

2017

Multidrug-Resistant Organisms (MDROs) Toolkit

For Long Term Care &
Assisted Living Facilities

NC Surveillance for Healthcare Associated and
Resistant Pathogens Patient Safety (SHARPPS)
Program



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Long Term Care & Assisted Living Facilities

What are MDROs?

Multidrug resistant organisms (MDROs) are bacteria that have become resistant to multiple types of antibiotics. Antimicrobial resistance is a major threat to public health. It is estimated that approximately 2 million people in the United States get infections that are resistant to antibiotics every year – and at least 23,000 people die as a result.

What causes MDROs?

Inappropriate use of antibiotics is a primary cause of antimicrobial resistance. Upper respiratory tract infections and bronchitis are usually caused by viruses. Despite this, approximately 50% of upper respiratory tract infections and 80% of acute bronchitis are inappropriately treated with antibiotics. This has contributed to the rise in antibiotic-resistant bacteria.

What types of infections do MDROs cause?

MDROs can cause infection in any part of the body. Common locations for infections may include: bloodstream, lungs, skin, surgical site, urinary tract, and wounds.

How are MDROs spread?

MDROs may spread from person to person by healthcare workers' hands. They can also be spread on objects, such as bed rails, medication cart handles, bedside tables, IV tubes, and catheters. MDROs can also be spread from person to person through direct contact. Some people may carry a MDRO (colonization) and not become ill; however, they can still spread the bacteria to others.

How to prevent MDROs

Proper hand hygiene is the best way to prevent the spread of MDROs. If receiving care as an inpatient of a healthcare facility, isolation precautions are also necessary.

Healthcare workers should wash their hands with soap and water or an alcohol-based hand rub before and after caring for a resident. Isolation precautions include wearing a gown and gloves before entering the room of a resident with a MDRO and cleaning and disinfecting resident rooms and medical equipment.

Developing an antibiotic stewardship program within the facility is another way to prevent the spread of MDROs. Antibiotic stewardship is a set of commitments and actions designed to optimize the treatment of infections while reducing the adverse events associated with antibiotic use. This includes improving antibiotic prescribing and reducing inappropriate use. To develop an antibiotic stewardship program, long term care facilities can use resources from the [Core Elements of Antibiotic Stewardship for Nursing Homes](#) from the Centers for Disease Control and Prevention (CDC) (Appendix A).

MDRO Definition and Isolation Precaution Guidance

Type of MDRO	Definition	Precautions
Carbapenem-Resistant Enterobacteriaceae (CRE)	Enterobacteriaceae are a family of bacteria that normally live in the human gut. CRE are Enterobacteriaceae that have developed resistance to last-resort antibiotics called carbapenems.	Contact
<i>Clostridium difficile</i>	<i>Clostridium difficile</i> is a type of bacteria that can cause an inflammation of the colon (colitis). Diarrhea and fever are the most common symptoms.	Contact *Use soap and water to clean hands. Alcohol-based hand sanitizer is not effective against <i>Clostridium difficile</i>
Extended Spectrum Beta-Lactamase Producers (ESBLs)	Extended-spectrum beta-lactamase is an enzyme (chemical tool) that allows bacteria to become resistant to a wide variety of penicillins and cephalosporins.	Contact
Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) is a type of <i>Staphylococcus</i> bacterium that is resistant to several antibiotics. MRSA causes a range of illnesses, from skin and wound infections to pneumonia and bloodstream infections that can cause sepsis and death.	Contact

Multi-drug resistant <i>Acinetobacter</i>	A drug-resistant <i>Acinetobacter</i> is a gram-negative bacterium that can cause pneumonia, bloodstream or wound infections. <i>Acinetobacter</i> may also be present in a tracheostomy site or wound and not cause an infection.	Contact
Vancomycin-Resistant Enterococci (VRE)	Enterococci are bacteria that are normally present in the human gut and can sometimes cause infections. When enterococci become resistant to vancomycin, they are called vancomycin-resistant enterococci (VRE).	Contact

Take reasonable precautions to limit opportunities for transmission

Unlike acute care hospitals, it is not expected or reasonable for residents to be confined to their room for an extended period of time. Decisions about participation in social activities and other activities in common areas need to balance the risk of transmission with the potential adverse psychological impact of non-participation. In general, colonized or infected residents may use common areas if their secretions/excretions can be controlled. To reduce opportunities for transmission, facilities should consider the “5 C’s”:

- **Continent:** Is the resident continent, or is the incontinence able to be contained?
- **Contained:** Are the resident’s wounds contained (clean, dry dressing)?
- **Cognizant:** Is the resident cognizant?
- **Compliant:** Is the resident compliant with recommendations to prevent transmission (such as hand hygiene)?
- **Clean:** Is the resident clean (bathed, with clean clothing)?

Additional guidance is included in “Management of Multidrug-Resistant Organisms In Healthcare Settings, 2006” by Healthcare Infection Control Practices Advisory Committee in Appendix E.

What are Standard Precautions?

Standard Precautions are the basic level of infection control precautions that should be used, at a minimum, in the care of all residents. Hand hygiene is a primary component of Standard Precautions and is considered one of the most effective methods to prevent transmission of disease, including MDROs. The use of personal protective equipment (PPE) should be guided by risk assessment and the extent of contact anticipated with blood and body fluids, or pathogens. Additional guidance for Standard Precautions is located in Appendix B.

What are Contact Precautions?

Contact Precautions should be used for residents with a MDRO in healthcare settings, including long term care and assisted living facilities. Contact precautions are implemented in addition to standard precautions, the basic level of infection control use in resident care. Adhering to contact precautions prevents the transmission of MDROs to other residents and healthcare workers.

What is required in Contact Precautions?

Hand hygiene	Thoroughly wash hands with soap and water or an alcohol-based rub: <ul style="list-style-type: none">○ Before entering a resident's room○ Before putting on gloves and gown○ After removing gloves and gown○ After leaving a resident's room
Gloves	<ul style="list-style-type: none">○ Put on gloves before entering a resident's room○ Wear gloves when touching the resident and the resident's immediate environment or belongings (e.g. bed rail, toilet, clothing)○ Remove gloves promptly after use, before leaving the resident's room○ Discard used gloves before touching non-contaminated items or environmental surfaces○ Do not use gloves on more than 1 resident
Gowns	<ul style="list-style-type: none">○ Put on a gown before entering a resident's room

	<ul style="list-style-type: none"> ○ Remove gown before leaving a resident's room ○ Do not wear the same gown for care of multiple residents
Resident Placement	<ul style="list-style-type: none"> ○ Residents with confirmed or suspected MDRO colonization or infection should be placed in a private, single-person room. ○ When private rooms are not available or not feasible, residents with confirmed or suspected MDRO colonization or infection should be cohorted together or be placed with roommates at lowest risk for transmission. This includes residents who are continent of stool and urine, do not have wounds, are able to perform hand hygiene, and are generally more independent for activities of daily living.
Cleaning/Disinfection	<ul style="list-style-type: none"> ○ Frequently clean and disinfect the bathroom and high touch surfaces of the room such as the bed rails and table ○ Frequently clean and disinfect medical equipment that is used on multiple residents ○ Use disposable medical equipment or dedicate equipment that cannot be adequately cleaned and disinfected (e.g., cloth gait belts) to individual residents

When should residents be placed on Contact Precautions?

Residents should be placed on Contact Precautions when there is laboratory-confirmed evidence or suspicion of MDRO infection or colonization.

Note: Not all laboratory test results specifically confirm ESBL-positive specimens. Some laboratory results will show the degree to which a specimen is resistant to specific extended-spectrum third generation cephalosporins. If resistance to one or more extended-spectrum third generation cephalosporins is indicated on a laboratory result,

suspect ESBL is present and place the resident on preemptive contact precautions (Appendix D).

For additional questions, contact the NC Surveillance for Healthcare Associated and Resistant Pathogen Patient Safety (SHARPPS) program at nchai@dhhs.nc.gov, or the NC Communicable Disease Branch epidemiologist on call at 919-733-3419.

APPENDICES

Appendix A: CDC Core Elements of Antibiotic Stewardship for Nursing Homes

Summary of Core Elements for Antibiotic Stewardship in Nursing Homes

Leadership commitment
Demonstrate support and commitment to safe and appropriate antibiotic use in your facility

Accountability
Identify physician, nursing and pharmacy leads responsible for promoting and overseeing antibiotic stewardship activities in your facility

Drug expertise
Establish access to consultant pharmacists or other individuals with experience or training in antibiotic stewardship for your facility

Action
Implement **at least one** policy or practice to improve antibiotic use

Tracking
Monitor **at least one process** measure of antibiotic use and **at least one outcome** from antibiotic use in your facility

Reporting
Provide regular feedback on antibiotic use and resistance to prescribing clinicians, nursing staff and other relevant staff

Education
Provide resources to clinicians, nursing staff, residents and families about antibiotic resistance and opportunities for improving antibiotic use

<https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html>

Appendix B: Standard Precautions for the Care of All Patients in All Healthcare Settings

Taken from [2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings](#), CDC.

Component	Recommendations
Hand hygiene	After touching blood, body fluids, secretions, excretions, contaminated items; immediately after removing gloves; between patient contacts.
Personal protective equipment (PPE) Gloves	For touching blood, body fluids, secretions, excretions, contaminated items; for touching mucous membranes and non-intact skin
Personal protective equipment (PPE) Gown	During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated.
Personal protective equipment (PPE) Mask, eye protection (goggles), face shield	During procedures and patient-care activities likely to generate splashes or sprays of blood, body fluids, secretions, especially suctioning, endotracheal intubation. During aerosol-generating procedures on patients with suspected or proven infections transmitted by respiratory aerosols wear a fit-tested N95 or higher respirator in addition to gloves, gown and face/eye protection.
Soiled patient-care equipment	Handle in a manner that prevents transfer of microorganisms to others and to the environment; wear gloves if visibly contaminated; perform hand hygiene.
Environmental control	Develop procedures for routine care, cleaning, and disinfection of environmental surfaces, especially frequently touched surfaces in patient-care areas.
Textiles and laundry	Handle in a manner that prevents transfer of microorganisms to others and to the environment

Needles and other sharps	Do not recap, bend, break, or hand-manipulate used needles; if recapping is required, use a one-handed scoop technique only; use safety features when available; place used sharps in puncture-resistant container
Patient resuscitation	Use mouthpiece, resuscitation bag, other ventilation devices to prevent contact with mouth and oral secretions
Patient placement	Prioritize for single-patient room if patient is at increased risk of transmission, is likely to contaminate the environment, does not maintain appropriate hygiene, or is at increased risk of acquiring infection or developing adverse outcome following infection.
Respiratory hygiene/cough etiquette (source containment of infectious respiratory secretions in symptomatic patients, beginning at initial point of encounter e.g., triage and reception areas in emergency departments and physician offices)	Instruct symptomatic persons to cover mouth/nose when sneezing/coughing; use tissues and dispose in no-touch receptacle; observe hand hygiene after soiling of hands with respiratory secretions; wear surgical mask if tolerated or maintain spatial separation, >3 feet if possible.

Appendix C: Contact Precautions Poster

To display outside of resident rooms



The poster features a bright orange background. At the top, the word "CONTACT" is written in large, bold, black letters, and "PRECAUTIONS" is written below it in the same style. On either side of the text are red octagonal signs with white borders; the left one says "STOP" and the right one says "ALTO". Below the main title, a red italicized line reads "Visitors must report to Nursing Station before entering." Below this are four rows of instructions, each with a small black and white icon to the left of a checkmark in a square box. The icons represent hand hygiene, wearing gloves, wearing a gown, and using patient-dedicated or single-use equipment. At the bottom of the poster, the Spanish title "PRECAUCIONES DE CONTACTO" is written in bold black letters, followed by a red italicized line of Spanish text: "Los visitantes deben presentarse primero al puesto de enfermería antes de entrar. Lávese las manos. Póngase guantes al entrar al cuarto."

CONTACT PRECAUTIONS

Visitors must report to Nursing Station before entering.

-  Perform hand hygiene before entering and before leaving room.
-  Wear gloves when entering room or cubicle, and when touching patient's intact skin, surfaces, or articles in close proximity
-  Wear gown when entering room or cubicle and whenever anticipating that clothing will touch patient items or potentially contaminated environmental surfaces.
-  Use patient-dedicated or single-use disposable shared equipment or clean and disinfect shared equipment (BP cuff, thermometers) between patients.

PRECAUCIONES DE CONTACTO

Los visitantes deben presentarse primero al puesto de enfermería antes de entrar. Lávese las manos. Póngase guantes al entrar al cuarto.

<http://spice.unc.edu/wp-content/uploads/2016/12/ContactPrecautions1final.pdf>

Appendix D: List of Extended Spectrum Third and Fourth Generation Cephalosporins

Antibiotic	Trade Name
Cefepime	Maxipime (Bristol-Myers Squibb)
Cefixime	Suprax (Lederle)
Cefotaxime	Claforan (Hoechst-Roussel)
Cefpodoxime proxetil	Vantin (Pharmacia/Pfizer)
Ceftazidime	Fortaz & Ceptaz (Glaxo SK), Tazidime (Lilly), Tazicef (Glaxo SK)
Ceftibuten	Cedax (Schering Plough)
Ceftizoxime	Cefizox (Fujisawa)
Ceftriaxone	Rocephin (Roche)
Cefdinir	Omnicef
Cefditoren pivoxil	Spectracef (Vansen Pharma Inc)

Appendix E: Additional MDRO Resources

Additional MDRO Resources

- [2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings](#), CDC
- [CRE Long Term Care Facilities Toolkit](#), NC Division of Public Health
- [Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006](#), Healthcare Infection Control Practices Advisory Committee
- [MDRO Definitions](#), Oregon Department of Health
- [North Carolina Statewide Program for Infection Control and Epidemiology](#), NC SPICE

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