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To: Skilled Nursing Facilities

CC: Local Health Departments, IDPH Office of Health Care Regulation

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Subject: Use of Transmission-Based Precautions and Room Placement Options for Extensively Drug-Resistant Organisms in Skilled Nursing Facilities

The control of multidrug-resistant organisms (MDROs), extensively drug-resistant organisms (XDROs), and emerging pathogens is particularly challenging in skilled nursing facilities (SNFs). The purpose of the attached document is to summarize best practices for the use of transmission-based precautions in SNFs and to assist with decision-making regarding the placement of residents with organisms of concern. The guidance will help with determining whether to place a resident on Contact Precautions or Enhanced Barrier Precautions in SNFs.

Additional resources will be available in the near future. Please direct any questions to dph.xdroregistry@illinois.gov.

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Use of Transmission-Based Precautions and Room Placement Options
for Extensively Drug-Resistant Organisms
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Purpose

Congregate care settings encourage socialization and interaction among residents. As a result, control of multidrug-resistant organisms (MDROs), extensively drug-resistant organisms (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. ***This document summarizes best practices and assists with decision making when deciding whether to place a resident on Contact Precautionsⁱ or Enhanced Barrier Precautionsⁱⁱ.*** Considerations included in the decision-making process may include regional and facility level prevalence of organisms of concern and the acuity of care provided at the skilled nursing facility. 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 will be indicated with “(IDPH Recommendation).” Recommendations may be subject to change should the prevalence of XDROs change across the state.

While these recommendations can help guide practice, local health departments may recommend stricter containment and control measures based on prevalence in the jurisdiction or surrounding jurisdictions.

Discussion and Recommendations

For the purposes of this document, the terms **MDRO** and **XDRO** refer to organisms listed below.

MDRO refers 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*.

XDRO refers to organisms that are being entered into the XDRO registry: *Candida auris*, carbapenem-resistant Enterobacterales, carbapenem-resistant *Acinetobacter baumannii*, and carbapenemase-producing *Pseudomonas aeruginosa*.

Standard precautions are intended to be applied to the care of patients in health care settings, regardless of the suspected or confirmed presence of an infectious agent. Implementation of standard precautions, including hand hygiene and environmental cleaning and disinfection with an appropriate agent, constitutes the primary strategy for the prevention of health care-associated transmission of infectious agents among patients and health care personnel.

Transmission-based precautions (TBP) are for patients known or suspected to be infected or colonized with infectious agents, including certain epidemiologically important pathogens, which require additional control measures to effectively prevent transmission. ⁱⁱⁱ TBPs include airborne, droplet, contact, and enhanced barrier

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precautions (EBP). TBP 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.

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, prevalence, or incidence of MDROs in the facility).

When implementing TBP among residents in long-term care facilities, consider using one or more of the following facility-level approaches, keeping in mind that standard precautions should be used on all residents during all care:

Pathogen-based

a) **XDROs**: EBP should be used for residents with an **XDRO** unless the resident has draining wounds that can't 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.

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.

Contact Precautions

1. 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*).^{iv}
2. Wear a gown and gloves for all interactions with the patient or potentially contaminated areas in the patient's or resident's environment. Donning personal protective equipment (PPE) upon room entry and discarding before exiting the patient room.

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3. 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.
4. Residents are restricted to their rooms except for medically necessary care and are not allowed to participate in communal dining and group activities.
5. 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.
6. Use contact precautions for the following:
 - a. Residents with draining wounds that cannot be contained (e.g., who cannot maintain adequate hygiene) and/or diarrhea, regardless of MDRO status.
 - b. Residents with *C. difficile* infection.
 - c. Residents who have another infection (e.g., norovirus, scabies) or condition for which contact precautions are recommended in CDC's [Appendix A](#).

Enhanced Barrier Precautions (EBP)

1. Single or private rooms are not required.
2. 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 (e.g., dressing, bathing/showering, transferring, providing hygiene, changing linens, changing briefs, or assisting with toileting, care or use of indwelling medical devices, wound care requiring a dressing)^v.
3. Residents are not restricted to their rooms.
4. Residents are allowed to participate in communal dining and group activities.
5. Disposable or dedicated medical equipment is not required; but any reusable medical equipment should be cleaned and disinfected with an appropriate agent between residents.
6. Because enhanced barrier precautions 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.***

Room Placement and Cohorting Options for Multi-Occupancy Rooms

NOTE: Ensure 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*** (either 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).

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2. Do not cohort someone **without evidence of an XDRO colonization/infection** (either negative on screening or never screened) with someone: **(IDPH recommendation)^{ii, iv}**
 - 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 without 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*).
5. Cohorting options for residents who are colonized or infected with **XDROs** are listed in the 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)^{ii, iv}**
 - i. Residents with co-infections involving any endemic carbapenemase-producing organisms (CPOs) and *C. auris* can be cohorted with other residents with endemic CPOs 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 CPOs 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 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^{iv}.
 - a. Before making changes involving complex cohorting decisions, facilities should contact their local health department (LHD). The LHD can assist in determining appropriate cohorting options based upon facility prevalence, types of XDROs in the facility, and bed availability.

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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 Appendix 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 Appendix 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.
NOTE: Do not cohort residents with positive XDRO colonization or infection with residents who have negative or unknown MDRO or XDRO and are immunocompromised or have indwelling devices or wounds. (IDPH recommendation)^{ii, iv}			
The following residents with XDRO pathogens and specific mechanisms may be cohorted or placed together in the same room.			
May Cohort: Endemic XDRO pathogens: CRE-KPC, CRAB OXA-23, CRAB OXA-24/40, or other CPOs with unknown mechanisms and/or indwelling medical devices or wounds. (IDPH recommendation)^{ii, iv}	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: Rare or low-prevalence XDRO pathogens (e.g., CRE-NDM or CRE-VIM) and/or indwelling medical devices or wounds. (IDPH recommendation)^{ii, iv}	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 co-infections involving any CPOs and <i>C. auris</i> can be cohorted with other residents with CPOs and <i>C. auris</i> co-infections. NOTE: Do not cohort residents unless the co-infections are identical, and the facility consults with the LHD.	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.

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Appendix. 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.

- **Endemic CPOs:** CRE-KPC, CRAB OXA 23, CRAB OXA 24/40, or other CPOs with unknown mechanisms.
- **Rare or low prevalence CPOs:** CRE-NDM or CRE-VIM.

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.

LHD: Local health department

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ⁱ Centers for Disease Control and Prevention. Infection Control. Transmission Based Precautions. Available at: <https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html>. Accessed March 6, 2023.

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ⁱⁱ Centers for Disease Control and Prevention. Healthcare-Associated Infections. Implementation of Personal Protective Equipment (PPE) Use in Nursing Homes to Prevent Spread of Multidrug-resistant Organisms (MDROs). Available at: <https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html>. Accessed March 6, 2023.

ⁱⁱⁱ Centers for Disease Control and Prevention. Infection Control. Transmission Based Precautions. Available at: <https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html>. Accessed March 6, 2023.

^{iv} Centers for Disease Control and Prevention. Infection Control. Transmission Based Precautions. Available at: <https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html>. Accessed March 31, 2023.

^v Centers for Disease Control and Prevention. Implementation of Personal Protective Equipment (PPE) Use in Nursing Homes to Prevent Spread of Multidrug-resistant Organisms (MDROs). Available at: <https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html>. Accessed March 31, 2023

^{vi} Centers for Disease Control and Prevention. *Candida auris*. Infection Prevention and Control. Available at: <https://www.cdc.gov/fungal/candida-auris/c-auris-infection-control.html>. Accessed April 5, 2023.