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Enhanced Barrier Precautions: Preventing Transmission of MDROs in the LTC Setting

Patricia McAuley, MSN, RN, CIC
Rhode Island Department of Health
Center for Acute Infectious Disease Epidemiology
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Disclosures and Disclaimers

- There are no financial disclosures to make.
- Disclaimer regarding use of materials developed by the CDC, ATSDR, HHS.
- This presentation is not an endorsement of any product or manufacturer.

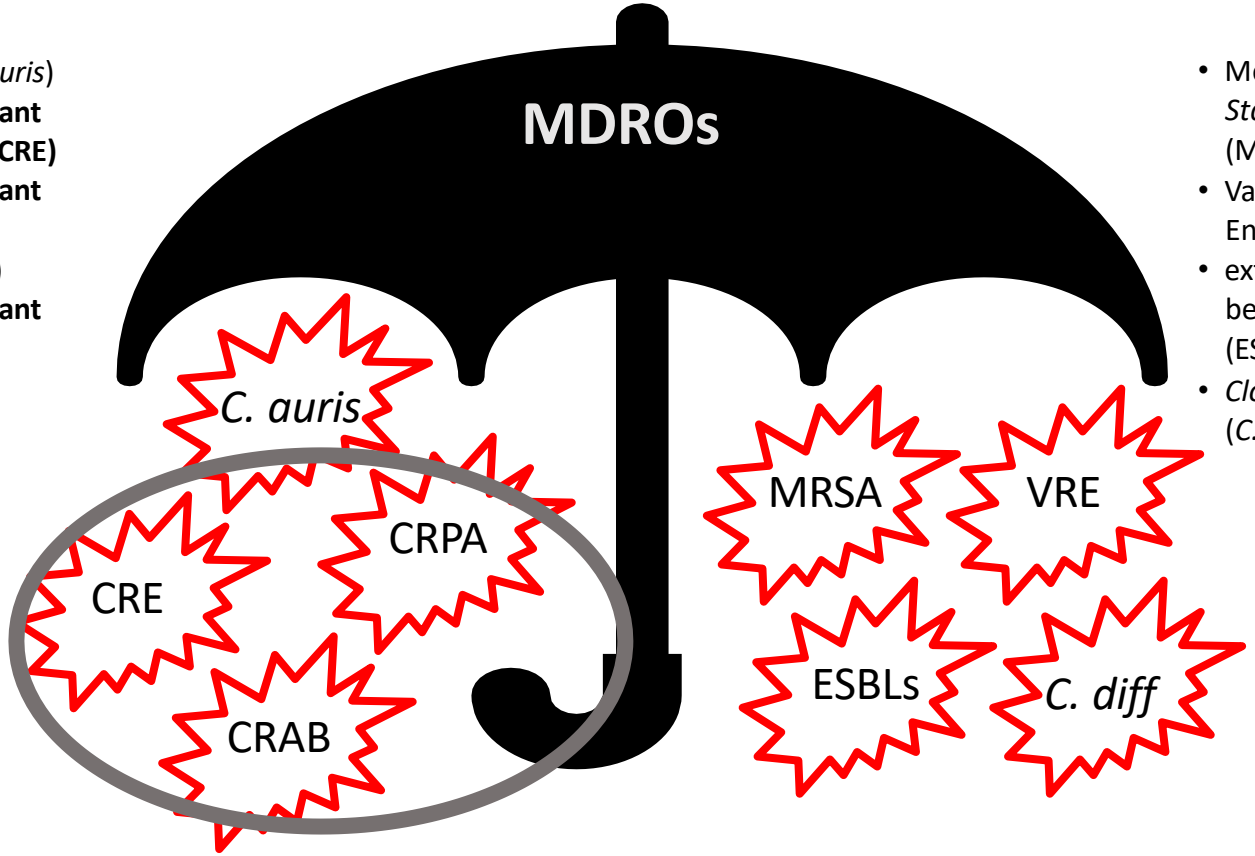
Objectives

- Describe the impact and burden of MDROs in the long-term care setting
- Discuss the need for Enhanced Barrier Precautions (EBP)
- Illustrate which residents EBP should be implemented for
- Identify high-contact resident care activities when EBP should be applied

Multi-drug Resistant Organisms (MDRO)

Multidrug-resistant Organisms

- Candida auris (*C. auris*)
- **Carbapenem-resistant Enterobacterales (CRE)**
- **Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)**
- **Carbapenem-resistant *Acinetobacter baumannii* (CRAB)**

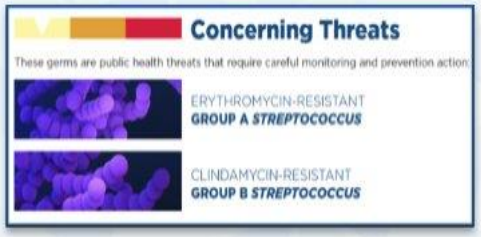


- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-resistant Enterococci (VRE)
- extended-spectrum beta-lactamases (ESBLs)
- *Clostridioides difficile* (*C. diff*)

Source: CDC, developed by CDC

CDC Antibiotic Resistance Threats Report

CDC Report on Antibiotic Resistance Threats in the United States - 2019



SIDP | SOCIETY OF INFECTIOUS DISEASES PHARMACISTS

Bacteria and Fungi Listed in the 2019 AR Threats Report

Urgent Threats

- Carbapenem-resistant *Acinetobacter*
- *Candida auris*
- *Clostridioides difficile*
- Carbapenem-resistant Enterobacterales
- Drug-resistant *Neisseria gonorrhoeae*

Serious Threats

- Drug-resistant *Campylobacter*
- Drug-resistant *Candida*
- ESBL-producing Enterobacterales
- Vancomycin-resistant *Enterococci* (VRE)
- Multidrug-resistant *Pseudomonas aeruginosa*
- Drug-resistant nontyphoidal *Salmonella*
- Drug-resistant *Salmonella* serotype Typhi
- Drug-resistant *Shigella*
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Drug-resistant *Streptococcus pneumoniae*
- Drug-resistant Tuberculosis

Concerning Threats

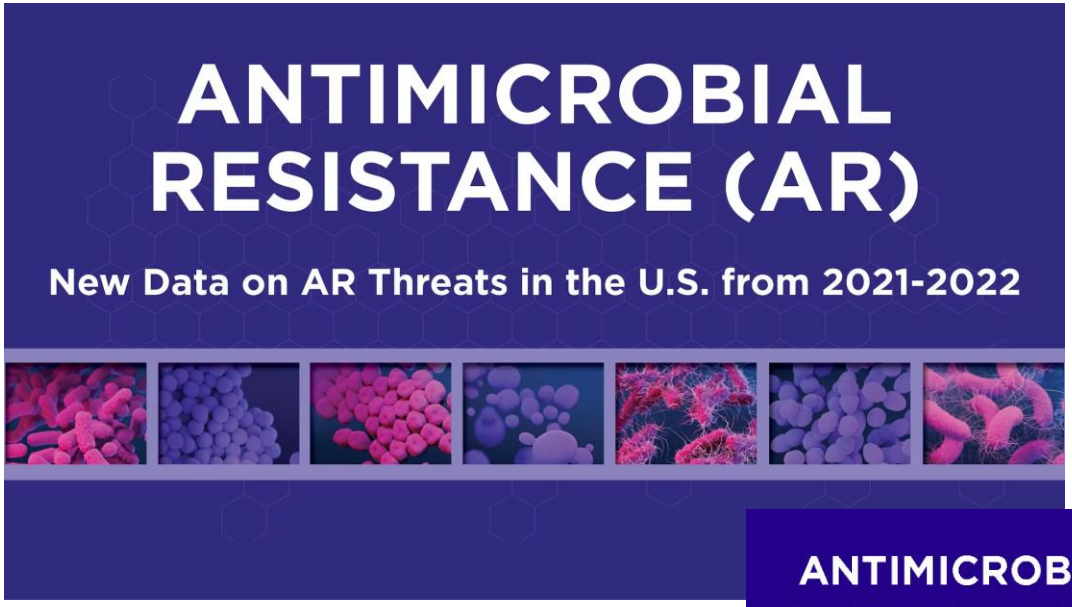
- Erythromycin-Resistant Group A *Streptococcus*
- Clindamycin-resistant Group B *Streptococcus*

Watch List

- Azole-resistant *Aspergillus fumigatus*
- Drug-resistant *Mycoplasma genitalium*
- Drug-resistant *Bordetella pertussis*

https://www.cdc.gov/drugresistance/biggest-threats.html

Antimicrobial Resistance Threats in the U.S., New Report

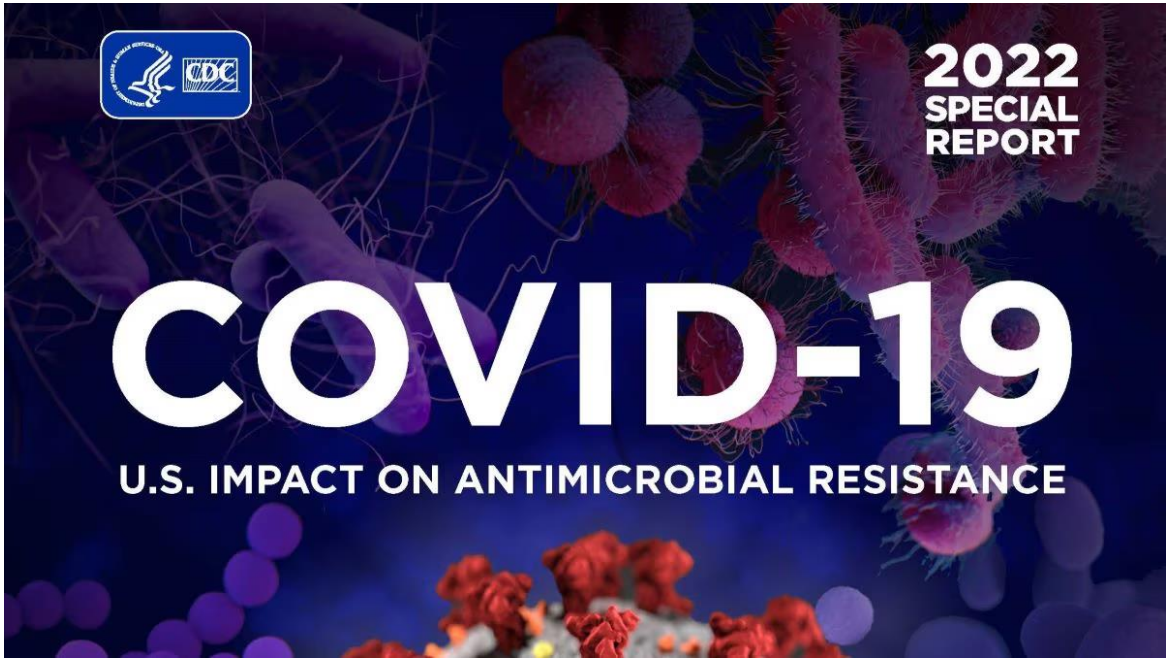


https://www.cdc.gov/antimicrobial-resistance/data-research/threats/update-2022.html

COVID-19 Impact on Antimicrobial Resistance

U.S. lost ground in combating antimicrobial resistance in 2020

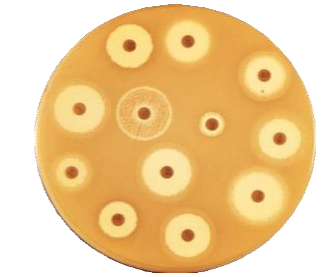
Report concluded the threat of antimicrobial resistant infections worsened

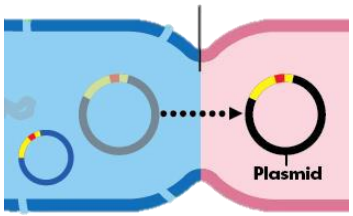


https://www.cdc.gov/antimicrobial-resistance/data-research/threats/COVID-19.html

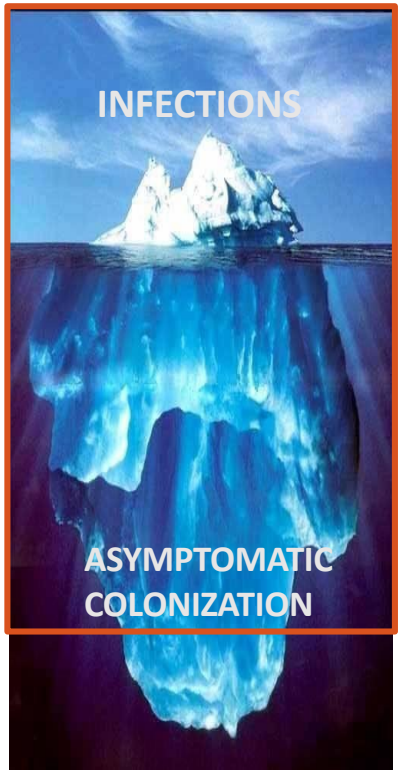
Characteristics of Novel and Targeted MDROs in Healthcare

Resistance



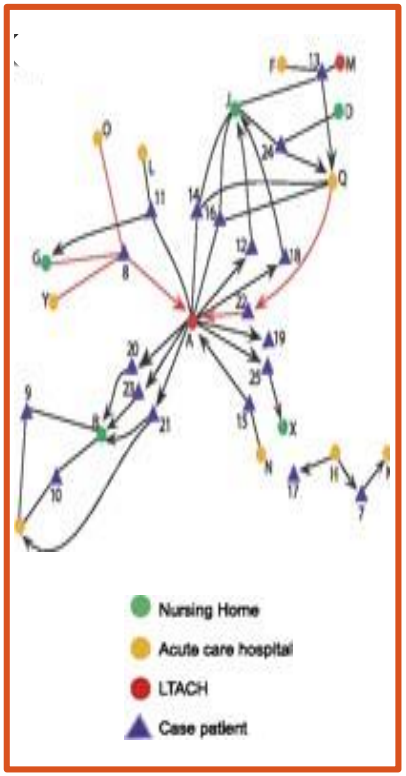


Detection



Transmission

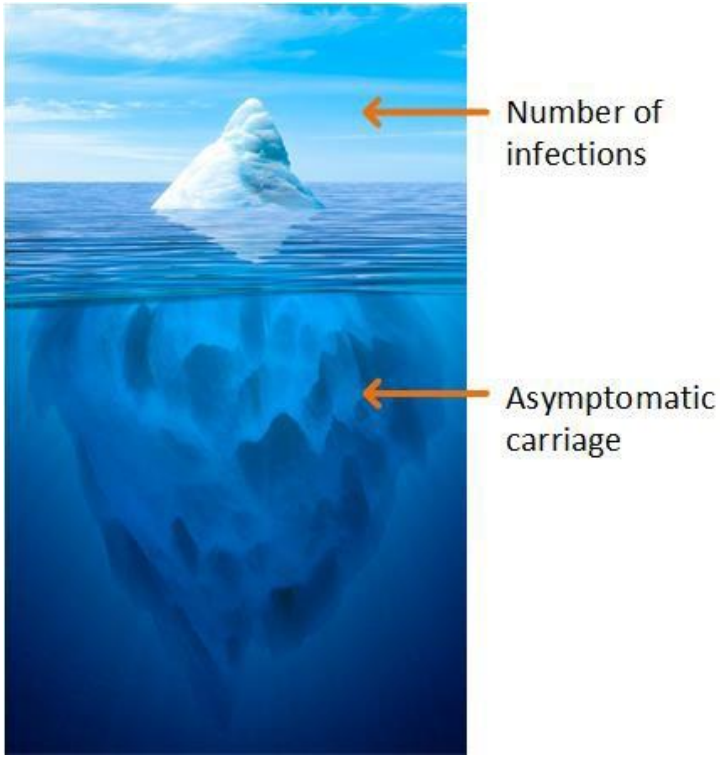
Spread



https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Challenges with Detection of MDROs

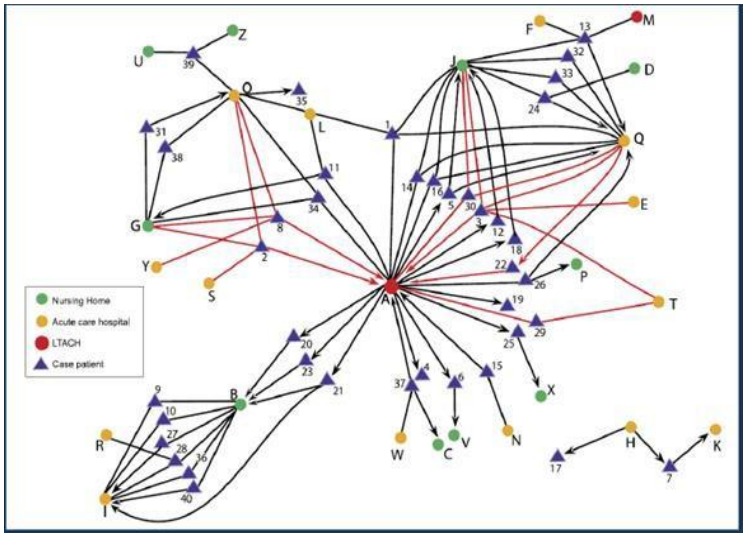
- Clinical cultures underestimate true prevalence of MDROs
- Most centers are not performing active surveillance to identify asymptomatic, colonized residents
  - ***Contribute to the reservoir for transmission***
- Inadequate communication about individual MDRO history or risk factors between healthcare facilities during care transitions



https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Healthcare Networks Drive MDRO Spread

- Patient movements amplify the regional burden of MDROs, especially in centers with:
  - Longer length of stay
  - Increasing acuity of care
  - Decreased staff: patient ratios
  - Gaps in infection prevention practices



Won SY et al. Clin Infect Dis. 2011;53(6):532-540.
https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Containment Strategy

Systematic public health response to slow the spread of emerging AR

Often responding to a single case

Onsite assessment using standardized tools

Available through ARLN

Regular infection control assessments and screening (point prevalence surveys) until transmission stops

ARLABnetwork

https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

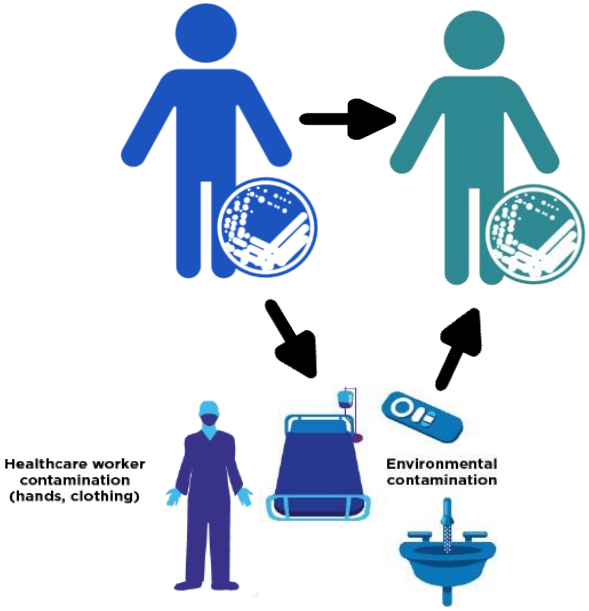
Enhanced Barrier Precautions (EBP)

MDROs Have Significant Impact in Nursing Homes

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

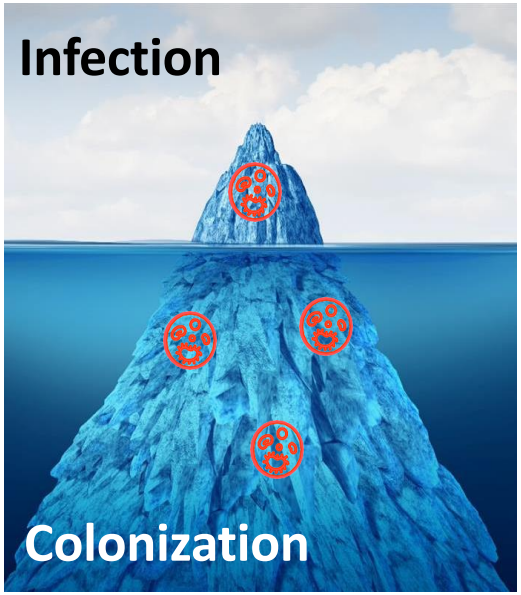
https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/PPE.html#cdc_generic_section_6-resources

Colonization Drives MDRO Spread and Precedes Infection



Shedding of MDROs from colonized individuals leads to contamination of HCP hands and clothing and the surrounding healthcare environment

Colonization confers a 2-10-fold higher risk of infection with the colonizing organism



For every individual identified with an MDRO infection, there are many more who are colonized

https://www.michigan.gov/mdhhs/-/media/Project/Websites/mdhhs/HAI-SHARP/Webinars/Presentation---EBP-41124.pdf?rev=3d521d43cb594fb9b73de981c9dd03b9&hash=C5E4A9E572304D72225302DB84A3FF33

The Large Burden of MDROs in Nursing Homes

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

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

Risk Factors for MDROs in Nursing Homes

Indwelling devices

Tracheostomy tubes

Urinary catheters

PEG tubes

Central lines

Wounds

Chronic

Antibiotic use

Recent healthcare exposures

Acute care

Long-term care

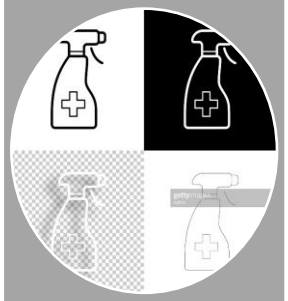
Comorbid conditions

Functional dependence

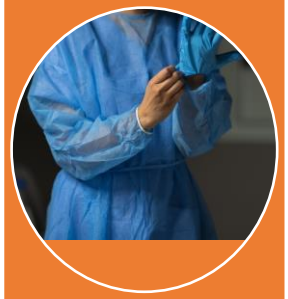
https://www.michigan.gov/mdhhs/-/media/Project/Websites/mdhhs/HAI-SHARP/Webinars/Presentation---EBP-41124.pdf?rev=3d521d43cb594fb9b73de981c9dd03b9&hash=C5E4A9E572304D72225302DB84A3FF33

MDRO Prevention Strategy in Nursing Homes

Hand Hygiene



Environmental Cleaning and Disinfection



Enhanced Barrier Precautions

PPE Use

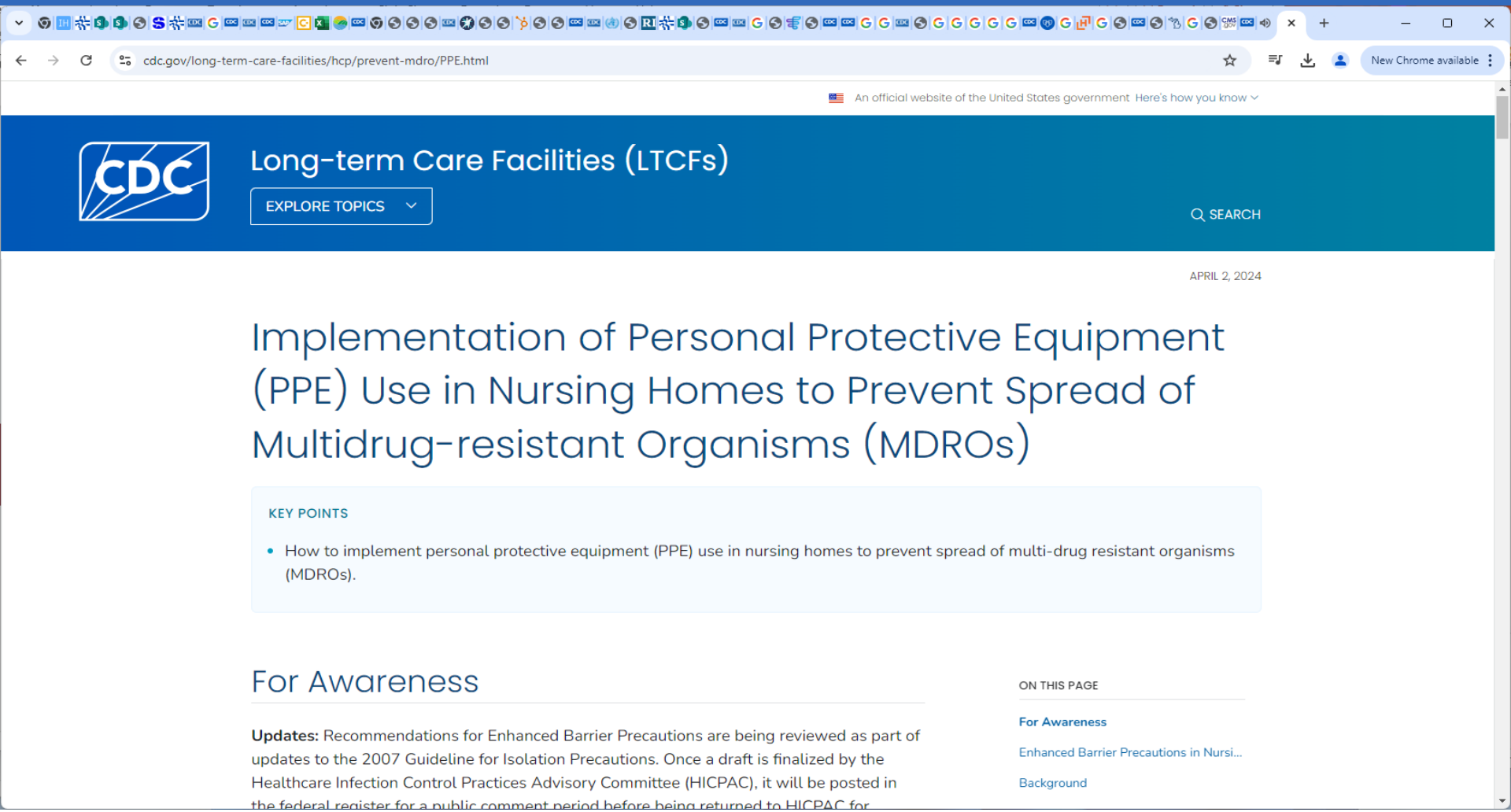
Auditing & Feedback

Training and Education

Communication

https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/PPE.html#cdc_generic_section_6-resources

Enhanced Barrier Precautions: Guidance for Nursing Homes to Prevent MDRO Spread



https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/PPE.html

Need for Enhanced Barrier Precautions (EBP)

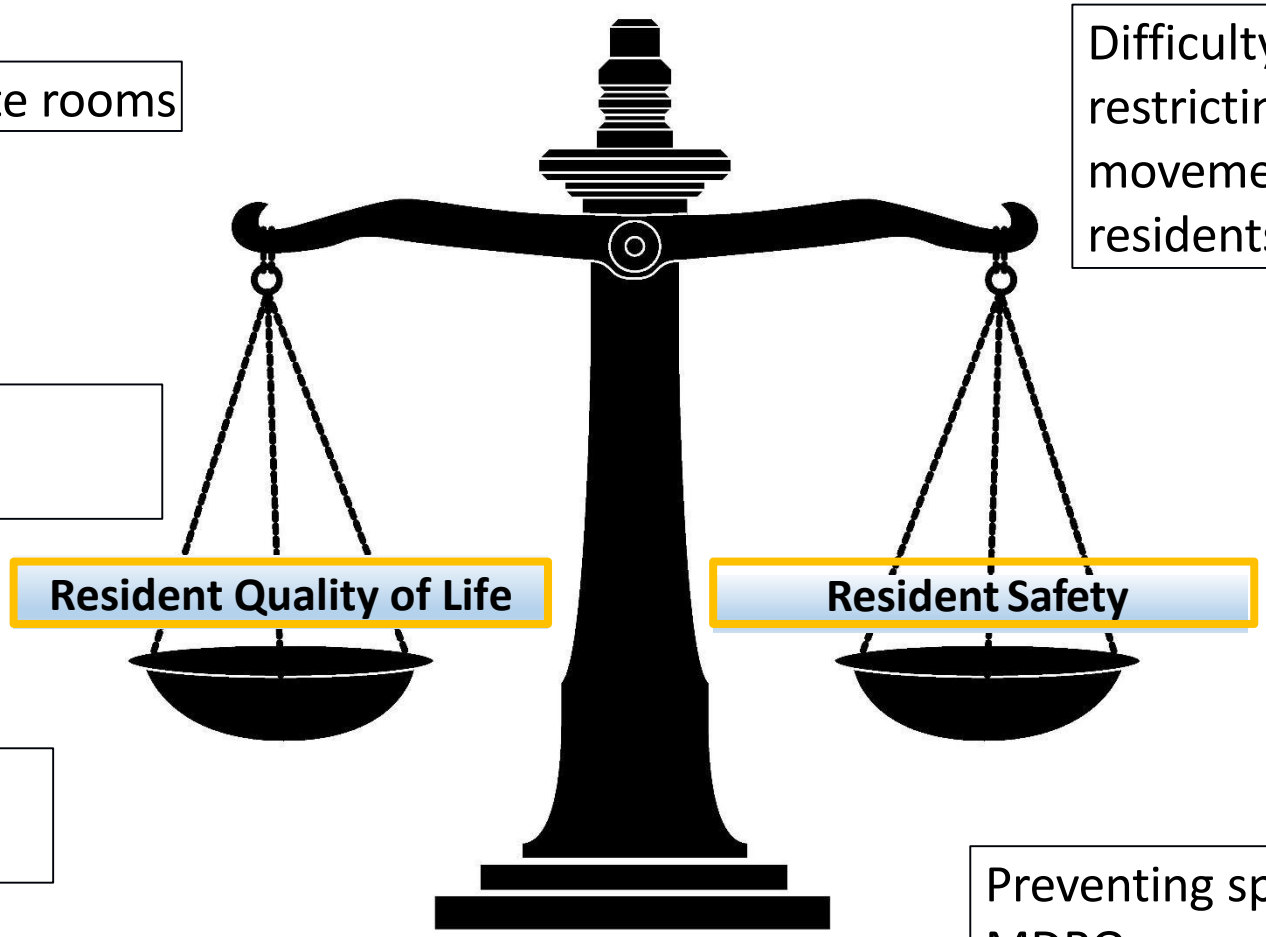
- Historically, interventions in nursing homes have focused only on residents who are actively infected with an MDRO
- Need for a broader approach to reduce the spread of MDROs without isolating residents for long periods of time
- Recent studies have indicated the use of EBP can effectively reduce the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

https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/PPE.html#cdc_generic_section_6-resources

Quality of Life vs. Resident Safety

Lack of Private rooms

Difficulty in restricting movement/moving residents



"Home-like" environment

Psychosocial well-being

Minimize stigmatization

Preventing spread of MDROs

https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Enhanced Barrier Precautions (EBP)

- Risk-based approach to PPE use to reduce the spread of MDROs
- Use of gown and gloves during high-contact resident care activities for specific residents
- Expands the use of PPE beyond situations where blood and body fluid exposure is anticipated

Enhanced Barrier Precautions

- Use of gown and gloves during high-contact resident care activities
- Private room is **not** required
- Residents **can** participate in group activities
- Resident is **not restricted** to room
- Intended to be used for resident's entire length of stay
- For implementation in nursing homes only

High-contact Resident Care Activities

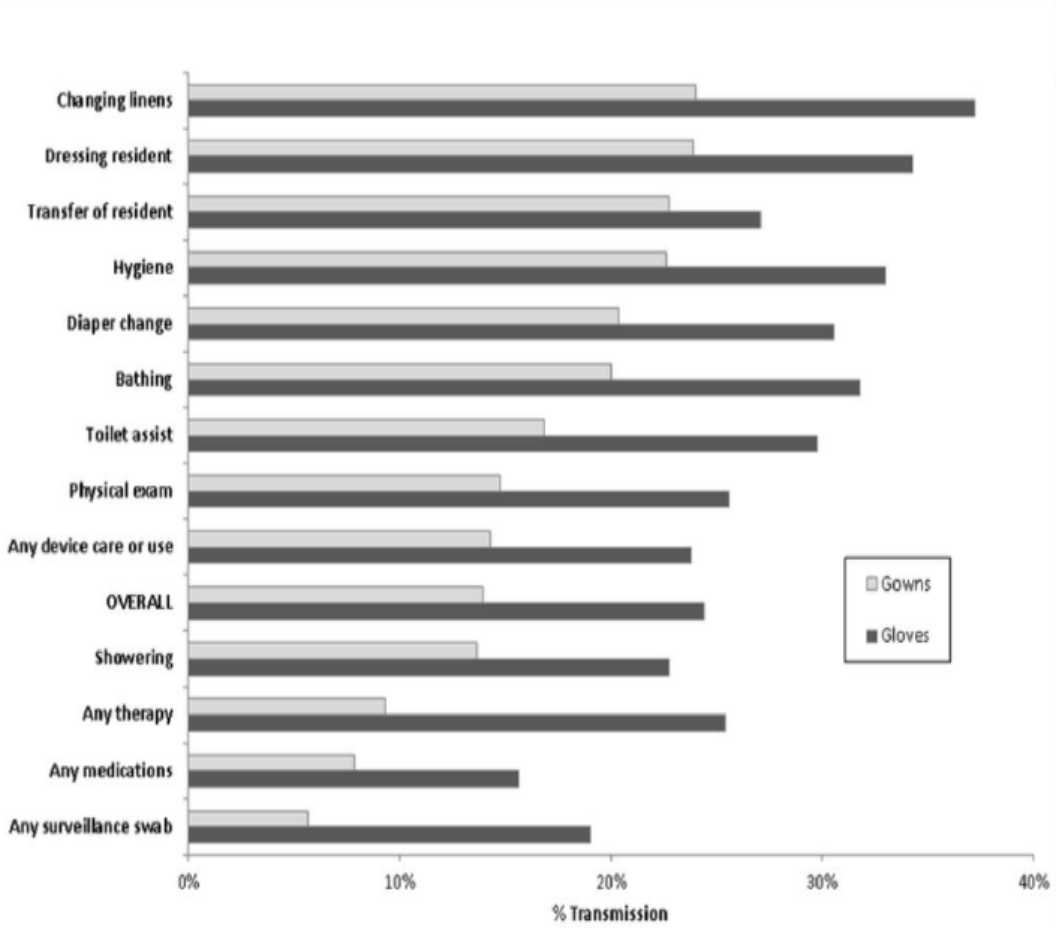
EBP is indicated during these activities

- Dressing
- Bathing/showering
- Transferring
- Providing hygiene
- Changing linens

- Changing briefs or assisting with toileting
- Device care or use of a device: central line, urinary catheter, feeding tube, tracheostomy/ventilator
- Wound care: any skin opening requiring a dressing

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

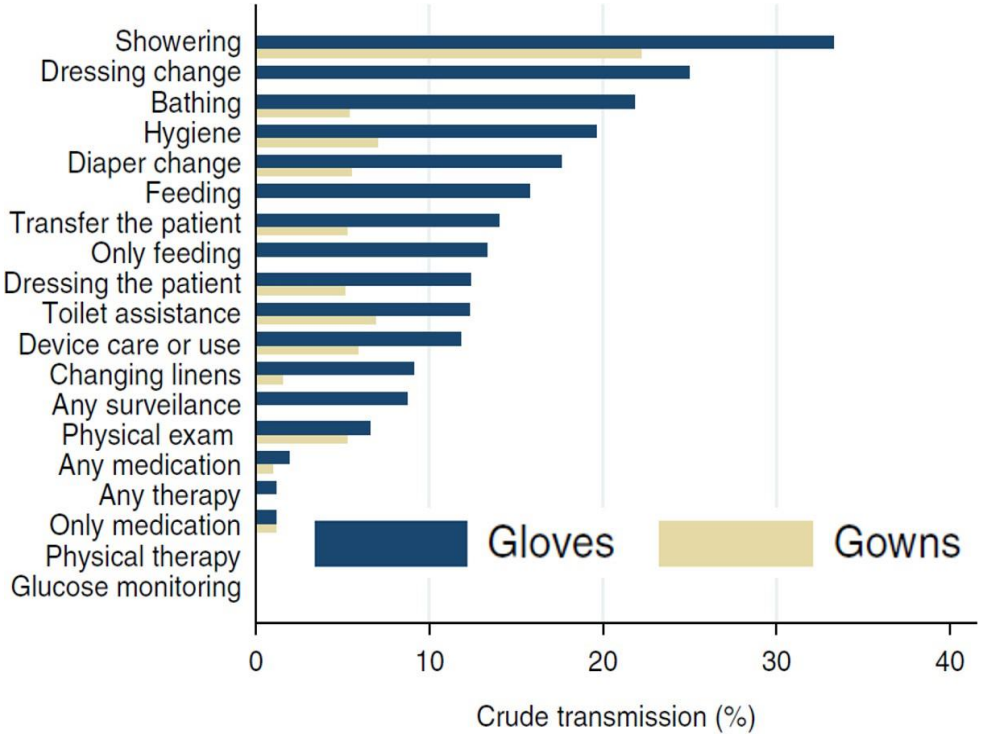


Roghmann et al. Infect Control Hosp Epidemiol. 2015 September; 36(9): 1050-1057

Resistant Gram-negative Bacteria (RGNB)

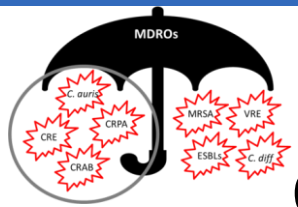
Transmission of RGNB to Gowns and Gloves of HCW during Care of Colonized Residents

- **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

Which MDROs are EBP Indicated For



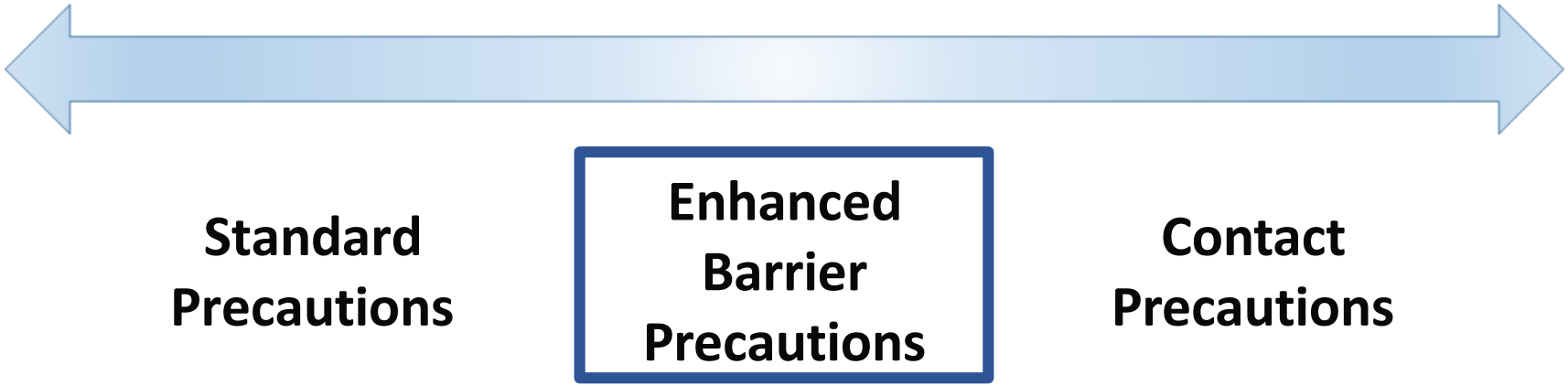
Targeted MDROs

- Pan-resistant organisms
- Carbapenemase-producing organisms (CPOs)
  - Enterobacterales
  - *Pseudomonas* spp.
  - *Acinetobacter* spp.
- *Candida auris*

Other Epidemiologically Important MDROs

- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- ESBL-producing Enterobacterales (ESBL)
- Vancomycin-resistant Enterococci (VRE)
- Multidrug-resistant *Pseudomonas aeruginosa*
- Drug-resistant *Streptococcus pneumoniae*

Personal Protective Equipment (PPE) & Precautions



https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Standard Precautions

Precautions	Applies to:	PPE used for these situations:	Required PPE
Standard Precautions	***All residents***	***Any potential exposure to:*** ▪ Blood ▪ Body fluids ▪ Mucous membranes ▪ Non-intact skin ▪ Potentially contaminated environmental surfaces or equipment	Depending on anticipated exposure: gloves, gown, or face protection (PPE always changed and hand hygiene performed before care of another resident)

https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Indications and Application of Enhanced Barrier Precautions vs. Contact Precautions

Enhanced Barrier Precautions

Applies to:

All residents with any of the following:

- Infection or colonization with a novel or targeted MDRO ***when Contact Precautions do not apply*.**
- Wounds and/or indwelling medical devices (e.g., central line, urinary catheter, feeding tube, tracheostomy/ventilator) regardless of MDRO colonization status

Facilities may consider applying Enhanced Barrier Precautions to residents infected or colonized with other epidemiologically-important MDROs based on facility policy.

Contact Precautions

Applies to:

All residents infected or colonized with a novel or targeted multidrug-resistant in specific situations:

- Presence of acute diarrhea, draining wounds or other sites of secretions or excretions that are unable to be covered or contained
- On units or in facilities where ongoing transmission is documented or suspected

For infections (e.g., C. difficile, norovirus, scabies) and other conditions where Contact Precautions is recommended

See Appendix A – Type and Duration of Precautions Recommended for Selected Infections and Conditions of the CDC Guideline for Isolation Precautions

https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Type of PPE Use in Enhanced Barrier Precautions vs. Contact Precautions

Enhanced Barrier Precautions	Contact Precautions
PPE used for these situations:	**PPE used for these situations:**
During high-contact resident 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: any skin opening requiring a dressing	**Any room entry**

https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Required PPE for Enhanced Barrier Precautions vs. Contact Precautions

Enhanced Barrier Precautions	Contact Precautions
Applies to:	**Applies to:**
Gloves and gown prior to the high-contact care activity	**Gloves and gown to enter the room**
Note: • ***Does <u>not</u> require single-room*** • ***Does <u>not</u> require restrictions of movement/participation within facility policy.***	***Note:*** • ***Includes consideration for single room or cohorting*** • ***Includes restriction of movement and participation in group activities within the facility***

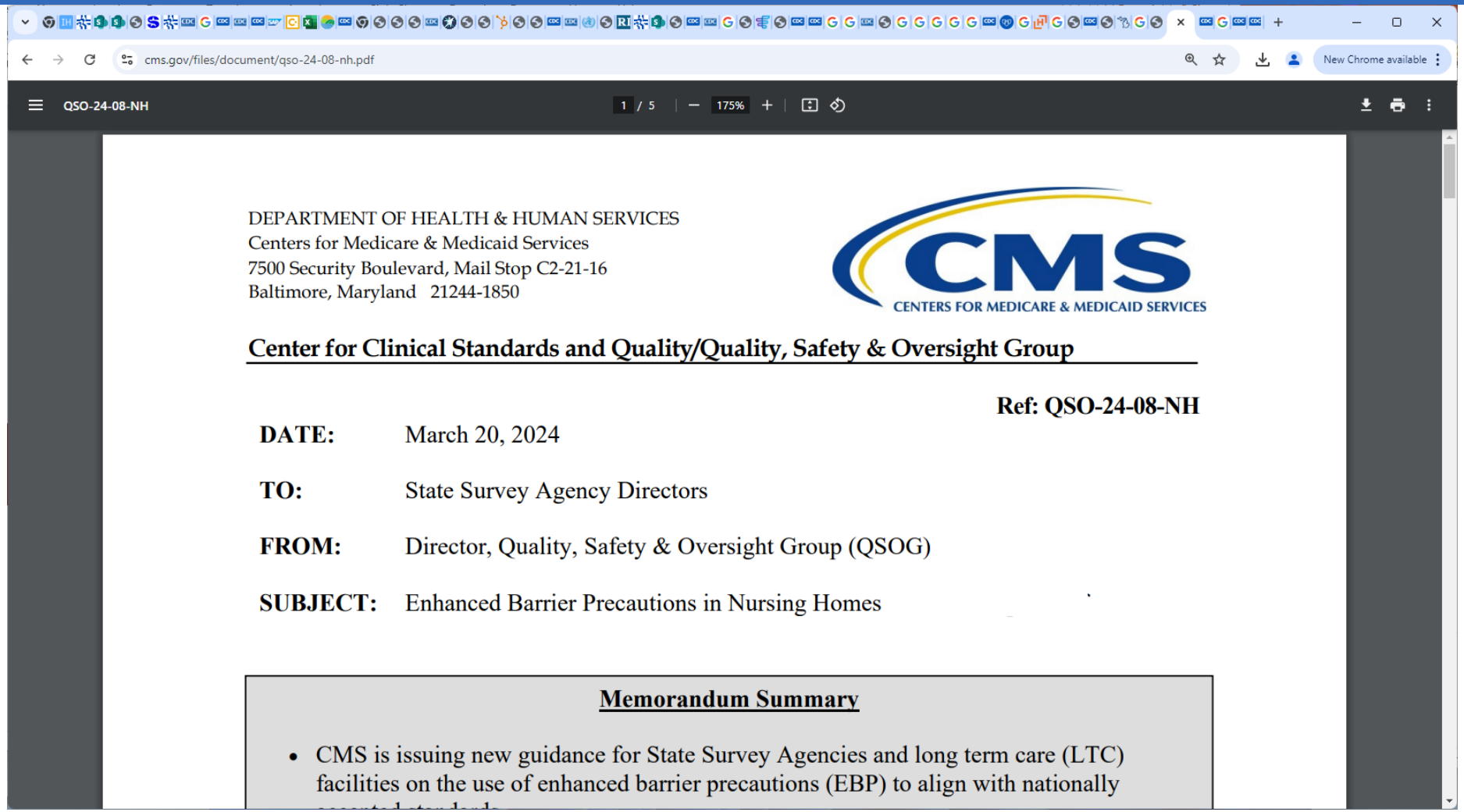
https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Summary of PPE Use and Room Restriction

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: • 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 *any of the following*: • Infection or colonization with an MDRO *when Contact Precautions do not otherwise apply* • Wounds and/or indwelling medical devices (e.g., central line, urinary catheter, feeding tube, tracheostomy/ventilator) *regardless of MDRO colonization status*	During high-contact resident 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: 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 *in any of the following situations*: • 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., *C. difficile*, 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

CMS Regulation and EBP in LTCF



cms.gov/files/document/qso-24-08-nh.pdf

QSO-24-08-NH 1 / 5 175%

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Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop C2-21-16
Baltimore, Maryland 21244-1850

CENTERS FOR MEDICARE & MEDICAID SERVICES

Center for Clinical Standards and Quality/Quality, Safety & Oversight Group

Ref: QSO-24-08-NH

DATE: March 20, 2024

TO: State Survey Agency Directors

FROM: Director, Quality, Safety & Oversight Group (QSOG)

SUBJECT: Enhanced Barrier Precautions in Nursing Homes

Memorandum Summary

- CMS is issuing new guidance for State Survey Agencies and long term care (LTC) facilities on the use of enhanced barrier precautions (EBP) to align with nationally

https://www.cms.gov/files/document/qso-24-08-nh.pdf

CMS Regulation – EBP vs CP

cms.gov/files/document/qso-24-08-nh.pdf

QSO-24-08-NH 3 / 5 125%

Table 1: Implementing Contact versus Enhanced Barrier Precautions

This table only applies to MDROs, not all pathogens that may require use of transmission-based precautions.

Resident Status	Contact Precautions	Use EBP
Infected or colonized with any MDRO and has secretions or excretions that are unable to be covered or contained.	Yes	No
Infected or colonized with a CDC-targeted MDRO **without** a wound, indwelling medical device or secretions or excretions that are unable to be covered or contained.	No	Yes
Infected or colonized with a non-CDC targeted MDRO **without** a wound, indwelling medical device, or secretions or excretions that are unable to be covered or contained.	No	At the discretion of the facility
Has a wound or indwelling medical device, **and** secretions or excretions that are unable to be covered or contained and are not known to be infected or colonized with any MDRO.	Yes, unless/until a specific organism is identified.	Yes, if they do not meet the criteria for contact precautions.
Has a wound or indwelling medical device, **without** secretions or excretions that are unable to be covered or contained and are not known to be infected or colonized with any MDRO.	No	Yes

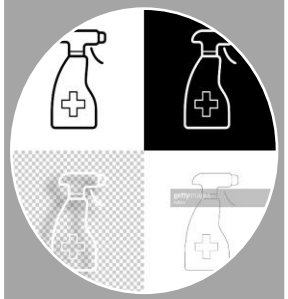
Examples of secretions or excretions include wound drainage, fecal incontinence or diarrhea, or other discharges from the body that cannot be contained and pose an increased potential for extensive environmental contamination and risk of transmission of a pathogen.

Facilities have discretion in using EBP for residents who do not have a chronic wound or indwelling medical device and are infected or colonized with **an MDRO that is not currently targeted by CDC.**

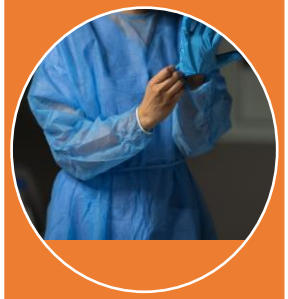
https://www.cms.gov/files/document/qso-24-08-nh.pdf

How to Be Successful

Hand Hygiene



Environmental Cleaning and Disinfection



Enhanced Barrier Precautions

PPE Use

Auditing & Feedback

Training and Education

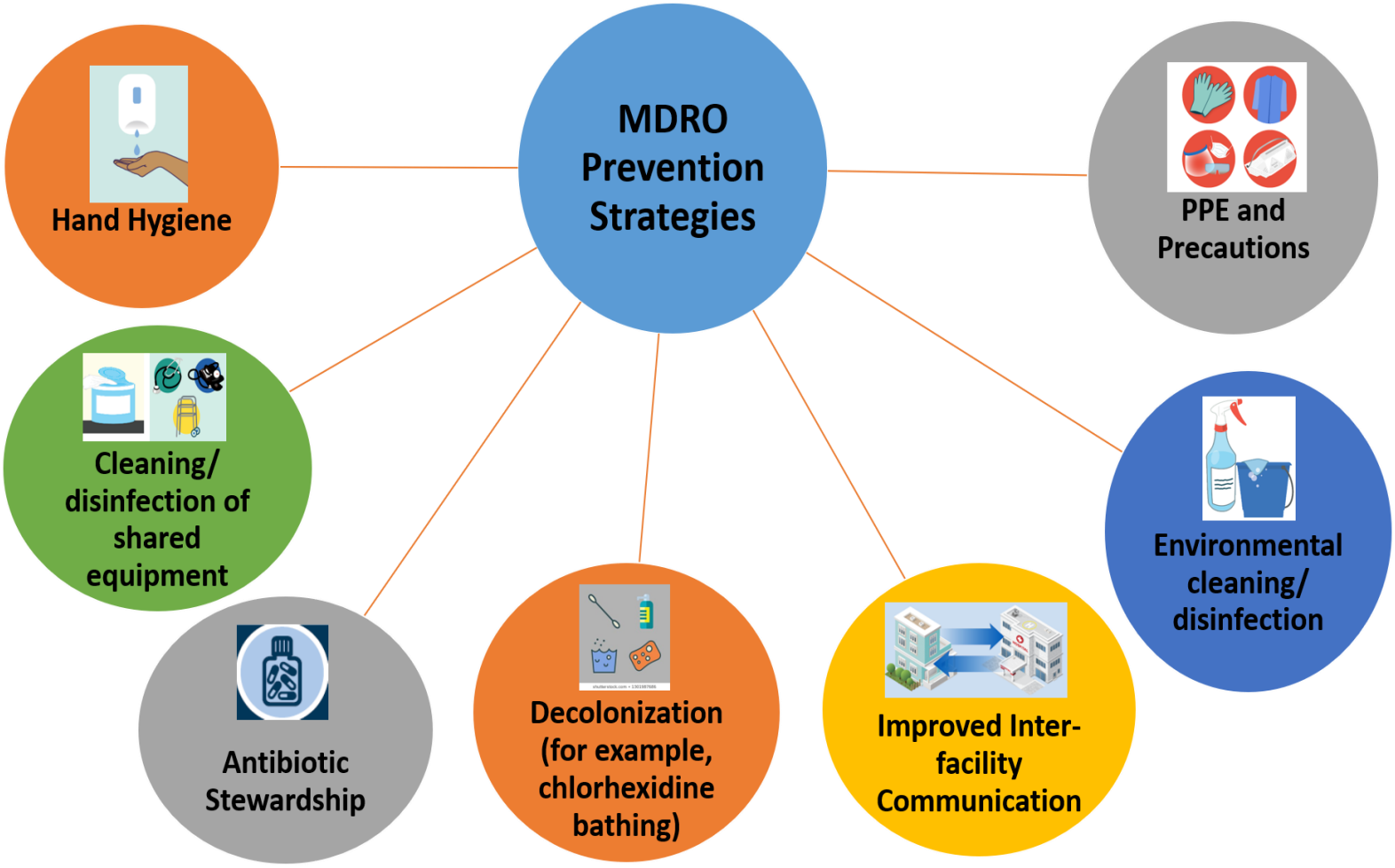
Communication

https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/PPE.html#cdc_generic_section_6-resources

Implementing Contact Precautions or Enhanced Barrier Precautions

- Post clear signage outside of the resident room indicating the type of Precautions and required PPE
  - For Enhanced Barrier Precautions, signage should clearly indicate the high-contact resident care activities
- Make PPE including gowns and gloves available immediately outside of resident room
- Ensure access to alcohol-based hand rub in every resident room (ideally both inside and outside of room)
- Position a trash can inside resident room and near exit for discarding PPE
- Incorporate periodic monitoring and assessment of adherence to determine need for additional training and education

MDRO Prevention: Novel and Core Strategies



https://emergency.cdc.gov/coca/ppt/Enhanced-Barrier-Precautions-for-MDRO-Final.pdf

Applying Enhanced Barrier Precautions

Scenario #1

- 78 y.o. female with no known history of an MDRO is admitted from the hospital with a G-tube
- They have no wounds or other indwelling devices
- **Question**
- Is there an indication for contact precautions?
- Is there an indication for enhanced barrier precautions?
- How long should they remain on precautions?

Scenario #2

- 82 y.o. male who is a long-term resident in a nursing home has a history of *Klebsiella pneumoniae* with KPC gene mechanism (CPO) in his urine. He has been on EBP.
- The resident develops an acute onset of diarrhea.

- **Question**
- Should he remain on EBP or be upgraded to contact precautions?
- For how long should either type of precaution remain in place?

Scenario #3

- The infection preventionist in a nursing home is implementing EBP. They are assessing all residents on unit A to determine who may need to be placed on EBP.
- The following residents are identified as potentially needing EBP.
  - Resident A has an indwelling urinary catheter in place
  - Resident B has a diabetic foot ulcer that requires twice daily dressing changes with drainage contained within the dressing
  - Resident C has two skin tears that are covered with 2x2 dressings
  - Resident D had a non-healing surgical wound that is now closed with history of colonization with a CPO in their urine
- **Question**
- **Which residents are EBP indicated for?**
- Resident A only
- Resident A, B, C
- Residents A, B, D
- They all require EBP

Resources

- Multiple resources including EBP signage, Presentations, Videos, family/staff/resident letters and more available at https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/PPE.html#cdc_generic_section_6-resources
- Frequently Asked Questions (FAQs) about Enhanced Barrier Precautions in Nursing Homes https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/faqs.html?CDC_AAref_Val=https://www.cdc.gov/hai/containment/faqs.html
- Implementation of PPE Use in Nursing Homes to Prevent the Spread of MDROs https://www.cdc.gov/long-term-care-facilities/hcp/prevent-mdro/PPE.html
- Table Summary of PPE Use and Room Restriction When Caring for Residents in Nursing Homes https://www.cdc.gov/long-term-care-facilities/media/pdfs/PPE-Nursing-Homes-Table-508.pdf
- Type and Duration of Precautions Appendix A https://www.cdc.gov/infection-control/hcp/isolation-precautions/appendix-a-type-duration.html

Thank you and Questions

- APIC NE for inviting me to speak

Patricia McAuley, MSN, RN, CIC
Consultant Public Health Nurse
HAI Coordinator
Rhode Island Department of Health
Center for Acute Infectious Disease Epidemiology (CAIDE)
Patricia.mcauley@health.ri.gov