

MDRO

Enhanced Barrier Precautions

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Key Points

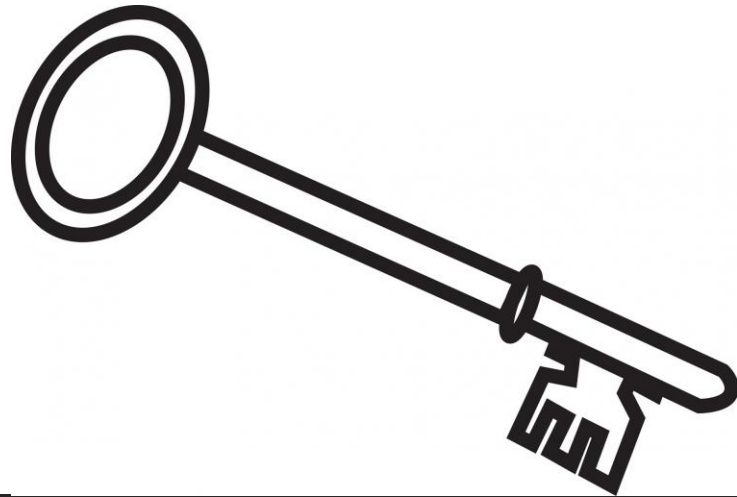
- Many nursing home residents are unknowingly colonized with MDRO, especially residents with risk factors like wounds or indwelling devices
- Residents who have a MDRO can develop serious infections, remain colonized for long periods of time and spread MDRO to others
- Healthcare personnel can spread MDRO through contaminated hands and clothing

Key Points

- Multi-Drug-resistant organism transmission is common in Nursing Facilities contributing to substantial morbidity and mortality and increased costs
- Enhanced Barrier Precautions are an effective infection control intervention designed to reduce transmission of resistant organisms that employs targeted gown and glove use during high contact resident care activities
- Enhanced Barrier Precautions may be indicated (when contact precautions do not otherwise apply) with any of the following:
 - Wounds or indwelling medical devices, regardless of MDRO colonization status
 - Infection or colonization with any MDRO

Key Points

- Effective implementation of Enhanced Barrier Precautions require staff training on the proper use of Personal Protective Equipment (PPE) and the availability of PPE and hand hygiene supplies at the point of care
- Standard precautions, which are a group of infection control practices, continue to apply to the care of all residents, regardless of suspected or confirmed infection or colonization status



Background

- Residents in nursing homes are at increased risk of becoming colonized and developing infection with MDRO
- More than 50% of nursing home residents may be colonized with MDRO
- Nursing homes have been the setting for MDRO outbreaks and when these outbreaks develop infections there are often limited treatment options available
- Implementation of contact precautions is often perceived as challenging as a facility attempts to balance PPE use and room restriction to prevent MDRO with quality of life—therefore many nursing facilities only implement contact precautions if active infection/treatment

Background

- Focusing only on residents with active infection fails to address transmission of MDRO colonization (which has no signs or symptoms)
- Colonization can persist for long periods of time and can contribute to the silent spread of MDRO
- Prompt response is needed for an effective response to the detection of serious antibiotic resistance threats, but traditional contact precautions are not always feasible for many residents



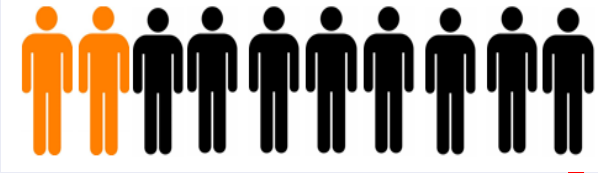

Risks for MDRO Colonization

- Indwelling devices
- Wounds
- Antibiotic use in prior 3 months, particularly fluoroquinolones
- Recent hospitalization
- Comorbid medical conditions
- Increased functional dependence

Healthcare networks drive spread of MDRO

- Increased risk in these settings/situations
 - Longer lengths of stay
 - Increased acuity
 - Decreased staff: patient ratios
 - Gaps in infection control practices

The Large Burden of MDROs in Nursing Homes

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



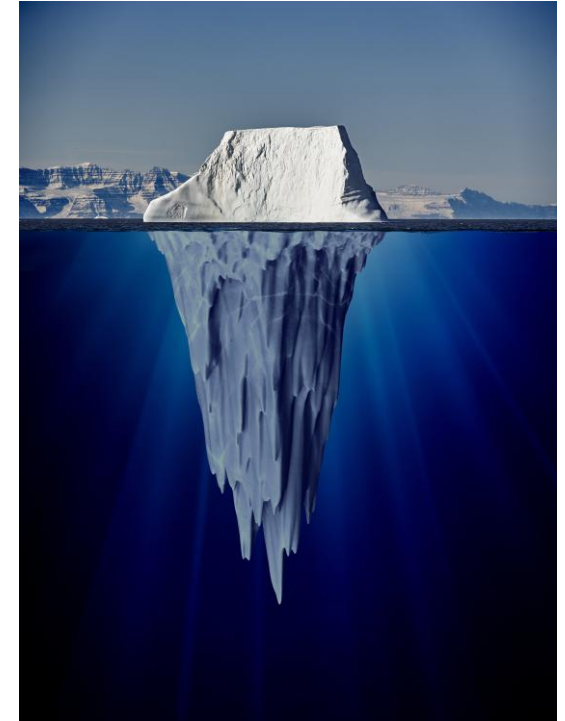
Known MDRO



No Known MDRO

Challenges with detection of MDRO

- Clinical cultures underestimate true prevalence of MDRO
- Most facilities not seeking to identify colonized patients (only seeking infections to address)
- Inadequate communication during care transitions



Focus

- Focusing only on residents with active infection fails to address the risk of transmission from residents with MDRO colonization which can persist for long periods of time and result in the silent spread of MDRO



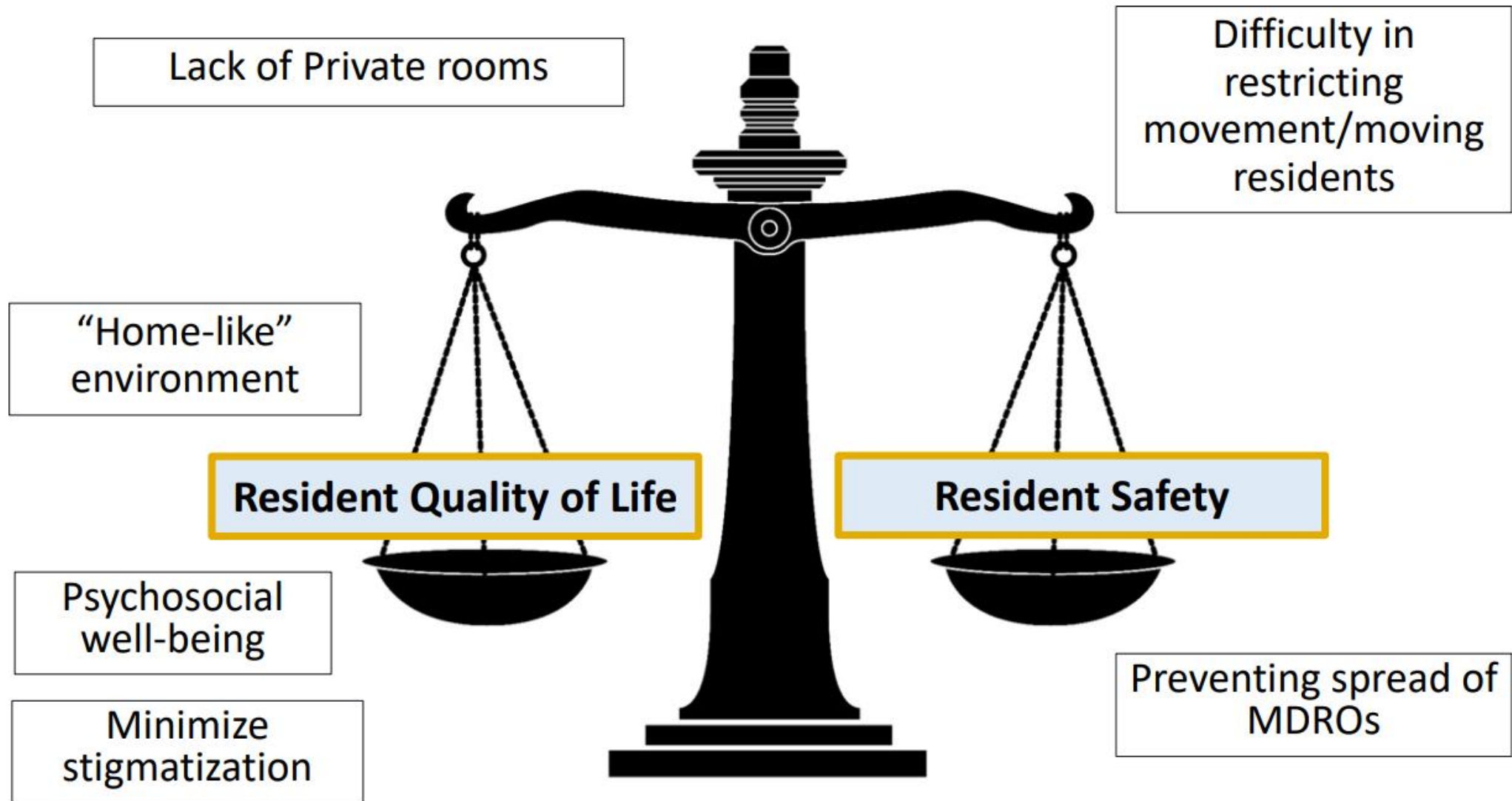
Characteristics of MDRO Targets in Healthcare

Resistance

Detection

Transmission

Spread



Need for New Approaches

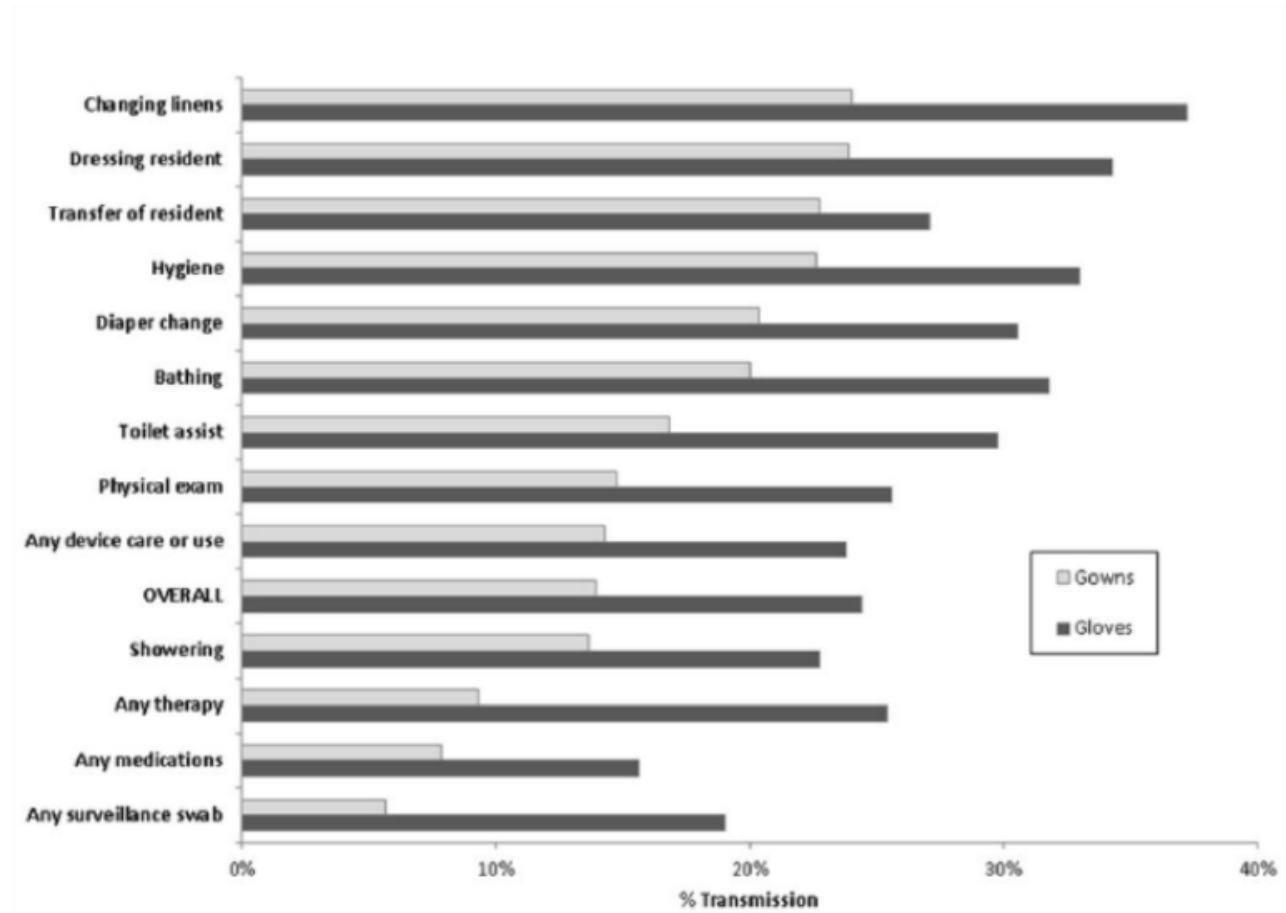
- Clarification on when and how to use PPE and how to prevent the spread of MDRO
- Balanced approach to managing prolonged colonization and preventing the silent spread of MDRO
- Consider which residents are at risk



MRSA Transmission to Gowns and Gloves of HCW during Care of Colonized Residents

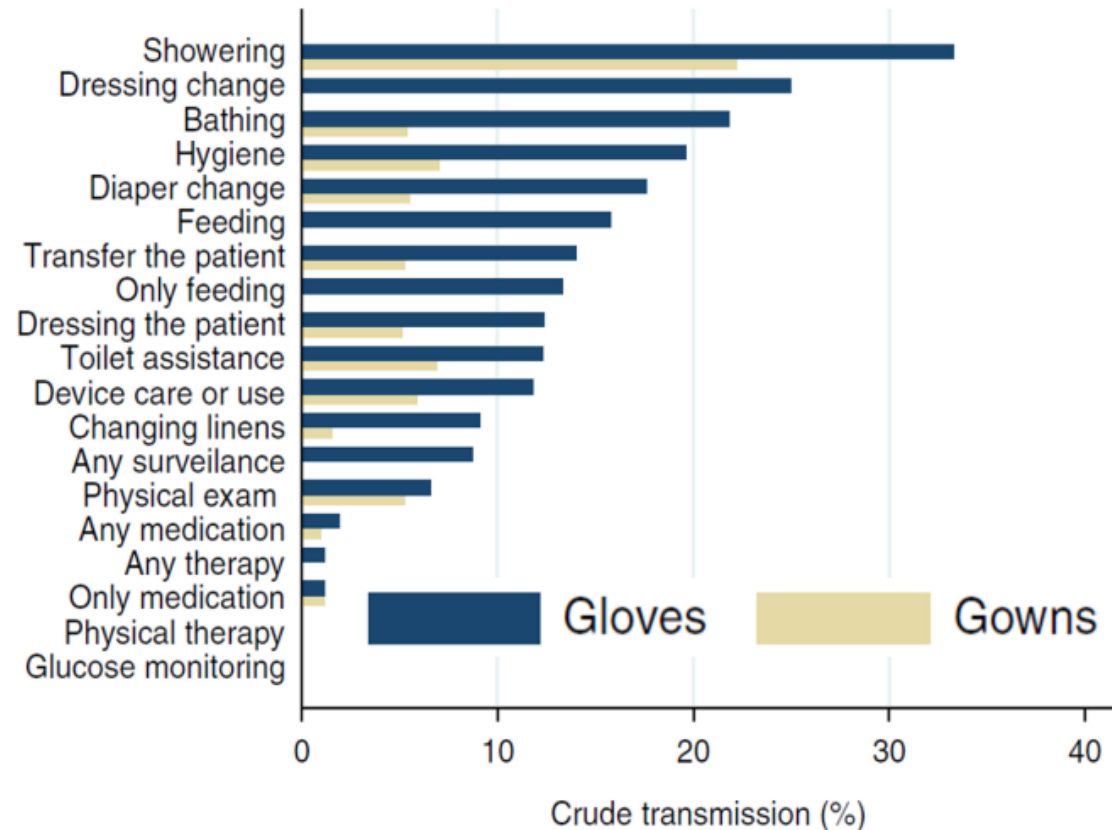
- **Highest Risk:**
 - Dressing
 - Transferring
 - Providing hygiene
 - Changing linens
 - Toileting
- **Lowest Risk:**
 - Giving Meds
 - Glucose monitoring

Roghmann et al. Infect Control Hosp Epidemiol.
2015 September; 36(9): 1050-1057



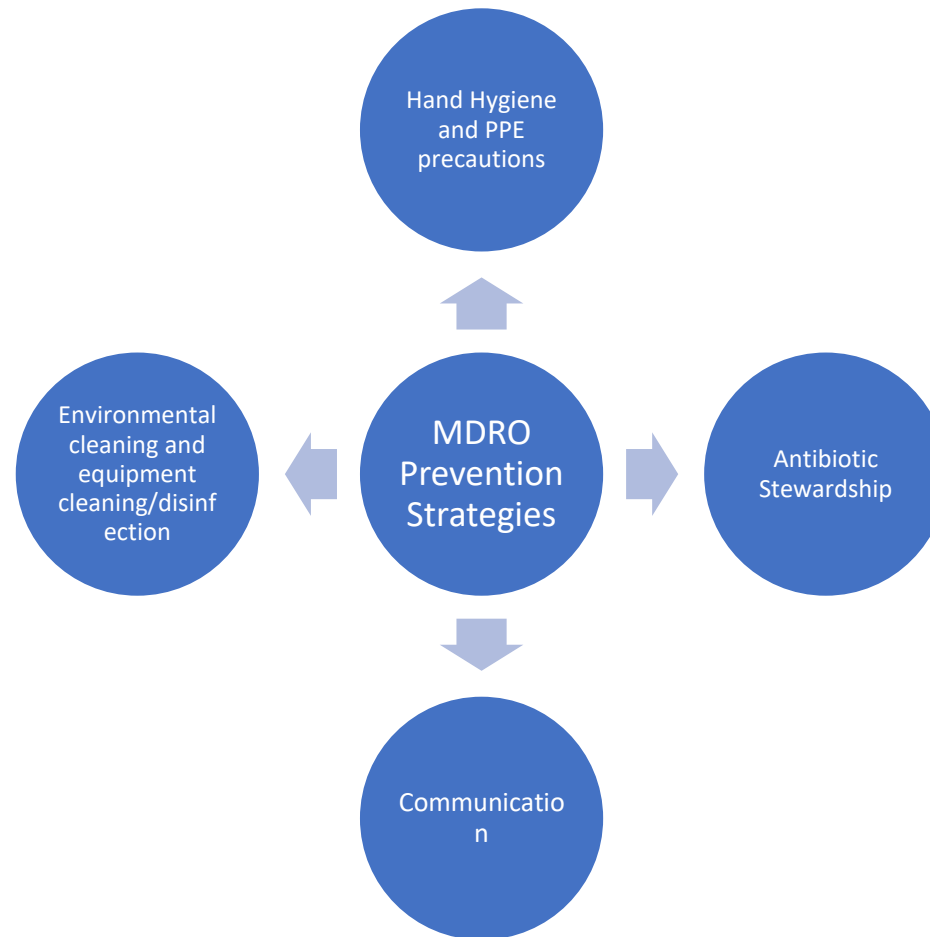
Resistant Gram-negative Bacteria (RGNB) Transmission to Gowns and Gloves of HCW during Care of Colonized Residents

- **Highest Risk:**
 - Showering
 - Hygiene
 - Toileting
 - Wound dressing changes
- **Lowest Risk:**
 - Assist feeding
 - Giving meds
 - Glucose monitoring



Blanco et al. Infect Control Hosp Epidemiol (2018), 39, 1425-1430

Core Strategies



Need for Enhanced Barrier Precautions (EBP)

- Historically, interventions in nursing homes have focused only on residents who are actively infected with an MDRO
- Need for a broader approach to reduce the spread of MDROs without isolating residents for long periods of time
- Recent studies have indicated the use of EBP can effectively reduce the spread of MDROs

Indications for Enhanced Barrier Precautions

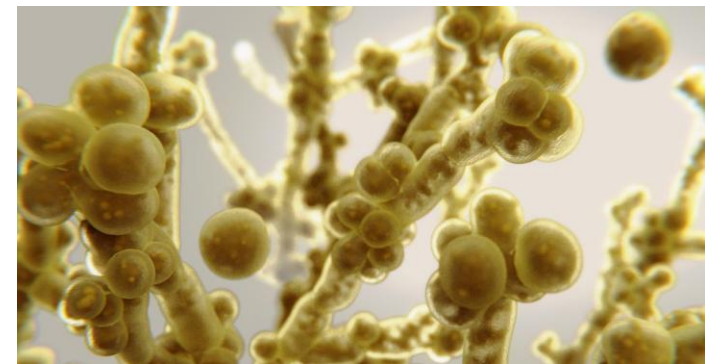
- EBP are indicated for nursing home residents with any of the following:
 - Infection or colonization with an MDRO *when Contact Precautions do not otherwise apply*
 - Wounds and/or indwelling medical devices
- EBP is not limited to outbreaks or specific MDROs

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Examples of MDRO targeted by the CDC

- ❑ Pan-Resistant Organisms
- ❑ Carbapenemase-producing carbapenem-resistant Enterobacterales
- ❑ Carbapenemase-producing carbapenem-resistant *Pseudomonas* spp.
- ❑ Carbapenemase-producing carbapenem-resistant *Acinetobacter baumannii*
- ❑ *Candida Aurus*



Other important MDRO include (but not limited to):

- ❑ MRSA-Methicillin Resistant Staph Aureus
- ❑ ESBL-producing Enterobacterales
- ❑ VRE-Vancomycin-resistant enterococci
- ❑ Multi drug resistant pseudomonas aeruginosa
- ❑ Drug resistant- Streptococcus Pneumoniae
- ❑ Clostridium Difficile

Precautions

- Standard Precautions
- Contact Precautions
- Enhanced Barrier Precautions



Standard Precautions

- A group of infection control practices that apply to all residents/patients, regardless of suspected or confirmed infection or colonization status
- Based on the principle that all body fluids, blood, secretions, excretions (except sweat) may contain transmissible infectious agents
- Proper selection of PPE is one component along with hand hygiene, safe injection practices, respiratory hygiene and cough etiquette, environmental cleaning and disinfections, and reprocessing of reusable medical equipment
- PPE use is based on staff interaction with residents and possible exposure to blood, body fluids, mucus membranes, non-intact skin, or potentially contaminated surfaces or equipment is anticipated

Contact Precautions—Transmission Based

- Transmission based precautions that are used when pathogen transmission is not completely interrupted by standard precautions
- Designed to prevent transmission of infectious agents, like MDRO, that spread through direct or indirect contact with the resident or their environment
- Requires gowns and gloves on every entry into the resident room. Dedicated equipment. Private room (or occasionally cohorted)—restricted to room except when medically necessary
- These are generally time-limited and should have a plan for discontinuation

Contact Precautions

- Acute diarrhea
- Drainage that cannot be contained
- Units where infection is documented or suspected
- Infection where contact precautions are indicated
- Should be lifted as soon as clinically appropriate

Challenges with Contact Precautions

- Increased depression (by up to 40%)
- Patient satisfaction decreases
- PPE fatigue
- Perceived stigma
- Financial burden
- Risk of decreased care
- Must have consistent criteria on when to discontinue
- Not appropriate for colonization without infection

Enhanced Barrier Precautions

- Expands the use of PPE and refers to the use of gowns and gloves during high contact care activities that may transfer MDRO agents to staff hands or clothing
- Residents with wounds or indwelling devices are at higher risk of acquisition or colonization with MDRO and the use of EBP are indicated when contact precautions do not apply
- Resident can come out of room and can participate in group activities
- Intended to remain in place unless the medical device is no longer present or the wound resolves
- Falls between standard precautions and contact precautions and are geared towards nursing homes

High Contact Resident Care

- Dressing
- Bathing
- Showering
- Transferring
- Hygiene
- Changing linen
- Changing briefs or toileting
- Device care or use: Feeding Tube, Central Line, Trach, Urinary Catheter etc.
- Wound Care

Change Gloves between residents



Difference between Contact vs EBP

Contact Precautions vs. EBP

Contact Precautions

- ▶ Perform hand hygiene
- ▶ Gown and gloves upon room entry regardless of activities to be performed
- ▶ Dedicated equipment
- ▶ Private room
- ▶ Room restriction
 - Not permitted to participate in group activities

Enhanced Barrier Precautions

- ▶ Perform hand hygiene
- ▶ Gown and gloves prior to high-contact care activity
- ▶ Note:
 - Does **not** require a single room
 - Does **not** require restrictions of movement/participation in group activities

Table: Summary of Personal Protective Equipment (PPE) Use and Room Restriction When Caring for Residents in Nursing Homes:

Accessible version: <https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html>

Precautions	Applies to	PPE used for these situations	Required PPE	Room restriction
Standard Precautions	All residents	Any potential exposure to: <ul style="list-style-type: none"> Blood Body fluids Mucous membranes Non-intact skin Potentially contaminated environmental surfaces or equipment 	Depending on anticipated exposure: gloves, gown, facemask or eye protection (Change PPE before caring for another resident)	None
Enhanced Barrier Precautions	All residents with <i>any of the following</i> : <ul style="list-style-type: none"> Infection or colonization with an MDRO <i>when Contact Precautions do not otherwise apply</i> Wounds and/or indwelling medical devices (e.g., central line, urinary catheter, feeding tube, tracheostomy/ventilator) <i>regardless of MDRO colonization status</i> 	During high-contact resident care activities: <ul style="list-style-type: none"> Dressing Bathing/showering Transferring Providing hygiene Changing linens Changing briefs or assisting with toileting Device care or use: central line, urinary catheter, feeding tube, tracheostomy/ventilator Wound care: any skin opening requiring a dressing 	Gloves and gown prior to the high-contact care activity (Change PPE before caring for another resident) (Face protection may also be needed if performing activity with risk of splash or spray)	None
Contact Precautions	All residents infected or colonized with a MDRO <i>in any of the following situations</i> : <ul style="list-style-type: none"> Presence of acute diarrhea, draining wounds or other sites of secretions or excretions that are unable to be covered or contained For a limited time period, as determined in consultation with public health authorities, on units or in facilities during the investigation of a suspected or confirmed MDRO outbreak When otherwise directed by public health authorities All residents who have another infection (e.g., <i>C. difficile</i> , norovirus, scabies) or condition for which Contact Precautions is recommended in Appendix A (Type and Duration of Precautions Recommended for Selected Infections and Conditions) of the CDC Guideline for Isolation Precautions.	Any room entry	Gloves and gown (Don before room entry, doff before room exit; change before caring for another resident) (Face protection may also be needed if performing activity with risk of splash or spray)	Yes, except for medically necessary care

Challenges to Implementation

- Gaps in adherence to Hand Hygiene—including limited access to ABHR
- Limited access to PPE and minimal use of precautions
- Improper product selection, use and frequency to reduce surface environmental contamination
- Inadequate cleaning/disinfection of shared items
- Poor communication especially at care transitions

Implementation

- Staff awareness of expectations about hand hygiene, gown and glove use, initial and refresher training, and access to supplies
- Be sure staff aware of who has devices and what precautions each person is on
- Be sure staff aware of what is considered high contact activity
- Accessibility of PPE including disposal
- Access to hand hygiene (readily available)
- Monitoring for adherence and opportunities for additional training
- Education to residents and visitors

How to Be Successful



Hand Hygiene



Environmental
Cleaning and
Disinfection



Enhanced
Barrier
Precautions



Auditing



Communication





ENHANCED BARRIER PRECAUTIONS EVERYONE MUST:



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

PROVIDERS AND STAFF MUST ALSO:



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

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



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



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

Scenarios

- Mrs. Smith is sent to the hospital for altered mental state and tests positive for pan-resistant *Pseudomonas aeruginosa*. After a short hospital stay, she improves and is sent back to your facility. What (if any) precautions should she be placed on:
 - A Contact Precautions
 - B Enhanced Barrier Precautions
 - C Contact + Enhanced Barrier Precautions
 - D No precautions are needed

ANSWER

- Enhanced Barrier precautions is the correct measure that needs to be employed for the care of Mrs. Smith



Scenarios

- Two weeks after Mrs. Smith returns, she is feeling better and returned to her baseline. Is it okay to discontinue Enhanced Barrier Precautions?
- A Yes, not needed once symptoms resolve
- B No, she should stay on EBP until she tests negative
- C No, she should stay on EBP during the entire duration of her stay

Answer

- She should stay on EBP for the duration of her entire stay



Scenarios

- One month after her hospitalization, Mrs. Smith, develops abdominal pain, diarrhea, and fever. She has been on Enhanced Barrier Precautions since her hospitalization. What is the correct course of action?
 - A She should be switched to Contact Precautions
 - B She should stay on EBP
 - C She should be switched to Contact Precautions; once Contact Precautions are no longer indicated, she should be placed back on EBP

Answer

- C She should be switched to Contact Precautions until no longer indicated then placed back in EBP



Scenarios

- Mr. Jones resides in a room on the same unit with Mrs. Smith (3 doors down)– he received dialysis and has a central line. What is the correct reason for placing him on EBP?
 - A He resides near Mrs. Smith and is at higher risk of acquiring a MDRO due to having an indwelling medical device
 - B He leaves the facility often to go to dialysis
 - C He has a serious co-morbidity

Answer

- A He is at higher risk for contracting a MDRO due to his central line



Other Considerations

- Screening testing to determine status for the purpose of implementing EBP is not recommended—risk factors, type of care, indwelling devices and wounds are the primary determination for EBP regardless of status
- Residents with wounds or any indwelling device should be placed on EBP regardless of MDRO status
- Residents on EBP do not require a private room but there should be space between beds to prevent inadvertent sharing of items, use of privacy curtains, increased disinfection and cleaning of environment, disinfection of shared equipment and handwashing and changing PPE between residents even if in same room
- Do not retest to DC EBP—they are designed to remain in place during the entire stay

Other Considerations

- Gowns and Gloves are the minimum for EBP---eye protection may be indicated if a potential splash
- Transfers in the dining room typically do not require gowns and glove use as the contact is limited and short in duration---typically applies in the resident room
- Therapy is defined as a high contact activity and extra cleaning and disinfection plus gown/glove use should be implemented
- Housekeeping only needs to wear (EBP) for close contact of linen changes but should always wear and change during contact precautions
- Appropriate use of signage

Summary

- Standard Precautions are for all patients all the time
- Transmission Based Precautions are indicated if Standard Precautions alone are not sufficient to prevent the spread of pathogens
- Enhanced Barrier Precautions
 - Used for LTC residents that are infected or colonized with a MDRO
 - Residents at risk (Medical devices, wounds etc.)
 - Less restrictive and intended for LTC use

Resources

- ▶ CDC Guidance - Enhanced Barrier Precautions
<https://www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/type-duration-precautions.html>
- ▶ FAQs about Enhanced Barrier Precautions in Nursing Homes
<https://www.cdc.gov/hai/containment/faqs.html>
- ▶ CDC Webinar: Preventing the Spread of Novel or Targeted Multidrug-resistant Organisms (MDROs) in Nursing Homes through Enhanced Barrier Precautions
https://emergency.cdc.gov/coca/calls/2019/callinfo_102419.asp
- ▶ Transmission-Based Precautions (guidance and free signage)
<https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html>
- ▶ Standard Precautions Guidance
<https://www.cdc.gov/infectioncontrol/basics/standard-precautions.html>
- ▶ 2019 Antibiotic Resistant Threats Report
<https://www.cdc.gov/drugresistance/biggest-threats.html>
- ▶ Appendix A: Type and Duration of Precautions Recommended for Selected Infections and Conditions
<https://www.cdc.gov/infectioncontrol/guidelines/isolation/appendix/type-duration-precautions.html>



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Questions or Comments

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