23, or CRAB OXA-24/40) or unknown mechanism(s) can be cohorted/placed together.
    - ii. Residents with CPOs with rare or low prevalence mechanism(s) (e.g., non-KPC CRE, such as NDM, VIM) should only be cohorted with other residents with identical organism-mechanism combination(s).

6. Cohorting decisions should consider how movement of residents may impact the spread of organisms. Changing room placement can be challenging, especially in ventilator-equipped skilled nursing facilities (vSNFs) and facilities where the census is high and there are no empty or buffer rooms to accommodate the movement and thorough cleaning and disinfection of the previously occupied room and/or bed space. In facilities with a high prevalence of XDROs, the risks associated with movement may outweigh the benefits. Decisions should be made in the context of the overall risk of exposure.
  - a. Before making changes involving complex cohorting decisions, facilities should contact their LHD. The LHD can assist in determining appropriate cohorting options based upon facility prevalence, types of XDROs in the facility, and bed availability.

## Education and Training of Staff

Before implementing EBP, nursing homes must incorporate EBP into facility policies and provide education and training to all health care staff. Staff must understand EBP and the required PPE to wear during high-contact resident care activities. Staff will also need education and training on the changes in implementing Contact Precautions. Education and training should be provided at the time of hire, annually (or possibly every six months in high-burden nursing homes), and when gaps in practice are identified.

This toolkit includes a PowerPoint presentation ([Appendix M](#)), an in-service attendance sheet ([Appendix L](#)), a post-test ([Appendix N](#)), a key to the post-test ([Appendix O](#)), and a list of references and resources specific to educating health care workers on how to implement appropriate use of personal protective equipment for Transmission-Based Precautions including the new category of EBP. The PowerPoint will describe the difference between colonization and active infections; describe Standard, Contact, and EBP; discuss appropriate personal protective equipment use for each type of precaution; and examine whether room restrictions are necessary.

Initial staff training should include reviewing the PowerPoint presentation and completing a post-service test to validate comprehension of the education material. Competency ([Appendix Q](#))<sup>12</sup> can be measured by having staff perform a return demonstration of donning and doffing of PPE for each type of isolation precaution ([Appendix P](#)).<sup>13</sup>

## Cleaning and Disinfection

Environmental contamination has been associated with the transmission of pathogens in significant outbreaks. Meticulous cleaning and disinfection of resident rooms and mobile equipment are necessary to reduce the risk of transmission.<sup>14</sup>

Although this toolkit is not focusing specifically on cleaning and disinfection, nursing homes must ensure the products being used are U.S. Environmental Protection Agency (EPA)-registered products for use in health care that are effective against circulating pathogens. Not all products are capable of killing all pathogens. When selecting the optimal disinfectant, nursing homes should consider using the document "Selection of the Ideal Disinfectant" by Dr. Rutala and Dr. Weber ([Appendix K](#)).<sup>14</sup> CDC has a prevention toolkit designed explicitly for evaluating environmental cleaning and disinfection.<sup>15</sup> Nursing homes can reference the EPA website for a list of EPA-registered products effective against common and novel pathogens.<sup>16</sup>

Additional Resources Available through the CDC

**Frequently Asked Questions (FAQs) about Enhanced Barrier Precautions in Nursing Homes (July 2022).**

<https://www.cdc.gov/hai/containment/faqs.html>

**PowerPoint Implementation of Enhanced Barrier Precautions in Nursing Homes.** Presentation

<https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.cdc.gov%2Fhai%2Fpdfs%2Fcontainment%2FEBP-Presentation-July2022.pptx&wdOrigin=BROWSELINK>

**Enhanced Barrier Precautions Letter Nursing Homes Residents, Families, Friends, and Volunteers.**

<https://www.cdc.gov/hai/pdfs/containment/Letter-Nursing-Home-Residents-Families-Friends-508.pdf>

## References

<sup>1</sup>Mody L, Bradley S, Galecki A, et al. Conceptual Model for Reducing Infectious and Antimicrobial resistance in Skilled Nursing Facilities: Focusing on Residents with Indwelling Devices. *Aging and Infectious Disease* 2011; 52: 654-661.

<sup>2</sup>Centers for Disease Control and Prevention. Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007). <https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html>. Accessed January 15, 2020.

<sup>3</sup>Centers for Disease Control and Prevention. Implementation of Personal Protective Equipment in Nursing Homes to Prevent spread of Novel or Targeted Multidrug-resistant Organisms (MDROs). <https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html>. Accessed January 15, 2020.

<sup>4</sup>Centers for Disease Control and Prevention. Consideration for Use of Enhanced Barrier Precautions in Skilled Nursing Facilities, June 2021. <https://www.cdc.gov/hicpac/pdf/EnhancedBarrierPrecautions-H.pdf>. Accessed July 12, 2022.

<sup>5</sup>Centers for Disease Control and Prevention. Interim Guidance for a Public Health Response to Contain Novel or Targeted Multidrug-resistant Organisms (MDROs). <https://www.cdc.gov/hai/pdfs/containment/Health-Response-Contain-MDRO-H.pdf>. Accessed August 4, 2022.

<sup>6</sup>National Academies of Sciences, Engineering, and Medicine. (2022). The National Imperative to Improve Nursing Home Quality: Honoring Our Commitment to Residents, Families, and Staff. <https://www.cms.gov/medicareprovider-enrollment-and-certificationsurvey/certificationgeninfo/policy-and-memos-states-and/revised-long-term-care-surveyor-guidance-revisions-surveyor-guidance-phases-2-3-arbitration>. Accessed August 10, 2022.

<sup>7</sup>Centers for Disease Control and Prevention. Implementation of Personal Protective Equipment in Nursing Homes to Prevent spread of Novel or Targeted Multidrug-resistant Organisms (MDROs). <https://www.cdc.gov/hai/pdfs/containment/enhanced-barrier-precautions-sign-P.pdf>. Accessed August 4, 2022.

<sup>8</sup>Illinois Department of Public Health. Memorandum. Use of Alcohol-Based Hand Rubs for Hand Hygiene in Long-Term Care Facilities. February 5, 2019.

<https://dph.illinois.gov/content/dam/soi/en/web/idph/files/alcohol-based-hand-rub-ltc-faq.pdf>.

Accessed August 4, 2022.

<sup>9</sup>Centers for Disease Control and Prevention. Transmission-Based Precautions. Contact Isolation sign. English <https://www.cdc.gov/infectioncontrol/pdf/contact-precautions-sign-P.pdf>.

Spanish <https://www.cdc.gov/infectioncontrol/pdf/spanish-contact-precautions-sign-P.pdf>. Accessed August 4, 2022.

<sup>10</sup>Centers for Disease Control and Prevention. Transmission-Based Precautions. Droplet Isolation sign. English <https://www.cdc.gov/infectioncontrol/pdf/droplet-precautions-sign-P.pdf>.

Spanish <https://www.cdc.gov/infectioncontrol/pdf/spanish-droplet-precautions-sign-P.pdf>. Accessed August 4, 2022.

<sup>11</sup>Centers for Disease Control and Prevention. Transmission-Based Precautions. Airborne Isolation sign. English <https://www.cdc.gov/infectioncontrol/pdf/airborne-precautions-sign-P.pdf>.

Spanish <https://www.cdc.gov/infectioncontrol/pdf/spanish-airborne-precautions-sign-P.pdf>. Accessed August 4, 2022.

<sup>12</sup> Association for Professionals in Infection Control and Epidemiology (APIC) Forms and Checklists for Infection Prevention., Volume 1. 2017. Personal Protective Equipment (PPE) Competency.

<sup>13</sup>Centers for Disease Control and Prevention. Example of Safe Donning and Removal of Personal Protective Equipment (PPE). <https://www.cdc.gov/hai/pdfs/ppe/PPE-Sequence.pdf>. Accessed August 4, 2022.

<sup>14</sup>Rutala, W., & Weber, D. (2014). Selection of the Ideal Disinfectant. *Infection Control & Hospital Epidemiology*, 35(7), 855-865.

<sup>15</sup>Centers for Disease Control and Prevention. Options for Evaluating Environmental Cleaning. <https://www.cdc.gov/hai/toolkits/evaluating-environmental-cleaning.html>. Accessed August 4, 2022.

<sup>16</sup>United States Environmental Protection Agency. Pesticide Registration. Selected EPA-Registered Disinfectants. <https://www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants>. Accessed August 4, 2020.



## Appendices

### Appendix A: List of Definitions and Acronyms

**MDROs:** Multidrug-resistant organisms. For the purposes of this document, MDRO refers to organisms such as methicillin-resistant *Staphylococcus aureus* (MRSA), ESBL-producing Enterobacterales, vancomycin-resistant Enterococci (VRE), multidrug-resistant *Pseudomonas aeruginosa*, and drug-resistant *Streptococcus pneumoniae*.

**XDROs:** Extensively drug-resistant organisms. For the purposes of this document, XDRO refers to organisms entered into the XDRO registry: *Candida auris*, carbapenem-resistant Enterobacterales, carbapenem-resistant *Acinetobacter baumannii*, and carbapenemase-producing *Pseudomonas aeruginosa*.

**CPOs:** Carbapenemase-producing organisms. Organisms that produce enzymes that breakdown carbapenems (antibiotics). They carry resistance genes on mobile genetic elements, called plasmids, that can be easily spread. Pathogens included in this category are CP-CRAB, CP-CRE, and CP-CRPA.

**CRAB:** Carbapenem-resistant *Acinetobacter baumannii*.

**CP-CRAB:** Carbapenem-resistant *Acinetobacter baumannii* identified to produce a carbapenemase or have a specific gene mechanism that makes it resistant to carbapenems. In Illinois, OXA-24/40 has been most identified with CP-CRAB. Other carbapenemases associated with CRAB are OXA-23 and OXA-58.

**CRE:** Carbapenem-resistant Enterobacterales. Enterobacterales is an order of bacteria that includes organisms such as *E. coli*, *Enterobacter* species, *Klebsiella* species.

**CP-CRE:** Carbapenem-resistant Enterobacterales identified to produce a carbapenemase or have a specific gene mechanism that makes it resistant to carbapenems. In Illinois, *Klebsiella pneumoniae* carbapenemase (KPC) has been most identified with CP-CRE. Other carbapenemases associated with CRE are:

- New Delhi metallo-beta-lactamase (NDM)
- Verona integron-encoded metallo-beta-lactamase (VIM)
- Imipenemase (IMP)
- Oxacillinase-48 (OXA-48)

**CP-CRPA:** Carbapenem-resistant *Pseudomonas aeruginosa* identified to produce a carbapenemase or have a specific gene mechanism that makes it resistant to carbapenems. In Illinois, VIM has been most commonly identified with CP-CRPA.

**EBP:** Enhanced barrier precaution

**LHD:** Local health department

**PPE:** Personal protective equipment

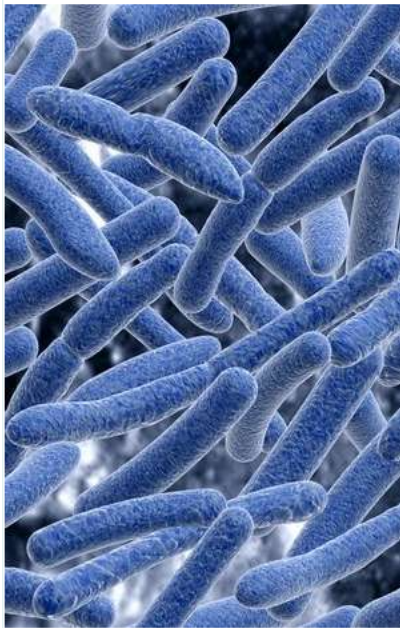
## Appendix B: Directions on Accessing the XDRO Registry

<https://www.xdro.org/index.html>

**XDRO**  
registry

Extensively drug resistant organism registry

Citations Help Login



The XDRO registry is a product of collaboration between IDPH, Medical Research Analytics and Informatics Alliance (MRAIA), and the Chicago CDC Prevention Epicenter.

**To report CRE, please log-in through IDPH portal and access the XDRO registry under 'product application'**

**For log-in issues, including password resets, refer to the IDPH web portal [home page](#)**

**New users (who do not have access to the IDPH web portal):** You must register for access to the IDPH web portal. Fill out the form to create a new username, and select the box to access the application "INEDSS (Disease Surveillance) System/XDRO registry (extensively drug resistant organism)." This may take several weeks to process.

**Users who have access to the IDPH web portal, but not the INEDSS/XDRO application:** If you already have a username and access to the IDPH web portal, **do not fill out a new registration form.** Please have your facility Portal Registration Authority (PRA)\* send an email to [DPH.Security@illinois.gov](mailto:DPH.Security@illinois.gov) requesting for you to have access to the additional application "INEDSS (Disease Surveillance) System/XDRO registry (extensively drug resistant organism)." Make sure your PRA includes your full name and User ID.

**Existing INEDSS users:** Your existing IDPH log-in will automatically give you access to the XDRO registry.

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\* Each facility needs a Portal Registration Authority (PRA). The PRA is a designated employee at the facility who is authorized to approve access to IDPH applications for other staff at the facility. If your facility does not have a PRA, a quick video and instructions on how to set up a PRA are available on the [training page](#).

<https://www.xdro.org/training-videos.html>

**XDRO**  
registry

Extensively drug resistant organism registry

Help Login



The XDRO registry is a product of collaboration between IDPH, Medical Research Analytics and Informatics Alliance (MRAIA), and the Chicago CDC Prevention Epicenter.

## XDRO Training Quick Videos

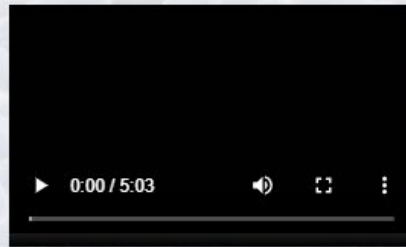
### Background

The series of quick videos below is designed to show users how to register for and use the XDRO registry. For more information, refer to the [FAQ page](#), your local health department, or the IDPH XDRO team at [dph.xdroregistry@illinois.gov](mailto:dph.xdroregistry@illinois.gov).

### Videos

**Title:** Registering for the XDRO registry

**Video:** [Registering for the XDRO registry.mp4](#)



**Slides:** [\[Registering for XDRO\\_final.pdf\]](#)

**Title:** Setting up a Portal Registration Authority (PRA)

**Video:** [Becoming a PRA.mp4](#)



**Slides:** [\[Becoming a PRA\\_final.pdf\]](#)

**PRA instructions and agreement (PDF):** [\[5.22.17\\_OPPTS\\_Becoming a PRA and agreement.pdf\]](#)

**Title:** Reporting requirements to the XDRO registry

**Video:** [Reporting Requirements\\_Final.mp4](#)





## The Extensively Drug-Resistant Organism (XDRO) Registry

The Illinois Department of Public Health (IDPH) and Chicago CDC Prevention Epicenter developed an infection control tool called the XDRO registry to improve:

1. **Inter-facility communication:** The registry provides efficient information exchange across the spectrum of healthcare about patients who have tested positive for carbapenem-resistant Enterobacteriales (CRE) and other emerging pathogens of concern (e.g., *Candida auris*).
2. **XDRO surveillance:** The registry stores XDRO surveillance data that can be used to measure XDRO burden and to detect clusters.

### Reporting Requirements

- The Control of Communicable Diseases Code (77 Ill. Adm. Code 690) requires hospitals, laboratories, and long-term care facilities to report CRE that meet surveillance criteria.
- As of November 2013, the **first CRE-positive culture per patient stay** must be reported to the XDRO registry **within 7 calendar days** after the test result is finalized.

#### *CRE surveillance criteria*

Enterobacteriales (e.g., *E. coli*, *Klebsiella* spp, *Enterobacter* spp, *Proteus* spp, *Citrobacter* spp, *Serratia* spp, *Morganella* spp, or *Providentia* spp) with one of the following laboratory test results:

1. Molecular test (e.g., polymerase chain reaction [PCR]) specific for carbapenemase;
2. Phenotypic test (e.g., modified Carbapenem Inactivation Method [mCIM]) specific for carbapenemase production; or
3. Susceptibility test (**for *E. coli* and *Klebsiella* spp only, excluding *K. aerogenes***): non-susceptible (intermediate or resistant) to ONE of the following carbapenems (doripenem, meropenem, or imipenem) AND resistant to ALL of the following third generation cephalosporins tested (ceftriaxone, cefotaxime, and ceftazidime). Note: ignore ertapenem for this definition.

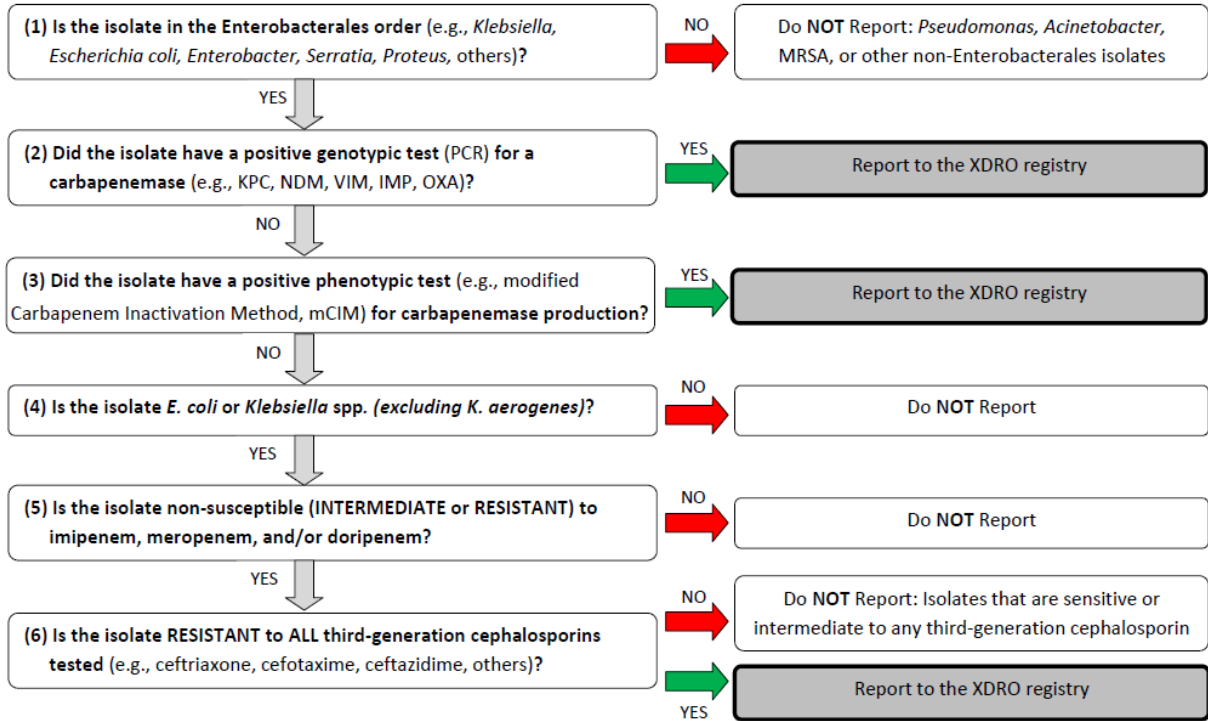
### Highlighted Feature – Automated Alerts

- The registry has a system, called auto alerts, for rapid notification of XDRO carriage at the time of patient admission to support appropriate infection control action.
- A hospital sends its inpatient admission feeds to automatically search the registry for XDRO-positive patients. If a match is found, an alert is sent to the hospital's infection preventionist (IP), who can then review patient-specific information in the registry.



**XDRO registry website:** [www.xdro.org](http://www.xdro.org) • **Contact:** [DPH.XDROregistry@illinois.gov](mailto:DPH.XDROregistry@illinois.gov)

## Report Carbapenem-Resistant Enterobacterales (CRE) isolates to the XDRO registry



XDRO registry website: [www.xdro.org](http://www.xdro.org) • XDRO registry e-mail: [DPH.XDROregistry@illinois.gov](mailto:DPH.XDROregistry@illinois.gov)

Revised 02/2023



Available at: [https://www.xdro.org/img/XDRO\\_Reporting\\_Requirements\\_and\\_lowchart\\_2.2023.pdf](https://www.xdro.org/img/XDRO_Reporting_Requirements_and_lowchart_2.2023.pdf)

## Appendix C: Interfacility Transfer Forms

**Example 1: [Interfacility Transfer Form from Centers for Disease Control and Prevention \(CDC\)](https://www.cdc.gov/hai/pdfs/toolkits/Interfacility-IC-Transfer-Form-508.pdf)**

<https://www.cdc.gov/hai/pdfs/toolkits/Interfacility-IC-Transfer-Form-508.pdf>

**Inter-facility Infection Control Transfer Form**

This form must be filled out for transfer to accepting facility with information communicated prior to or with transfer.

Please attach copies of latest culture reports with susceptibilities if available.

**Sending Healthcare Facility:**

Patient/Resident Last Name	First Name	Date of Birth	Medical Record Number

Name/Address of Sending Facility	Sending Unit	Sending Facility Phone

Sending Facility Contacts	Contact Name	Phone	E-mail
Transferring RN/Unit			
Transferring physician			
Case Manager/Admin/SW			
Infection Preventionist			

Does the person* currently have an infection, colonization OR a history of positive culture of a multidrug-resistant organism (MDRO) or other potentially transmissible infectious organism?	Colonization or history (Check if YES)	Active infection on Treatment (Check if YES)
Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Vancomycin-resistant <i>Enterococcus</i> (VRE)	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<i>Clostridioides difficile</i>	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<i>Acinetobacter</i> , multidrug-resistant	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Enterobacteriaceae (e.g., <i>E. coli</i> , <i>Klebsiella</i> , <i>Proteus</i> ) producing-Extended Spectrum Beta-Lactamase (ESBL)	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Carbapenem-resistant Enterobacteriaceae (CRE)	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<i>Pseudomonas aeruginosa</i> , multidrug-resistant	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
<i>Candida auris</i>	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Other, specify (e.g., lice, scabies, norovirus, influenza):	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes

**Does the person\* currently have any of the following? (Check here  if none apply)**

- |  |  |
|--|--|
| <input type="checkbox"/> Cough or requires suctioning                    | <input type="checkbox"/> Central line/PICC (Approx. date inserted <input type="text"/> ) |
| <input type="checkbox"/> Diarrhea  | <input type="checkbox"/> Hemodialysis catheter   |
| <input type="checkbox"/> Vomiting  | <input type="checkbox"/> Urinary catheter (Approx. date inserted <input type="text"/> )  |
| <input type="checkbox"/> Incontinent of urine or stool                   | <input type="checkbox"/> Suprapubic catheter   |
| <input type="checkbox"/> Open wounds or wounds requiring dressing change | <input type="checkbox"/> Percutaneous gastrostomy tube                                   |
| <input type="checkbox"/> Drainage (source): <input type="text"/>         | <input type="checkbox"/> Tracheostomy  |

Page 2 of CDC Inter-facility Infection Control Transfer Form

**Inter-facility Infection Control Transfer Form**

Is the person\* currently in Transmission-Based Precautions?  NO  YES

Type of Precautions (check all that apply)  Contact  Droplet  Airborne  Enhanced Barrier Precautions

Other: \_\_\_\_\_

Reason for Precautions: \_\_\_\_\_

Is the person\* currently on antibiotics?  NO  YES (current use)

Antibiotic, dose, route, freq.	Treatment for:	Start date	Anticipated stop date	Date/time last dose

Vaccine	Date administered (If known)	Lot and Brand (If known)	Year administered (If exact date not known)	Does the person* self-report receiving vaccine?
Influenza (seasonal)				<input type="checkbox"/> Yes <input type="checkbox"/> No
Pneumococcal (PPSV23)				<input type="checkbox"/> Yes <input type="checkbox"/> No
Pneumococcal (PCV13)				<input type="checkbox"/> Yes <input type="checkbox"/> No
Other: _____				<input type="checkbox"/> Yes <input type="checkbox"/> No

\*Refers to patient or resident depending on transferring facility

Name of staff completing form (print): \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

*If information communicated prior to transfer:*

Name of individual at receiving facility: \_\_\_\_\_

Phone of individual at receiving facility: \_\_\_\_\_

SAVE

PRINT

**Add Enhanced Barrier Precautions until the form is revised.**

## Example 2: Inter-facility Infection Prevention Transfer Form from Chicago Department of Public Health

[https://www.chicagohan.org/documents/14171/93622/Inter-facility+transfer+form\\_9\\_4\\_18.pdf/bedf5d63-a071-4d3c-ba52-2c4234ccc237](https://www.chicagohan.org/documents/14171/93622/Inter-facility+transfer+form_9_4_18.pdf/bedf5d63-a071-4d3c-ba52-2c4234ccc237)

### Inter-facility Infection Prevention Transfer Form

When transferring patient/resident, please complete to the best of your ability to assist with care transitions.

#### Patient Information

Last Name \_\_\_\_\_ First Name \_\_\_\_\_  
Date of Birth \_\_\_\_/\_\_\_\_/\_\_\_\_

#### Isolation Precautions

The patient currently requires the following type(s) of isolation precautions.

- Contact precautions. Reason: \_\_\_\_\_
- Droplet precautions. Reason: \_\_\_\_\_
- Airborne precautions. Reason: \_\_\_\_\_
- The patient DOES NOT require isolation.

#### Infection/Colonization History (check all that apply)

- MRSA (Methicillin-resistant *Staphylococcus aureus*)
- VRE (Vancomycin-resistant enterococci)
- Clostridium difficile*
- Candida auris*
- Any MDRO gram-negative bacteria (multidrug-resistant). If known, please also specify:
- Carbapenem-resistant *Enterobacteriaceae* (examples: *Klebsiella* or *E. coli* with KPC, NDM-1)
  - Acinetobacter*, multidrug-resistant
  - ESBL (extended spectrum beta-lactamase) bacteria
  - Pseudomonas aeruginosa*, multidrug-resistant
- Respiratory Illness (influenza, adenovirus, etc., suspected or confirmed) — Droplet Precautions
- Respiratory Illness (tuberculosis, etc., suspected or confirmed) — Airborne Precautions
- Any other pathogen requiring isolation. Please list: \_\_\_\_\_

#### Sending Facility Information

Facility Name \_\_\_\_\_ Unit \_\_\_\_\_  
Address \_\_\_\_\_ Phone \_\_\_\_\_

#### Person Completing Form

Name/Title \_\_\_\_\_  
Phone \_\_\_\_\_  
Email/Fax \_\_\_\_\_

#### Infection Prevention Designee

Name \_\_\_\_\_  
Phone \_\_\_\_\_  
Email/Fax \_\_\_\_\_

Please send copies of any relevant microbiology cultures, medication administration record (MAR) or physician order sheet (POS), and immunization documentation.

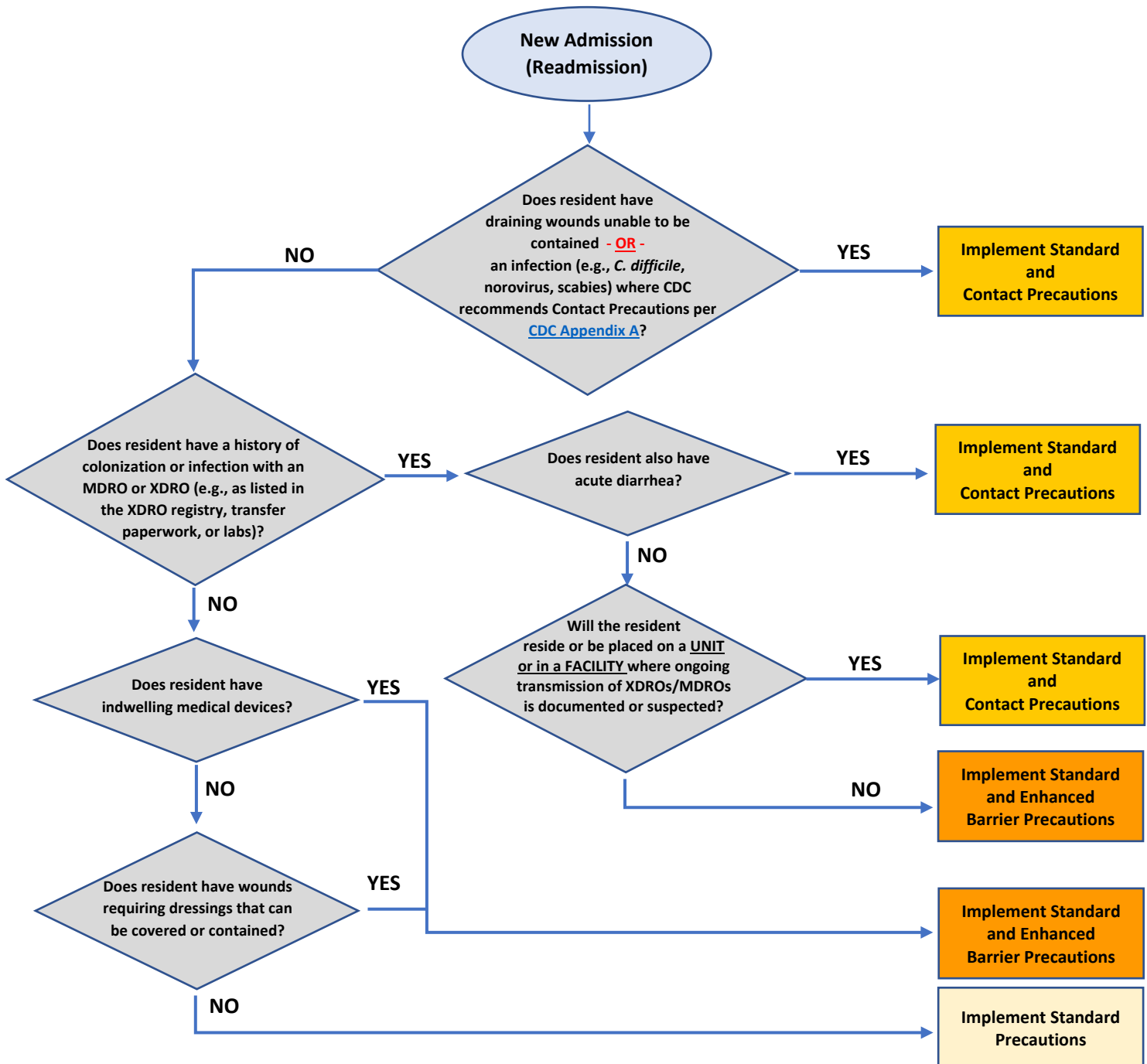
Version 1.3 9/4/18

Add Enhanced  
Barrier Precautions  
until the form is  
revised.



Appendix D: Algorithm for New Admissions

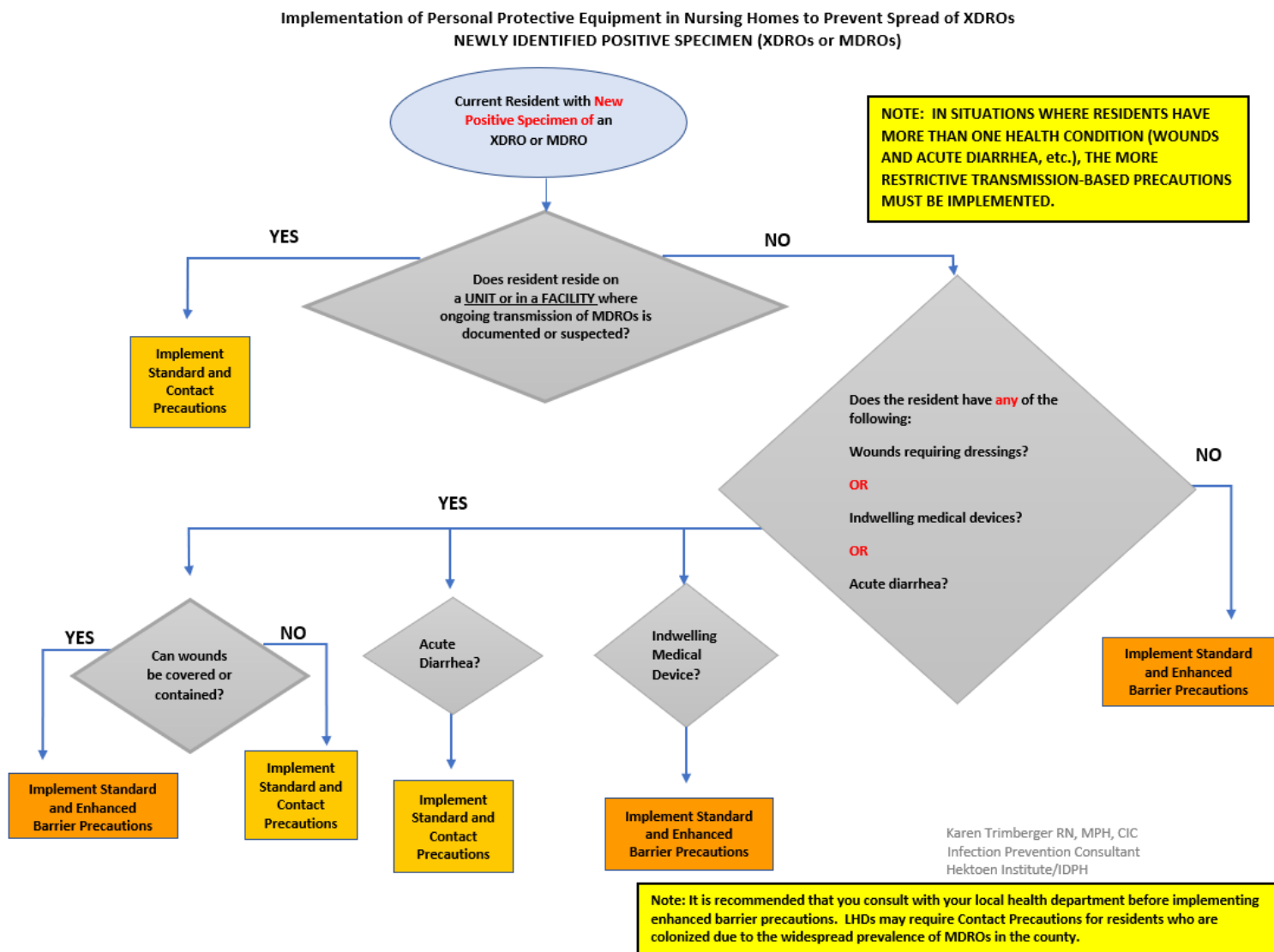
**Implementation of Personal Protective Equipment in Nursing Homes to Prevent Spread of XDROs  
NEW ADMISSIONS (Readmissions)**



**NOTES:** In situations where residents have more than one health condition (e.g., wounds AND acute diarrhea), THE MORE RESTRICTIVE TRANSMISSION-BASED PRECAUTIONS MUST BE IMPLEMENTED.

It is recommended that you consult with your local health department (LHD) before implementing enhanced barrier precautions. LHDs may require Contact Precautions for residents who are colonized due to the widespread prevalence of MDROs in the county.

Appendix E: Algorithm for Newly Identified Positive Specimen (Novel or Targeted XDROs)




Appendix F: Table 1. Room Placement and Type of Transmission-Based Precautions Required for Residents with MDROs or XDROs

Pathogens or Risk factors	Room Placement for Residents with Specified Pathogens	Type of Transmission-Based Precautions	Duration of Isolation
Pathogens requiring contact precautions (e.g., <i>C. difficile</i> , norovirus, scabies) or a condition for which contact precautions are recommended in <a href="#">Appendix A</a> (Type and Duration of Precautions Recommended for Selected Infections and Conditions) of the CDC guideline for isolation precautions.	Ideally a single or private room. Cohorting may be done with like organisms when necessary.	Contact precautions	Duration of illness: Use CDC <a href="#">Appendix A</a> document for duration of isolation.
Wounds with uncontained drainage and/or diarrhea.	Single or private room.	Contact precautions	Until drainage can be contained or wound heals or closes.
Non-ambulatory/bedbound residents on vent floor (vSNFs) with confirmed XDRO regardless of mechanism (e.g., CRE, CRAB, <i>C. auris</i> ).	Ideally a single/private room. Cohorting may be done with like organisms when necessary.	Enhanced barrier precautions	Duration of a resident's stay in the facility.
<b>NOTE: Do not cohort residents with positive XDRO colonization or infection with residents who have negative or unknown MDRO or XDRO AND are either immunocompromised, have indwelling devices, or have wounds. (IDPH recommendation)</b>			
<b>The following residents with XDRO pathogens and specific mechanisms may be cohorted or placed together in the same room.</b>			
May Cohort: <b>Endemic XDRO</b> pathogens: CRE-KPC, CRAB OXA-23, CRAB OXA 24/40, or other CPOs with unknown mechanisms and/or indwelling medical devices or wounds. <b>(IDPH recommendation)</b>	Residents may be placed in a single/private room or in a multi-occupancy room.	Enhanced barrier precautions	Duration of a resident's stay in the facility.
May Cohort: <b>Rare or low-prevalence XDRO</b> pathogens (e.g., CRE-NDM or CRE-VIM) and/or indwelling medical devices or wounds. <b>(IDPH recommendation)</b>	Residents may be placed in a single/private room or in a multi-occupancy room.	Enhanced barrier precautions	Duration of a resident's stay in the facility.
May Cohort: Residents with <b>co-infections involving any CPOs and <i>C. auris</i></b> can be cohorted with other residents with CPOs and <i>C. auris</i> co-infections. <b>NOTE: Do not cohort residents unless the co-infections are identical, and the facility consults with the LHD.</b>	Residents may be placed in a single/private room or in a multi-occupancy room.	Enhanced barrier precautions	Duration of a resident's stay in the facility.

Appendix G: Enhanced Barrier Precautions Sign

English: <https://www.cdc.gov/hai/pdfs/containment/enhanced-barrier-precautions-sign-P.pdf>

Spanish: <https://www.cdc.gov/hai/pdfs/containment/spanish-enhanced-barrier-precautions-sign-P.pdf>



**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.**

CS19-306149-A



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

## Appendix H: Contact Precautions Sign

English: <https://www.cdc.gov/infectioncontrol/pdf/contact-precautions-sign-P.pdf>Spanish: <https://www.cdc.gov/infectioncontrol/pdf/spanish-contact-precautions-sign-P.pdf>


**STOP**

**CONTACT  
PRECAUTIONS**

**STOP**

**EVERYONE MUST:**

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

**PROVIDERS AND STAFF MUST ALSO:**

 **Put on gloves before room entry.  
Discard gloves before room exit.**

 **Put on gown before room entry.  
Discard gown before room exit.**

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

 **Use dedicated or disposable equipment.  
Clean and disinfect reusable equipment  
before use on another person.**

CS19-306149-A

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

Appendix I: Droplet Precautions Sign

English: <https://www.cdc.gov/infectioncontrol/pdf/droplet-precautions-sign-P.pdf>

Spanish: <https://www.cdc.gov/infectioncontrol/pdf/spanish-droplet-precautions-sign-P.pdf>



The sign is a dark green rectangle with rounded corners. At the top, two red octagonal stop signs with white borders and the word "STOP" in white are positioned on either side of the main title. The main title "DROPLET PRECAUTIONS" is in large, bold, white capital letters. Below it, "EVERYONE MUST:" is in bold yellow capital letters, followed by the instruction "Clean their hands, including before entering and when leaving the room." in white. In the center is a white rounded square containing an illustration of a hand being sprayed with blue liquid from a bottle labeled "ABHR". Below this is the instruction "Make sure their eyes, nose and mouth are fully covered before room entry." in white. This is followed by two white rounded squares, each containing an illustration of a person in a white lab coat wearing either a full face shield and a light blue surgical mask, or safety goggles and a light blue surgical mask. The word "or" is placed between these two illustrations. At the bottom, the instruction "Remove face protection before room exit." is written in white. In the bottom right corner, there is a blue rounded rectangle containing the CDC logo and the text "U.S. Department of Health and Human Services Centers for Disease Control and Prevention". On the left side, there is a vertical code "CS19-306149-A".

**STOP** **DROPLET PRECAUTIONS** **STOP**

**EVERYONE MUST:**  
Clean their hands, including before entering and when leaving the room.




Make sure their eyes, nose and mouth are fully covered before room entry.



or



Remove face protection before room exit.



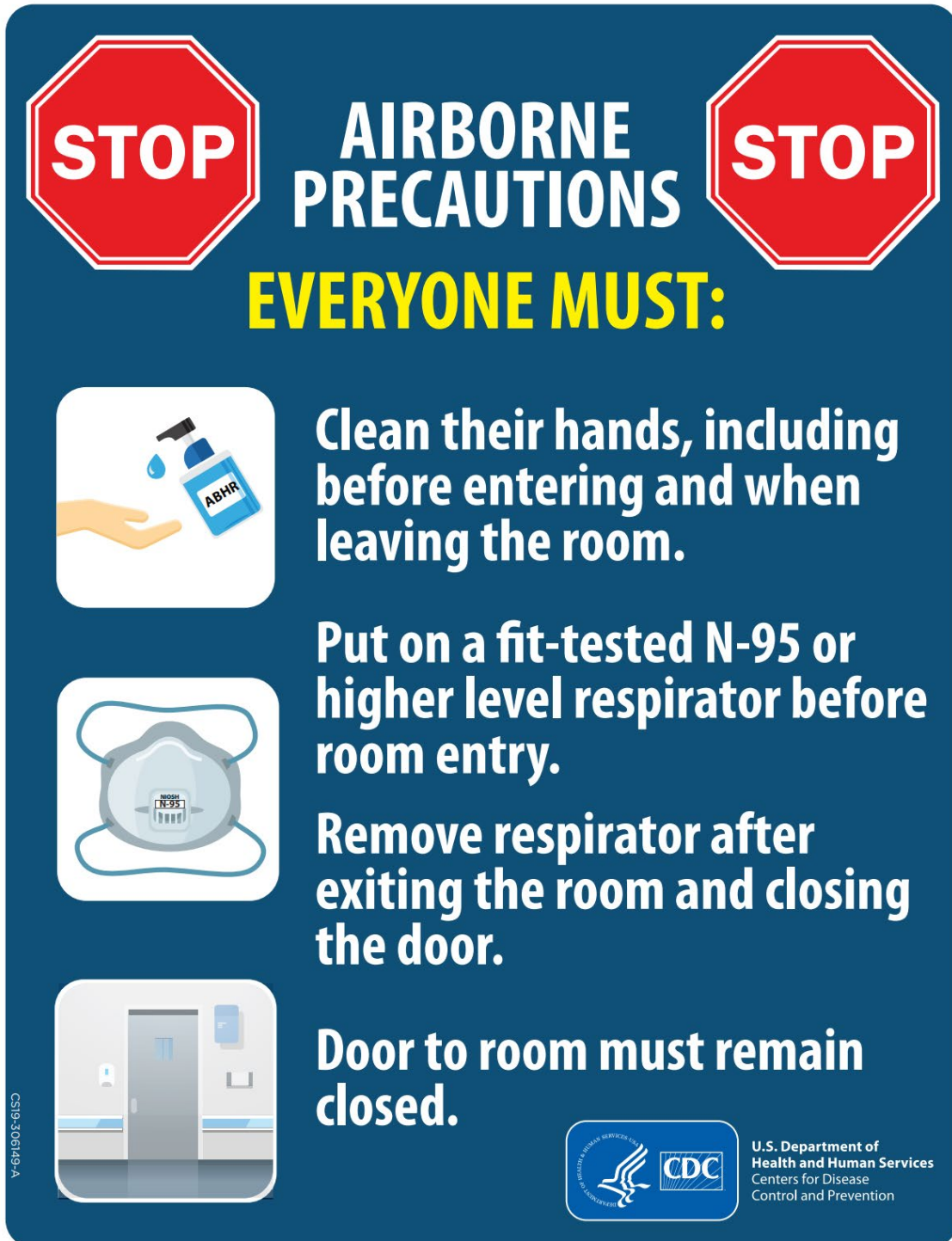
U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

CS19-306149-A

Appendix J: Airborne Precautions Sign

English: <https://www.cdc.gov/infectioncontrol/pdf/airborne-precautions-sign-P.pdf>

Spanish: <https://www.cdc.gov/infectioncontrol/pdf/spanish-airborne-precautions-sign-P.pdf>




The sign is a dark blue rectangle with rounded corners. At the top, it features two red octagonal stop signs with white borders and the word "STOP" in white. Between these signs, the words "AIRBORNE PRECAUTIONS" are written in large, white, bold, sans-serif capital letters. Below this, the phrase "EVERYONE MUST:" is written in bold, yellow, sans-serif capital letters. The sign contains three rows of instructions, each with an icon on the left and text on the right. The first row shows a hand being washed with blue liquid from a bottle labeled "ABHR", with the text "Clean their hands, including before entering and when leaving the room." The second row shows a grey N-95 respirator mask, with the text "Put on a fit-tested N-95 or higher level respirator before room entry." The third row shows a closed grey door in a room, with the text "Remove respirator after exiting the room and closing the door." and "Door to room must remain closed." At the bottom right, there is the CDC logo (a stylized eagle) and the text "U.S. Department of Health and Human Services Centers for Disease Control and Prevention". On the left side, there is a vertical code "CS19-306149-A".


**STOP**


**AIRBORNE PRECAUTIONS**

**STOP**


**EVERYONE MUST:**

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

 Put on a fit-tested N-95 or higher level respirator before room entry.

 Remove respirator after exiting the room and closing the door.

**Door to room must remain closed.**

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

CS19-306149-A

## Appendix K: Checklist for Selection of Disinfectant

Dr. Rutala and Dr. Weber's Considerations for Selecting the Optimal Disinfectant for Your Facility <sup>14</sup>		
Directions: When determining the optimal disinfecting product for surface disinfection in your facility, consider each of the five components below and give each product a score (1 is worst and 10 is best) in each of the five categories. Select the product with the highest score as the optimal product choice.		
Consideration	Questions to Ask	Score (1-10) Maximum Score is 50
1. Kill claims	Does the product kill the most prevalent health care pathogens, including those that: <ul style="list-style-type: none"> <li>• Cause most healthcare-associated infections?</li> <li>• Cause most outbreaks?</li> <li>• Are of concern in your facility?</li> </ul>	
2. Kill and wet contact times	How quickly does the product kill the prevalent health care pathogens? Does the product keep the surfaces visibly wet for the kill times listed on the label?	
3. Safety	Does the product have an acceptable toxicity rating? Does the product have an acceptable flammability rating? Is a minimal level of personal protective equipment required? Is the product compatible with the common surfaces in your facility?	
4. Ease of Use	Is the product odor considered acceptable? Does the product have an acceptable shelf life? Does the product come in convenient forms to meet your facility's needs (e.g., liquids, sprays, refills, multiple wipe sizes)? Does the product work in the presence of organic matter? Is the product water soluble? Does the product clean and disinfect in a single step? Are the directions for use simple and clear?	
5. Other factors	Does the supplier offer comprehensive training and ongoing education, both in person and virtual? Does the supplier offer 24/7 customer support? Is the overall cost of the product acceptable (considering product capabilities, cost of infections that may be prevented, and costs per compliant use)? Can the product help standardize the disinfectants used in the facility?	





Appendix M: PowerPoint Education

**Implementing Personal Protective Equipment in Nursing Homes**

To view a recording of the presentation, click [here](#) (passcode: 4=Syh=jW).

To access the PowerPoint slides for education and training of staff, click [here](#).

**IMPLEMENTING  
PERSONAL PROTECTIVE EQUIPMENT  
IN NURSING HOMES  
TO PREVENT THE SPREAD OF  
EXTENSIVELY DRUG-RESISTANT ORGANISMS (XDROS)  
& MULTIDRUG RESISTANT ORGANISMS (MDROS)**

Karen Trimberger RN, MPH, NE-BC, CIC  
Infection Prevention Consultant  
Hektoen Institute/Illinois Department of Public Health

Introducing Enhanced  
Barrier Precautions

## Appendix N: Post In-Service Exam

Implementing Personal Protective Equipment in Nursing Homes  
Post In-service Test

1. Enhanced Barrier Precautions are a new type of Transmission-Based Precautions.  
 True  False
2. Enhanced Barrier Precautions are to be used for high-contact patient care activities.  
 True  False
3. Which of the following is NOT a high-contact activity?  
 Toileting  Wound care  
 Changing linen  None of the Above. All are high-contact activities.
4. Residents in Contact Precautions must remain in their room (room restrictions).  
 True  False
5. Residents in Enhanced Barrier Precautions must remain in their room (room restrictions).  
 True  False
6. Where do Enhanced Barrier Precautions fall within the continuum of care?  
 Contact Precautions, Standard Precautions, Enhanced Barrier Precautions  
 Standard Precautions, Enhanced Barrier Precautions, Contact Precautions  
 Standard Precautions, Contact Precautions, Enhanced Barrier Precautions
7. Enhanced Barrier Precautions do **NOT** require the use of gowns and gloves for high-contact patient care activities.  
 True  False
8. Colonization is when bacteria are present in or on the body but not causing symptoms or disease.  
 True  False
9. New CDC guidance on personal protective equipment use in nursing homes was created to prevent the spread of novel or targeted multidrug-resistant organisms.  
 True  False
10. Hand hygiene with an alcohol-based hand rub should be performed at the entry and exit of the resident's room.  
 True  False

## Appendix O: Post-Test Key

**EBP Toolkit: Implementing Personal Protective Equipment in Nursing Homes**  
**Post In-service Test -- KEY**

1. Enhanced Barrier Precautions are a new type of Transmission-Based Precautions.  
 True  False
2. Enhanced Barrier Precautions are to be used for high-contact patient care activities.  
 True  False
3. Which of the following is NOT a high-contact activity?  
 Toileting  Wound care  
 Changing linen  None of the Above. All are high-contact activities.
4. Residents in Contact Precautions must remain in their room (room restrictions).  
 True  False
5. Residents in Enhanced Barrier Precautions must remain in their room (room restrictions).  
 True  False
6. Where do Enhanced Barrier Precautions fall within the continuum of care?  
 Contact Precautions, Standard Precautions, Enhanced Barrier Precautions  
 Standard Precautions, Enhanced Barrier Precautions, Contact Precautions  
 Standard Precautions, Contact Precautions, Enhanced Barrier Precautions
7. Enhanced Barrier Precautions do **NOT** require the use of gowns and gloves for high-contact patient care activities.  
 True  False
8. Colonization is when bacteria are present in or on the body but not causing symptoms or disease.  
 True  False
9. New CDC guidance on personal protective equipment use in nursing homes was created to prevent the spread of novel or targeted multidrug-resistant organisms.  
 True  False
10. Hand hygiene with an alcohol-based hand rub should be performed at the entry and exit of the resident's room.  
 True  False

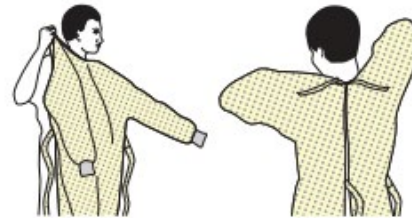
## Appendix P: CDC Donning and Doffing Sequence

## SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

### 1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



### 2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



### 3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



### 4. GLOVES

- Extend to cover wrist of isolation gown



## USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene



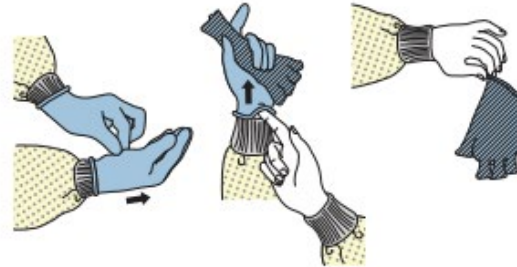
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## HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

### 1. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in a waste container



### 2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container



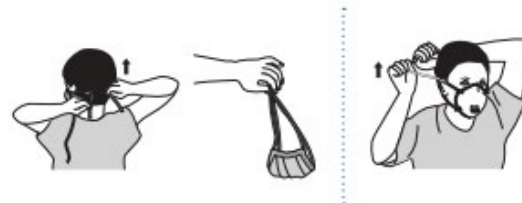
### 3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container

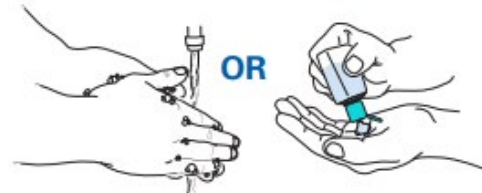


### 4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — **DO NOT TOUCH!**
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



### 5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



**PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE**



## HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. **Remove all PPE before exiting the patient room** except a respirator, if worn. Remove the respirator **after** leaving the patient room and closing the door. Remove PPE in the following sequence:

### 1. GOWN AND GLOVES

- Gown front and sleeves and the outside of gloves are contaminated!
- If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
- While removing the gown, fold or roll the gown inside-out into a bundle
- As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container



### 2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container

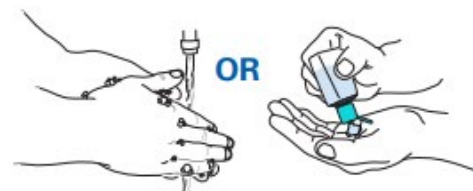


### 3. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — **DO NOT TOUCH!**
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



### 4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



**PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS  
BECOME CONTAMINATED AND IMMEDIATELY AFTER  
REMOVING ALL PPE**



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## Appendix Q: Personal Protective Equipment (PPE) Competency Validation

**Donning and Doffing**

Type of validation: Return demonstration

Orientation:  Annual:  Other: 

Employee Name: \_\_\_\_\_

Job Title: \_\_\_\_\_

Donning PPE	Competent	
	Yes	No
1. Perform hand hygiene.		
2. Don Gown: Ensure gown covers from neck to knees.		
3. Tie/fasten gown at back of neck and waist.		
4. Don Mask/Respirator: Ensure ties/elastic bands are secure.		
5. Pinch flexible band at the nose.		
6. Fit snug to face and below the chin (Fit-check respirator if applicable).		
7. Don Eye Protection (goggles or face shield): Place over face and eyes; adjust to fit.		
8. Don Gloves: Extend to cover wrist of gown.		
DoFFing PPE		
9. Remove Gloves: Grasp outside of glove with opposite gloved hand and peel off.		
10. Hold removed glove in the gloved hand.		
11. Slide fingers of ungloved hand under remaining glove at the wrist.		
12. Peel glove off over first glove.		
13. Discard gloves in the waste container.		
14. Remove eye protection. Handle by the head band or earpieces.		
15. Discard in designated waste container.		
16. Remove Gown: Unfasten ties or snaps.		



17. Pull away from neck and shoulders, touching inside of gown only.		
18. Turn gown inside out.		
19. Fold or roll into a bundle and discard.		
20. Remove mask/respirator (respirator removed after exit room/closed door); grasp bottom, then top ties or elastics and remove.		
21. Discard in the waste container.		
22. Perform hand hygiene.		
Standard Precautions and Transmission-Based Precautions		
23. Staff correctly identifies the appropriate PPE for the following scenarios:		
a. Standard Precautions (intact skin or anticipates splashing)		
b. Enhanced Barrier Precautions		
c. Contact Precautions		
d. Droplet Precautions		
e. Airborne Precautions (fit-tested respirator if applicable)		

Comments or follow-up actions:

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Employee Signature: \_\_\_\_\_

Validator Signature: \_\_\_\_\_

Date: \_\_\_\_\_