**Guidance for Control of Carbapenem Resistant *Enterobacteriaceae***

**(CRE)**

**Toolkit for Acute and Long-Term Care Settings**



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**Toolkit Overview**

The Massachusetts CRE Toolkit is designed to aid healthcare workers involved with carbapenem-resistant *Enterobacteriaceae* prevention, detection, and treatment across the continuum of healthcare. This group would include infectious disease physicians, epidemiologists, infection preventionists, directors of nursing in skilled nursing facilities, nurses, pharmacists and microbiologists.

Carbapenem-resistant *Enterobacteriaceae* (CRE) are an emerging threat to global health. The potential for rapid spread and the difficulties confronted when treating CRE infections make it critically important for public health to promote aggressive infection control measures.

As highlighted in the CDC Vital Signs, August 2015 issue titled, “Making health care safer: Stop spread of antibiotic resistance,” a coordinated, regional approach to prevent the spread of CRE is critical to reduce the impact of CRE on all of Massachusetts’ healthcare facilities. Inappropriate antibiotic use and lack of infection prevention safe-guards in one facility affect others because of patient and resident transfers and shared healthcare providers. (1)

Routine hand hygiene and ongoing monitoring of staff adherence to hand hygiene remains the single most important aspect of preventing CRE transmission and other multi-drug-resistant organisms (MDROs)! However, additional practices including appropriate antibiotic use, inter-facility communications, and contact precautions are needed.

The 2017 Massachusetts CRE Toolkit is adapted from the 2016 Oregon CRE Toolkit with Massachusetts-specific definitions and protocols. The original draft of this toolkit written by the Oregon Drug-Resistant Organism Prevention and Coordinated Regional Epidemiology (DROP-CRE) workgroup was modeled after CDC’s 2012 CRE Toolkit, which is available on the CDC website ([www.cdc.gov/hai/organisms/cre/cre-toolkit/](http://www.cdc.gov/hai/organisms/cre/cre-toolkit/)). (2)

*The creation of this toolkit was supported by funding from the Centers for Disease Control and Prevention (CDC) Epidemiology and Laboratory Capacity (ELC) Grant.*

### Surveillance

#### MDPH CRE Reporting Requirements

Report any of the following *Enterobacteriaceae* (isolated from any source)\*:

|  |
| --- |
| *Klebsiella pneumoniae* |
| *Klebsiella oxytoca* |
| *Enterobacter cloacae* |
| *Enterobacter aerogenes* |
| *Escherichia coli* |

With resistance to **one or more** of the following carbapenems:

* Imipenem (MIC >=4 µg/ml) -Doripenem (MIC >=4 µg/ml)
* Meropenem (MIC >=4 µg/ml)

OR, that demonstrate carbapenemase production (CP-CRE)

Ideally, reporting should be done automatically through electronic laboratory reporting to MDPH. Questions about reporting should be directed to 617-983-6801.

\*105 CMR 300.000 Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements. (Updated January 2017): <http://www.mass.gov/eohhs/docs/dph/cdc/reporting/rprtbldiseases-labs.pdf>

**Laboratory Testing**

MA SPHL CRE isolate submission requirements

The 105 CMR 300.000 Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements ([http://www.mass.gov/eohhs/docs/dph/cdc/reporting/rprtbldiseases-](http://www.mass.gov/eohhs/docs/dph/cdc/reporting/rprtbldiseases-labs.pdf)  [labs.pdf](http://www.mass.gov/eohhs/docs/dph/cdc/reporting/rprtbldiseases-labs.pdf)) were updated in January 2017 to include a requirement that select CRE isolates are to be forwarded to the Massachusetts State Public Health Laboratory (MA SPHL) for additional characterization purposes.

All CRE with the following profile are to be sent to the MA SPHL:

*1.* ***Klebsiella pneumoniae; Klebsiella oxytoca; Escherichia coli; Enterobacter aerogenes****; and* ***Enterobacter cloacae*** (isolated from any source) with resistance to **one or more** of the following carbapenems**:** imipenem; meropenem; and/or doripenem (at MIC >=4 mcg/ml). *Note: ertapenem resistance alone is not a criterion for isolate submission.*

1. OR, any of the above five organisms demonstrating carbapenemase production, by phenotypic screening using the mCIM- Modified Carbapenem Inactivation Method; or Carba-NP; or by mechanism-specific testing by PCR detection of the following gene targets: KPC; NDM; OXA; VIM; IMP; or MCR.
2. Submit the first isolate of carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) each month.
3. We will **not** be accepting carbapenem-resistant *Acinetobacter baumanii* (CRAB) isolates.

Isolates are to be submitted to the MA SPHL Clinical Microbiology Lab using the general requisition form ([http://www.mass.gov/eohhs/docs/dph/laboratory-sciences/general-](http://www.mass.gov/eohhs/docs/dph/laboratory-sciences/general-submission-form.pdf)  [submission-form.pdf](http://www.mass.gov/eohhs/docs/dph/laboratory-sciences/general-submission-form.pdf)). Please include all susceptibility results generated at your lab.

Please send **only one isolate per patient per admission**.

#### CLSI breakpoints for antibiotic susceptibility testing (AST)

**Table: CLSI breakpoints, 2015** (3)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Current MIC breakpoints (µg/mL)** | | |
|  | **MIC interpretation1** | | |
| Carbapenems | Susceptible | Intermediate | Resistant |
| Doripenem | ≤1 | 2 | ≥4 |
| Ertapenem | ≤0.5 | 1 | ≥2 |
| Imipenem | ≤1 | 2 | ≥4 |
| Meropenem | ≤1 | 2 | ≥4 |
|  | **Current disk diffusion zone diameters (mm)** | | |
|  | **Interpretation** | | |
| Carbapenems | Susceptible | Intermediate | Resistant |
| Doripenem | ≥23 | 20-22 | ≤19 |
| Ertapenem | ≥22 | 19-21 | ≤18 |
| Imipenem | ≥23 | 20-22 | ≤19 |
| Meropenem ≥23 20-22 ≤19 | | | |

1

Laboratories still using breakpoints before the June 2010 CLSI update should use the updated CLSI

MIC cutoffs to determine reporting to public health, independent of the susceptibility interpretation (e. g., an isolate with an MIC of 8 to meropenem [“intermediate” by pre-2010 CLSI interpretation, but “resistant” by CLSI guidelines starting in 2011] should still be reported to MDPH and submitted for further evaluation).

Many, if not most, ertapenem mono-resistant *Enterobacteriaceae* do not actually rule-in as CRE.



#### Carbapenemase testing

We believe the CRE resistance mechanism should guide the prevention and control response for the reasons cited below. Microbiology laboratory susceptibility testing does not reliably differentiate resistance mechanisms. As a result, the MA SPHL has implemented a rapid method for testing CRE isolates (see above: MA SPHL CRE isolate submission criteria from clinical laboratories).

###### Carbapenemase-producing CRE (CP-CRE)

CP-CRE are primarily responsible for the rapid worldwide spread of CRE**. Potential for rapid spread, treatment difficulties, and poor outcomes make it critically important to maintain aggressive infection control measures.** Resistance among CP-CRE is conferred by enzymes that directly break apart the carbapenem ring, inactivating the antibiotic.

When these carbapenemase enzymes are located on plasmids, this can facilitate transmission in and among bacterial species, and contribute to rapid dissemination. Plasmid mediated carbapenemases are a reason for the rapid worldwide spread of CP-CRE. (4, 5) Carbapenemases of global importance include *Klebsiella pneumoniae* carbapenemase (KPC), New Delhi metallo-β-lactamase (NDM), Verona integron encoded metallo-β-lactamase (VIM), imipenemase metallo-β-lactamase (IMP), and oxacillinase-48 (OXA-48). **KPC has been the most widespread carbapenemase in the United States. (6)**

We define CP-CRE as *Enterobacteriaceae* that can be shown to produce enzymes that inactivate carbapenems or that are nucleic acid amplification testing (NAAT)-positive for carbapenemase genes (e.g., KPC, NDM, VIM, IMP, OXA-48).

* *Serratia marcescens* may produce a chromosomally-encoded carbapenemase called the *S. marcescens* enzyme (SME). Because it is located on the chromosome and not on a plasmid, it appears to have a limited potential for rapid spread.

###### Detection methods for CP-CRE

* + **Carba NP Test:** A rapid, accurate technique for carbapenemase detection. (7-9) The test identifies the hydrolysis of the β-lactam ring of a carbapenem. A buffered suspension of the organism is combined with a solution of imipenem and phenol red; a positive test is defined as a color change from red to yellow witha change inpH.
  + **Modified Carbapenem Inactivation Method (mCIM)**: A test in which a paper disk with a particular concentration of meropenem is exposed to a suspension of the organism for a definite period of time, and then used to test a standard, meropenem-susceptible organism for meropenem susceptibility. If there is no zone of inhibition, then the meropenem has been inactivated.
* **Nucleic acid amplification testing (NAAT):** NAAT is typically performed on pure colonies of a bacteria obtained by culture, which involves growing, isolating and identifying an organism from clinical samples. NAAT testing for resistance markers directly from positive blood culture bottles is also possible. Examples of NAAT include PCR and transcription-mediated amplification (TMA).

**NAAT: Isolated colonies. Testing CRE isolates for the presence of a carbapenemase gene is the most accurate way to detect CP-CRE**. While carbapenemase PCR testing of bacterial isolates is currently not performed by most clinical labs, the *MA SPHL has the capacity to perform PCR testing for the most commonly encountered global carbapenemases including KPC, NDM, VIM, IMP and OXA-48.*

**NAAT: Positive blood cultures.**

Several molecular platforms are FDA-cleared for identifying organisms and detecting antibiotic resistance markers, including carbapenemases directly from positive blood culture bottles.

Example platforms include the FilmArray® Blood Culture Identification (BCID) Panel (BioFire, Salt Lake City, UT) and the Verigene® Gram-Negative Blood Culture Test (Nanosphere, Northbrood, IL). (10, 11)

### Infection Prevention and Control in:

**Acute care hospitals (ACHs) and long-term acute care hospitals (LTACHs)**

In summary, act “**NICE**” to prevent the spread of CRE:

**Notify** MDPH and pertinent clinician groups when any CRE are identified. Additionally, for carbapenemase-producing CRE (CP-CRE), notify hospital administration.

**Intervene** on all cases with core infection prevention and control strategies, including hand hygiene, contact precautions, private rooms and optimized environmental cleaning. Reduce unnecessary antibiotics and invasive devices.

Additionally, for CP-CRE:

* + Cohort patients – monitor adherence to hand hygiene, contact precautions;
  + Conduct thorough environmental cleaning and;
  + Screen high-risk patient contacts.

**Communicate** CRE infection or colonization status to the receiving facility upon patient transfer.

**Educate** patients, staff, and visitors about CRE.

Part 1: General CRE prevention measures for ACHs and LTACHs

* 1. **Ensure adequate processes to facilitate *rapid* notification of clinical and infection prevention and control staff** when CRE are identified in the microbiology laboratory.
  2. **“Flag” the patient’s chart for Multidrug-Resistant Organisms** and notify the receiving facility at patient transfer, if applicable.
  3. **Educate the staff about CRE.** Consider giving an in-service to staff about CRE and other MDROs. Sample CRE educational materials are attached as appendices.
  4. **Review microbiology laboratory records** for the past 12 months to identify any previously unrecognized CRE cases in consultation with laboratory personnel. Report any new cases discovered to MDPH.
  5. **Consider implementing active surveillance cultures** for patients who are at high- risk for CRE colonization upon hospital admission.

Given the current epidemiology of CP-CRE, one suggested approach is to screen newly admitted patients who have been hospitalized overnight internationally within the past six months with rectal or peri-rectal swab cultures. For basic assistance on determining global, national and local CP-CRE epidemiology, we recommend the following links:

* + 1. [www.cdc.gov/hai/organisms/cre/TrackingCRE.html](http://www.cdc.gov/hai/organisms/cre/TrackingCRE.html)
    2. [wwwnc.cdc.gov/eid/ article/17/10/pdfs/ 11-0655.pdf](http://wwwnc.cdc.gov/eid/article/17/10/pdfs/11-0655.pdf)
    3. [www.ncbi.nlm.nih.gov/pubmed/24930781](http://www.ncbi.nlm.nih.gov/pubmed/24930781)
    4. Massachusetts state antibiogram data: [http://www.mass.gov/eohhs/gov/departments/dph/programs/id/epi](http://www.mass.gov/eohhs/gov/departments/dph/programs/id/epidemiology/providers/mrsa/statewide-antibiogram-data.html)  [demiology/providers/mrsa/statewide-antibiogram-data.html](http://www.mass.gov/eohhs/gov/departments/dph/programs/id/epidemiology/providers/mrsa/statewide-antibiogram-data.html)

Part 2: What to do when CRE are identified at your ACH or LTACH

###### Initial recommendations before carbapenemase testing

1. **Notify MDPH** of a patient isolate meeting the CRE case definition. Report any new cases or known cases transferred from out-of-state. Laboratories are required to report isolates.
2. **Upon patient transfer to another healthcare facility, notify the receiving facility the patient has CRE in a readily available written manner in addition to verbal communication.** An example transfer form is provided in the appendix. Be sure the individuals directly caring for the patient and those responsible for infection prevention at the receiving facility are aware of the patient’s CRE status.
3. **Place CRE-infected and CRE-colonized patients on contact precautions. Empower staff to monitor and enforce contact precautions.**

Continue contact precautions for duration of hospitalization.

“Flag” the chart of a CRE-positive patient so they can be identified and placed on contact precautions immediately if re-admitted.

1. **Place CRE-infected and CRE- colonized patients in private rooms.** If the number of single patient rooms is limited, prioritize single rooms for CRE-positive patients with higher transmission risk such as draining wound or stool incontinence. Cohort CRE-positive patients if private rooms are unavailable.
2. **Educate staff, affected patients and their visitors about CRE.** Education helps to reduce the spread of CRE.
3. **Reinforce the importance of adherence to core infection prevention measures of hand hygiene, contact precautions and environmental cleaning through periodic audits and observation.** Consider monitoring adherence to all core MDRO prevention measures.
4. **Notify pertinent clinician groups (infectious diseases, critical care, pharmacy, antibiotic stewardship program [ASP], etc.)** of CRE in the facility.

**Consider initiating a formal ASP if your facility does not have one already.** See CDC website [www.cdc.gov/getsmart/](http://www.cdc.gov/getsmart/) healthcare/inpatient-stewardship.html.

1. **Directly interface with clinicians caring for the CRE-infected or CRE-colonized patient.**

Encourage limiting antibiotics and invasive devices.

###### Recommendations after results of carbapenemase testing:

**For non-CP-CRE: continue contact precautions. Per recent CDC guidance; no additional measures arerequired.**(2,15)

**For CP-CRE: implement the following additional measures:**

1. **Notify MDPH in addition to receiving facility upon patient transfer.**
2. **Notify hospital administration.**

Prevention of spread needs to be an institutional priority, which requires leadership and resource support.

1. **Review microbiology records** to identify any other CP-CRE cases at the facility within the past 12 months. Review of microbiology records can detect outbreaks of CRE, such as those reported in association with contaminated medical equipment.(16)
2. **Educate staff, patients and visitors about CP-CRE.**
3. **Monitor adherence to hand hygiene and contact precautions for the room(s) of CP-CRE- positive patients.**

Strongly consider a hand-hygiene campaign on affected units. Review with and evaluate staff on use of contact precautions.

1. **Alert housekeeping and monitor environmental cleaning.** Encourage frequent

thorough cleaning of high-touch surfaces, particularly those near the patient, and common areas outside the room. Evaluate terminal cleaning using visual inspection plus quantitative strategies, such as UV fluorescence marker or adenosine triphosphate

(ATP) monitor before placing another patient in that room. If available, supplement manual cleaning with UV light, hydrogen peroxide vapor or another “no touch” modality. See the CDC environmental cleaning monitoring tool in the appendix.

1. **Verify and audit decontamination, disinfection, reprocessing, and sterilization (when needed) of reusable medical equipment used by CP-CRE patients.**
2. **In consultation with MDPH, obtain CP-CRE screening cultures for high-risk health care facility contacts.** Expand the screening pool if initial testing reveals additional cases. Considerations for contacts at highest risk include factors related to duration and intensity of exposure to the case patient including:
   1. Proximity to case patient;
   2. Shared nurses, physicians, and other health care providers;
   3. The intensity of nursing required;
   4. Stool and urine incontinence;
   5. Shared medical equipment or procedures; and
   6. Length of stay.

For example, it is important to screen roommates, even if already discharged. Other local factors may be considered; each situation is unique, and the final approach will be based on discussions between MDPH and the hospital.

**Pertinent screening culture details include:**

Specimens for screening cultures may be obtained by anyone who is qualified (see appendix).

The recommended screening sites are either rectal or perirectal swabs. Enhanced sensitivity may be achieved by screening both wounds and urine, if catheters are in place. The cost- benefit ratio of screening additional sites is uncertain and therefore not routinely recommended.

Generally, screening cultures should not be billed to the patient; discuss billing with the microbiology laboratory and facility leadership.

Keep a record of screening culture results and “flag” any CRE-colonized patient for appropriate infection control.

1. **Cohort nursing staff that care for CP-CRE-positive patients as resources allow.** This is most important and more feasible in the situation of ≥2 CP-CRE-positive patients. Cohorted nursing to ratios as low as 1:1 has been key to preventing further transmission in several outbreaks.
2. **In the event >1 case is detected, cohort patients to one hospital ward when technically feasible.** Private rooms for each patient are still recommended.
3. **In the event of a cluster of cases, consider active surveillance cultures.** Unlike screening cultures for high-risk contacts, which is routinely recommended with CP-CRE cases, this approach is the systematic screening of a predefined patient population, such as all ICU admissions.(17) Typically, surveillance cultures are performed on admission and periodically for affected wards or areas. Surveillance cultures are another strategy successfully used as part of an intervention bundle to control outbreaks.(18,19)



### Infection Prevention and Control in:

**Skilled Nursing Facilities (SNFs) and**

**Rehabilitation Facilities**

In summary, act “**NICE**” to prevent the spread of CRE:

**Notify** MDPH and pertinent clinician groups when any type of CRE are identified. Additionally, for carbapenemase-producing CRE (CP- CRE), notify facility administration.

**Intervene** on all cases with improved facility-wide hand hygiene and environmental cleaning, while reducing unnecessary antibiotics and use of invasive devices. Place residents with CP-CRE in private rooms, if available, and use contact precautions for in-room care.

**Communicate** CRE infection or colonization status to the receiving facility upon patient transfer.

**Educate** patients, staff, and visitors about CRE.

#### Part 1: General CRE prevention measures for SNFs

1. **Ensure adequate processes are in place for rapid notification of pertinent staff** when CRE and other MDROs are identified on facility transfer or by the microbiology laboratory. This should include requesting the laboratory to call and notify the facility when CRE are identified.
2. **Ensure routine adherence to handhygiene:**

Before touching a resident, even if gloves will be worn;

Before exiting the resident’s care area after touching the resident or the resident’s immediate environment;

After contact with blood, body fluids or excretions, or wound dressings;

Before performing an aseptic task such as capillary blood glucose (CBG) testing or giving a subcutaneous injection (must wear gloves);

If hands move from contaminated body sites to clean body sites during resident care; and after glove removal.

1. **Ensure sufficient and appropriate contact precaution PPE (gloves and gowns) is available and readily accessible, and care-givers understand and are trained on when and how to use it.**
2. **Upon patient transfer to another healthcare facility, notify the receiving facility the patient has CRE in a readily available written manner in addition to verbal communication.** An example transfer form is provided in the appendix. Be sure the individuals directly caring for the patient and those responsible for infection prevention at the receiving facility are aware of the patient’s CRE status.
3. **Educate staff about CRE.** Consider giving an in-service to staff about CRE and other MDROs. Sample CRE educational materials are attached as appendices.
4. **Review general infection prevention and control policies and ensure appropriate training, competencies and audits are in place.** Examples of important basic issues are standard precautions, including hand hygiene, contact precautions, linen reprocessing and environmental cleaning. For environmental cleaning, ensure housekeeping is properly using an EPA-registered disinfectant labeled for use in health care.
5. **Familiarize your staff with infection criteria and surveillance definitions in long term care settings.(20)**

Part 2: What to do when CRE is identified at your SNF

1. **Promote hand hygiene and monitor staff adherence to hand hygiene: this is the single most important aspect of preventing CRE transmission!** A long-term care facility hand hygiene observation tool developed by the Oregon Patient Safety Commission (OPSC) can be found in the appendix or the OPSC website at [http://oregonpatientsafety.org](http://oregonpatientsafety.org/).
2. **Notify MDPH** within one business day of identification of a patient isolate meeting the CRE case definition. Report any new cases or known cases transferred from out-of-state.
3. **Consult public health about developing the appropriate infection prevention plan for the resident, including the need for contact precautions,** based on the resident’s clinical status and other medical and social needs. Refer to “When and how to apply contact precautions to residents”below.
4. **Upon resident transfer to another health care facility, inform the receiving facility, in writing, that the resident has CRE.** An example transfer form is provided as an appendix. Be sure people

directly caring for the patient and responsible for infection prevention are aware the resident has CRE.

1. **Review the importance of meticulous environmental cleaning with the housekeepers.** This includes at a minimum, daily room and bathroom cleaning and attention to “high-touch” surfaces such as light switches, door knobs and bathroom handrails. Two long-term care facility environmental cleaning checklists, one for resident rooms and one for common areas, can be found in the appendix or the OPSC website at [http://oregonpatient-safety.org](http://oregonpatientsafety.org/).
2. **If a CRE-infected or CRE-colonized resident is discharged home, ensure they are aware of their CRE colonization and notify the resident’s primary care provider of the diagnosis.** This will potentially help the individual during future medical treatment and assist public health in tracking CRE on subsequent facility admissions.
3. **Educate staff, affected residents and their visitors about CRE.** Education helps to reduce the spread of CRE.
4. **Notify appropriate clinicians (medical director, director of nursing, pharmacist, etc.) of CRE in the facility. Specific goals:**

Limit use of catheters, tubes and other invasive devices in all residents.

Stop unnecessary antibiotic use in all residents, especially those who are CRE-positive.

Review monthly antibiotic use, and culture orders and susceptibility patterns to evaluate appropriate antibiotic use and identify if unnecessary antibiotics and cultures were ordered.

Contact MDPH for information on antimicrobial stewardship programs in long-term care facilities.

**Additional recommendations based on the results of carbapenemase testing:**

**For non-CP-CRE: no additional measures are required.** Refer to the section titled “When and how to apply contact precautions for CRE-positive residents in SNFs” for a discussion of how to determine whether contact precautions should be used.

**For CP-CRE, implement the following additional measures:**

1. **Notify MDPH, in addition to the receiving facility, upon resident transfer.**
2. **Notify facility administration.** Prevention of spread needs to be an institutional priority, which requires leadership and monetary support.
3. **Review your facility’s microbiology records** within the past 12 months to identify any other suspect CP-CRE cases and work with your laboratory to assure that appropriate testing for CP-CRE

detection will take place.

1. **Educate staff, affected residents and their visitors about CP-CRE.**
2. **Monitor facility-wide hand hygiene adherence, particularly for the room(s) of CP-CRE-positive residents.** Use the case as an opportunity to initiate a facility-wide hand hygiene campaign.
3. **We strongly encourage private single bed rooms for all residents infected or colonized with CP- CRE.** This will decrease the chance of CP-CRE transmission within the facility. Note: this recommendation is separate from and does not mean “isolation,” which would typically be reserved for residents with active CRE infection with high transmission risk due to their inability to contain their body fluids or wound drainage. Isolation is considered an adjunct method to contact precautions focused on decreasing transmission from an actively ill person to others. See below for details.
4. **If feasible, when >1 CP-CRE case is identified at the facility, cohort the residents by housing them in same wing, even if they are in single-bed rooms.**
5. **Alert housekeeping and monitor adequacy of environmental cleaning.** Encourage frequent, thorough cleaning of high-touch surfaces in and outside the room. Use the long-term care facility environmental cleaning checklists, one for resident rooms and one for common areas provided in the appendix. Determine and fix any gaps in the adequacy of room cleaning on discharge or transfer before placing another resident in the room. If available, use additional strategies to check cleaning adequacy, such as UV fluorescence markers or ATP monitors.
6. **Verify and audit decontamination, disinfection, reprocessing, and sterilization (when needed) of reusable medical equipment used by CP-CRE residents.**
7. **In consultation with MDPH (available 24/7 at 617-983-6800), obtain CRE screening cultures for high-risk resident-contacts.** Expand the screening group if initial testing reveals additional cases. Considerations for contacts at highest risk include factors related to duration and intensity of exposure to the known CRE-positive resident, including the following:
   1. Proximity to CRE-positive resident;
   2. Shared health care providers;
   3. Intensity of nursing required;
   4. Stool or urine incontinence;
   5. Shared medical equipment or procedures; and
   6. Length of stay.

For example, it is important to screen roommates, even if already discharged. Other local factors should be considered; each situation is unique, and the final approach will be based on discussions between public health and the facility.

**Pertinent screening culture details include:**

See the microbiology laboratory section for the recommended screening protocol. MDPH is available for consultation and assistance throughout the process.

If MRSA, VRE or other MDRO screening is performed in your facility, a similar consent process may be used for CP-CRE screening. Either verbal or written consent, depending on your facility’s policies and procedures, could be appropriate. See the appendix for a sample consent form.

Specimens for screening cultures may be obtained by anyone who is qualified (see appendix).

The recommended screening sites are either rectal or perirectal swabs. Enhanced sensitivity may be achieved by screening both wounds and urine, if catheters are in place. The cost-benefit ratio of screening additional sites is uncertain and therefore not routinely recommended. Generally, screening cultures should not be billed to the resident.

Keep a record of screening culture results and “flag” any CRE-colonized residents for appropriate infection control. The decision whether to enter or withhold results of screening tests as microbiology laboratory reports in the clinical chart should be made at the facility level.

1. **Cohort staff that care for CP-CRE- positive residents as resources allow.** In long-term care, this generally means assigning the same group of caregivers to the resident instead of assigning caregivers who may float to other wards or wings of the facility.
2. **In the event of an outbreak, consult with MDPH regarding the need for supplemental measures including active surveillancecultures.**

**When and how to apply contact precautions**\* **for CRE-positive residents in SNFs**

\*Contact precautions are a part of transmission-based precautions, where the type of personal protective equipment (PPE) is chosen to fit the clinical situation. For example, contact precautions involve using gown and gloves when administering care to a resident or contacting their room environment. Droplet precautions means using a facemask and faceshield to prevent contact with respiratory droplets. “Precautions” DO NOT mean “isolation.” Isolation is a selective adjunct to transmission-based precautions when additional separation of an ill person is necessary to prevent transmission of the infectious agent. For example, a person with active symptoms of Influenza or norovirus infection should be isolated in their room until symptoms resolve, and caregivers must use certain transmission-based precautions when administering care.

**For whom:**

* **CP-CRE-infected or colonized residents;**
* **Residents infected with non- CP-CRE or other target MDROs; and**
* **Residents colonized with non- CP-CRE or other target MDROs who are at higher-risk for transmission.**

**How to apply:** Staff must use gowns and gloves for all in-room resident care.

**Important details:**

1. **Room restriction:** CRE-positive residents should not be discouraged from participating in daily community meals and activities outside of their room, provided their source of CRE is covered and contained.
2. **Do not forget hand hygiene** is KEY to preventing CRE transmission, and the appropriate use of in- room care contact precautions provides an additional measure of protection. Staff should be reminded to perform hand hygiene before donning and after doffing gloves and gowns.
3. **Standard precautions should be employed for all residents. (21)** This includes the use of gowns and gloves for anticipated contact with body fluid or potential splashes and when changing soiled bed linens. Refer to the “Standard precautions” section in the “Ambulatory care” section of the CRE toolkit for additional information.

**Working definition of residents at “ higher-risk for transmission” based on CDC guidance (21):**

* + Ventilator-dependent;
  + Uncontained incontinence of stool;
  + Uncontained incontinence of urine; and/or
  + Wounds with difficult to control drainage.

Consult MDPH for individualized case recommendations when the need for contact precautions is uncertain.

**When can contact precautions for residents with CP-CRE be discontinued?**

Discontinue contact precautions when the resident has at least three negative screening cultures per the following algorithm:

* Three negative screening cultures that are:

At least three months after the last positive culture; AND At least three months after last course of antibiotics; AND Each culture obtained ≥1 week apart.

* The recommended screening sites are either rectal or perirectal swabs. If the original site of infection is still present such as a wound that hasn’t healed or urine from a chronically catheterized patient, at least one culture from such sites should be added to the screening from the GI tract.

###### Summary of recommendations for management of SNF residents with CRE

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Measure** | **CP-CRE**  **infection** | **CP-CRE**  **colonization** | **Non-CP-CRE**  **infection** | **Non-CP-CRE**  **colonization††** |
| Notify receiving facility\* | **Yes** | **Yes** | **Yes** | **Yes** |
| Notify MDPH upon transfer or death | **Yes** | **Yes** | **No** | **No** |
| Standard precautions | **Yes** | **Yes** | **Yes** | **Yes** |
| Contact precautions† Gown/gloves for in-room resident care | **Yes** | **Yes** | **Yes** | For residents at higher risk of CRE transmission |
| Door signage | **Yes** | **Yes** | **Yes** | For residents at higher risk of CRE transmission |
| Private room | **Yes (strongly encouraged)** | **Yes (strongly encouraged)** | **Yes** | **No** |
| Restricted to room | **Yes** | **No\*\*** | **No\*\*** | **No\*\*** |
| Enhanced environmental cleaning | **Yes** | **Yes** | **Yes** | **No** |
| Designated or disposable equipment | **Yes** | **Yes** | **Yes** | **No** |
| If >1 case, cohort staff if feasible | **Yes** | **Yes** | **Optional** | **Optional** |
| If >1 case, cohort residents if feasible | **Yes** | **Yes** | **Optional** | **Optional** |
| Consult with MDPH regarding screening cultures | **Yes** | **Yes** | **No** | **No** |
| **Visitor recommendations:** | | | | |
| * Perform hand hygiene often, particularly after leaving the resident’s room. | **Yes** | **Yes** | **Yes** | **Yes** |
| * Gown/gloves if contact with body fluids is anticipated. | **Yes** | **Yes** | **Yes** | **Yes** |
| * Gown/gloves ifnocontact with body fluids is anticipated. | **No** | **No** | **No** | **No** |

\*Report MDRO on transfer communication form for one year following the most recent positive CRE test.

†Contact precautions means using a gown and gloves for any in-room resident care. Residents colonized with non-CP-CRE require contact precautions if they are at higher risk for CRE transmission (see text).

\*\*Restricted to room. Residents should be restricted to their rooms if they are not able to contain their secretions and excretions. Residents for whom secretions and excretions can be contained may leave their rooms. Upon leaving their rooms, all residents should be clean, fluids contained, able to follow instructions with assistance and should wash their hands.

††Colonization with CRE means the organism is present on the body but is not causing symptoms of disease. Colonizing CRE can go on to cause infections of various body sites such as blood, urinary tract, or lungs. (Source: Centers for Disease Control and Prevention. Carbapenem-resistant Enterobacteriaceae (CRE) Infection: Clinician FAQs. [http://www.cdc.gov/hai/organisms/cre/cre-](http://www.cdc.gov/hai/organisms/cre/cre-clinicianFAQ.html)  [clinicianFAQ.html;](http://www.cdc.gov/hai/organisms/cre/cre-clinicianFAQ.html) accessed Nov 17, 2015)

### Infection Prevention and Control in:

**Ambulatory care, outpatient clinics, hemodialysis centers, ambulatory surgery centers, home health, hospice**

###### We recommend employing standard precautions.

Refer to the 2011 CDC booklet titled the **“Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care,”** available here: [http://www.cdc.gov/](http://www.cdc.gov/HAI/settings/outpatient/outpatient-care-guidelines.html)  [HAI/settings/outpatient/outpatient-care-guidelines.html](http://www.cdc.gov/HAI/settings/outpatient/outpatient-care-guidelines.html).(22) The most pertinent infection prevention and control measures for preventing the transmission of CRE, MDROs, norovirus and many other infections in ambulatory care setting are **adherence to hand hygiene and proper use of personal protective equipment (PPE).** Key recommendations for each item in the document are copied below.

###### Key recommendations for hand hygiene in ambulatory care settings:

1. **Key situations where hand hygiene should be performed include:**
   * Before touching a patient, even if gloves will be worn;
   * Before exiting the patient’s care area after touching the patient or the patient’s immediate environment;
   * After contact with blood, body fluids or excretions, or wound dressings;
   * Before performing an aseptic task such as placing an IV, preparing an injection;
   * If hands move from contaminated body sites to clean-body sites in patient care; and after glove removal.
2. **The preferred method of hand decontamination is with an alcohol-based hand rub.**

**Exception:** use soap and water when hands are visibly soiled or after caring for patients with known or suspected infectious diarrhea such as *Clostridium difficile* or norovirus, or after using the restroom.

###### Key recommendations for use of PPE in ambulatory care settings:

1. **Facilities should ensure sufficient and appropriate PPE is available and readily accessible.**
2. **Educate all health care providers on proper selection and use of PPE.**
3. **Remove and discard PPE before leaving the patient’s room or area; and**
4. **Wear gloves for potential contact with blood, body fluids, mucous membranes, non-intact skin or contaminated equipment:**
   * Do not wear the same pair of gloves for the care of more than one patient;
   * Do not wash gloves for the purpose of reuse; and
   * Perform hand hygiene immediately after removing gloves.
5. **Wear a gown to protect skin and clothing during procedures or activities where contact with blood or body fluids is anticipated:**

Do not wear the same gown for the care of more than one patient.

1. **Wear mouth, nose and eye protection during procedures that are likely to generate splashes or sprays of blood or other body fluids.**
2. **Wear a surgical mask when placing a catheter into the spinal canal or subdural space and when injecting material into these spaces.**

We strongly recommend outpatient settings use the checklist included with the “Guide to Infection Prevention for Outpatient Settings” document to review current policies and practices. Topics include transmission-based precautions, safe injection practices and safe medication storage.



### Infection Prevention and Control in:

**Community-based care settings including assisted living facilities, residential care facilities,**

**adult foster homes, memory care**

###### Standard precautions are recommended.

The most important infection prevention and control measures for CRE and other MDROs in the community based care setting are similar to those in outpatient and ambulatory care. Refer to the 2011 CDC booklet titled the **“Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care,”** available here: [www.cdc.gov/HAI/ settings/outpatient/outpatient-care-](http://www.cdc.gov/HAI/settings/outpatient/outpatient-care-guidelines.html)  [guidelines.html.](http://www.cdc.gov/HAI/settings/outpatient/outpatient-care-guidelines.html)(21) The most important infection prevention and control measures to prevent transmission of CRE, MDROs, norovirus and many other infections in community-based care settings are **adherence to hand hygiene and proper use of personal protective equipment (PPE) when handling bodily fluids.**

###### Key recommendations for hand hygiene in community-based care settings:

1. **Key situations where hand hygiene should be performed include:**
   * Before touching the colonized or infected person, even if gloves will be worn;
   * Before exiting the care area after touching the colonized or infected person or their immediate environment;
   * After contact with blood, body fluids or excretions, or wound dressings;
   * Before performing an aseptic task such as placing an IV, blood glucose monitoring, preparing an injection;
   * If hands move from contaminated body sites to clean body sites during care; and
   * After glove removal.
2. **The preferred method of hand decontamination is with an alcohol-based hand rub**

**Exception:** use soap and water when hands are visibly soiled or after caring for residents with known or suspected infectious diarrhea such as *Clostridium difficile* or norovirus, or after using the restroom.

###### Key recommendations for use of PPE in community-based care settings:

1. **Facilities should ensure sufficient and appropriate PPE is available and readily accessible.**
2. **Educate all health care providers on proper selection and use of PPE.**
3. **Remove and discard PPE before leaving the resident’s room or area.**
4. **Wear gloves for potential contact with blood, body fluids, mucous membranes, non-intact skin or contaminated equipment:**
   * Do not wear the same pair of gloves for the care of more than one resident;
   * Do not wash gloves for the purpose of reuse; and
   * Perform hand hygiene immediately after removing gloves,
5. **Wear a gown to protect skin and clothing during procedures or activities where contact with blood or body fluids is anticipated:**
   * Do not wear the same gown for the care of more than one resident.
6. **Wear mouth, nose and eye protection during procedures that are likely to generate splashes or sprays of blood or other body fluids.**

We strongly recommend community- based care settings use the checklist included with the “Guide to Infection Prevention for Outpatient Settings” document to review current policies and practices. Topics include transmission- based precautions, safe injection practices and safe medication storage.

### Infection Prevention and Control in:

**Individuals colonized or infected with CRE**

**living at home**

###### We recommend good hand hygiene and CRE education.

The most important message for persons living at home who are colonized or infected with CRE and other MDROs is adherence to good hand hygiene. CRE education is also important; CRE-positive persons should be informed that if they are hospitalized, additional precautions will be taken when they receive care and they should inform their health care providers of their history of CRE.

Family members or health care employees providing patient care in the home setting should use standard precautions and adhere to hand hygiene guidelines:

###### Key recommendations for hand hygiene in home settings:

1. **Key situations where hand hygiene should be performed include:**
   * Before touching the colonized or infected person, even if gloves will be worn;
   * Before exiting the care area after touching the colonized or infected person or their immediate environment;
   * After contact with blood, body fluids or excretions, or wound dressings;
   * Before performing an aseptic task such as placing an IV, blood glucose monitoring, preparing an injection;
   * If hands move from contaminated body sites to clean body sites during care; and
   * After glove removal.
2. **The preferred method of hand decontamination is with an alcohol- based hand rub**

**Exception:** use soap and water when hands are visibly soiled or after caring for persons with known or suspected infectious diarrhea such as *Clostridium difficile* or norovirus, or after using the restroom.

###### Key recommendations for use of PPE in home settings:

1. **Home care agencies should ensure sufficient and appropriate PPE is available and readily accessible.**
2. **Educate all health care providers on proper selection and use of PPE.**
3. **Remove and discard PPE before leaving the room or area.**
4. **Wear gloves for potential contact with blood, body fluids, mucous membranes, non-intact skin or contaminated equipment:**
   * Do not wear the same pair of gloves for the care of more than one person;
   * Do not wash gloves for the purpose of reuse; and
   * Perform hand hygiene immediately after removing gloves.
5. **Wear a gown to protect skin and clothing during procedures or activities where contact with blood or body fluids is anticipated:**
6. **Wear mouth, nose and eye protection during procedures that are likely to generate splashes or sprays of blood or other body fluids**

For additional information on infection prevention in your home, please refer to the Association for Professionals in Infection Control and Epidemiology (APIC) resources: [http://consumers.site.apic.org/ infection-prevention-in/your-home/](http://consumers.site.apic.org/infection-prevention-in/your-home/)



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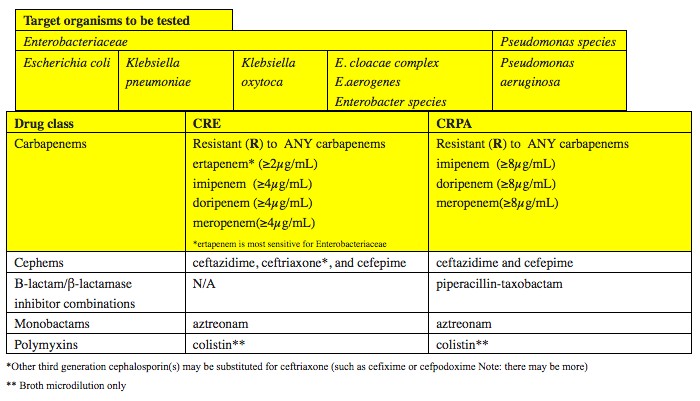
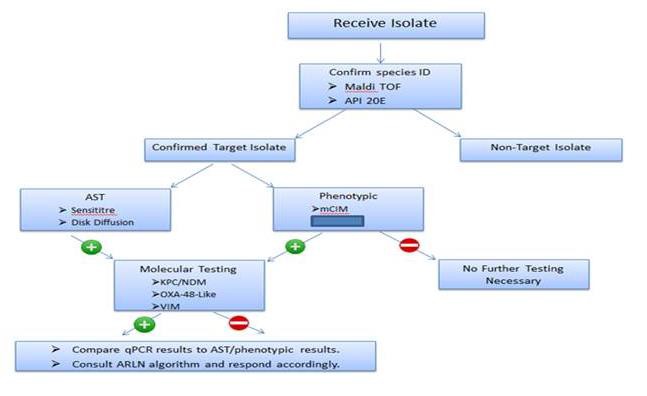
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### MA SPHL CRE Testing Algorithm



### Antibiotic Resistance Laboratory Network (ARLN)



Established in 2016, CDC’s Antibiotic Resistance Laboratory Network (AR Lab Network) supports nationwide lab capacity to rapidly detect antibiotic resistance in healthcare, food, and the community, and inform local responses to prevent spread and protect people. The AR Lab Network includes seven regional labs, the National Tuberculosis Molecular Surveillance Center (National TB Center), and labs in 50 states, six cities, and Puerto Rico. As a whole, the network tracks changes in resistance and helps identify and respond to outbreaks faster. **The regional lab for Massachusetts is the Wadsworth Center at the New York State Department of Health.**

When new resistance threats or outbreaks are detected within healthcare facilities or state and local labs, regional labs provide support, where needed, to characterize, support response, and track these discoveries. Since outbreak response varies by state, the support launched by the AR Lab Network may also vary by state or threat discovered. The regional labs will ensure more consistent and improved communication, coordination, and tracking at all levels.

The regional labs and National TB Center work together with CDC and state and local health department labs to:

* + Detect new resistance and provide better big-picture trend tracking to create pathogen-specific solutions and support national public health strategies.
  + Inform outbreak response when AR threats, like CRE, are reported, working together with state and local labs.
  + Prevent and combat future AR threats by creating better data.
  + Support innovations in antibiotic and diagnostic development. Samples from the labs will be made available through the [CDC and FDA AR Isolate Bank](https://www.cdc.gov/drugresistance/resistance-bank/index.html), which researchers can use to develop earlier diagnoses and more effective treatment options.

For more information visit: [https://www.cdc.gov/drugresistance/solutions-initiative/ar-lab-](https://www.cdc.gov/drugresistance/solutions-initiative/ar-lab-networks.html)  [networks.html](https://www.cdc.gov/drugresistance/solutions-initiative/ar-lab-networks.html) or contact MA SPHL.

### CRE Rectal Screening: Specimen Collection Protocol

**Background** :

Following isolation of a carbapenemase-producing *Enterobacteriaceae* (CRE), screening cultures may be recommended in consultation with MDPH. Other appendices provide additional information for obtaining patient consent as well as specimen processing.

**Steps to Prepare for Specimen Collection :**

1. Work with administration and infection irevention & control to clarify costs and payment for surveillance cultures.
2. Collaborate with your laboratory and MDPH regarding supplies:
   1. MDPH recommends culture swabs prepackaged in neutralizing buffer (e.g., liquid Stuarts or phosphate buffered saline).
3. Inform and educate staff about CRE. Train staff on rectal and perirectal screening specimen collection.
4. Inform and educate patients regarding CRE and the reason for screening cultures. Obtain patient consent.
5. Collaborate with the laboratory regarding:
   1. Timing of collection for optimal delivery and set-up (e.g., specimen collection on either Monday or Tuesday is typically preferred).
   2. Appropriate test order entry (e.g., screening or surveillance test).
6. Collaborate with the laboratory and infection prevention & control to manage test results.
   1. Include pertinent clinician groups (e.g., infectious diseases, critical care, pharmacy, etc).
   2. Determine manner of reporting in the patient’s chart or “flagging” of positive results.

**Specimen Collection Protocol:**

This protocol is written with culture swabs identified for rectal or perirectal sites, but it is applicable to using premoistened “sponge sticks” and other body sites, as well. If multiple sites are cultured, use one swab per site to allow better interpretation and prevent cross-contamination.

1. In consultation with MDPH, identify high-risk contacts to undergo surveillance cultures.
2. Premoisten the sterile swab in liquid transport media in the accompanying culturette tube.
3. Insert moistened tip of swab into the anal canal and turn 2-3 times.
   1. Alternatively, sample stool for culture if visible on the perianal skin or in an ostomy bag.
4. Replace swab in culturette tube and secure top.
5. Label specimen with unique patient ID, date, site and collector’s initials. Place in sealed specimen bag.
6. Make sure to note type of culture as “screening.”
7. Send specimen to the laboratory. Ensure laboratory is aware of correct methodology to process specimen.
   1. Note: ideally specimens should be plated within 4 hours of collection. If significant delay occurs before plating specimens, store swabs at 4° C for up to 3 days.

References:

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**Sample Inter-facility Infection Control Transfer Form**

**SENDING FACILITY TO COMPLETE FORM and COMMUNICATE TO ACCEPTING FACILITY**

*Please attach copies of latest culture reports with susceptibilities, if available*

|  |  |  |
| --- | --- | --- |
| Patient/Resident Last Name | First Name | Date of Birth |
| *Print or place Patient Label* |  |  |

|  |  |  |
| --- | --- | --- |
| Sending Facility Name | Sending Facility Unit | Sending Facility Phone # |
|  |  |  |

**Is the patient/resident currently on antibiotics? □ NO □ YES DX: Does the patient/resident have pending cultures? □NO □ YES**

**Is the patient/resident currently on precautions? □NO □ YES**

**Type of Precautions (check all that apply) □ Contact □ Droplet □ Airborne Isolation**

* + - **Other:**

**Does patient currently have an infection, colonization OR a history of infection or colonization with a multidrug- resistant organism (MDRO)?**

**Active infection on treatment** *Check if YES*

**MRSA** (methicillin-resistant *Staphylococcus aureus)*

**VRE** (Vancomycin-resistant *Enterococcus*)

***C. diff*** (*Clostridium difficile, CDI*)

***Acinetobacter* spp.,** multidrug-resistant

**Gram-negative organism resistant to multiple antibiotics\***

(e.g., *E. coli, Klebsiella, Proteus* etc.)

**CRE** (carbapenem-resistant *Enterobacteriaceae*)

**Other\*\*:**

**Colonization**

**or history**

*Check if YES*

\*Culture report with multiple antibiotics marked resistant (R); send copy of report with susceptibilities.

\*\*Other: lice, scabies, shingles, norovirus, influenza, tuberculosis, etc.

Does the patient/resident currently have any of the following?

* Cough or requires suctioning
* Diarrhea
* Vomiting
* Incontinent of urine or stool
* Open wounds/requiring dressing change
* Drainage (source)\_ \_
* Central line/PICC
* Hemodialysis catheter
* Urinary catheter
* Suprapubic catheter
* Percutaneous gastronomy tube
* Tracheostomy

Person completing this form: Date:

**LTCF GENERAL ROOM ENVIRONMENTAL CLEANING CHECKLIST**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unit or Ward: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Room: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Initials of environmental services staff (optional):**1

|  |  |  |  |
| --- | --- | --- | --- |
| **Evaluate the following priority sites for each resident room:** | | | |
| **High-touch Room Surfaces**2 | **Cleaned** | **Not Cleaned** | **Not Present in Room** |
| Bed rails |  |  |  |
| Tray table |  |  |  |
| Call button |  |  |  |
| Remote Controls |  |  |  |
| Bedside table |  |  |  |
| Bedside Chair |  |  |  |
| Telephone |  |  |  |
| Room light switch |  |  |  |
| Room inner door knob/door pull |  |  |  |
| Closet door knob/door pull |  |  |  |
| Bathroom inner door knob/pull |  |  |  |
| Bathroom light switch |  |  |  |
| Bathroom handrails by toilet |  |  |  |
| Bathroom sink/faucet handles |  |  |  |
| Toilet seat |  |  |  |
| Toilet flush handle |  |  |  |
| Toilet bedpan cleaner |  |  |  |
| Shower hand holds |  |  |  |
| **Evaluate the following additional sites if these equipment are present in the room:** | | | |
| **High-touch Room Surfaces**2 | **Cleaned** | **Not Cleaned** | **Not Present in Room** |
| IV /tube feeding pump control panel |  |  |  |
| Wound Vacuum Control panel |  |  |  |
| Wheelchair-especially handles |  |  |  |
| Walker /Cane handles |  |  |  |

1. Facilities may choose to include identifiers of individual environmental services staff for feedback purposes
2. Sites most frequently contaminated and touched by residents and/or healthcare workers

# LTCF COMMON AREAS ENVIRONMENTAL CLEANING CHECKLIST

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Unit or Ward: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Initials of environmental services staff (optional):**

|  |  |  |  |
| --- | --- | --- | --- |
| **Evaluate the following priority sites for each resident room:** | | | |
| **High-touch Common Surfaces**2 | **Cleaned** | **Not Cleaned** | **Not Present in Room** |
| Common Light Switch |  |  |  |
| Common Call Button |  |  |  |
| TV Remote Controls |  |  |  |
| Common Chair |  |  |  |
| Common Telephone |  |  |  |
| Mechanical Lift |  |  |  |
| Hall Hand Rails |  |  |  |
| Door Pulls |  |  |  |
| Common Closet Door Knobs/Pull |  |  |  |
| Microwave Control Panel |  |  |  |
| Refrigerator/Freezer Handles |  |  |  |
| Bathroom inner door knob/pull |  |  |  |
| Bathroom light switch |  |  |  |
| Bathroom handrails by toilet |  |  |  |
| Bathroom sink/faucet handles |  |  |  |
| Bathroom toilet seat |  |  |  |
| Toilet flush handle |  |  |  |
| Common Tub Faucet Handles |  |  |  |
| Common Shower hand holds |  |  |  |
| Common Bench |  |  |  |
| **Evaluate the following additional sites if these equipment are present in the facility:** | | | |
| **High-touch Surfaces**2 | **Cleaned** | **Not Cleaned** | **Not Present in Room** |
| Beauty Salon Chair |  |  |  |
| PT/OT Support Bars |  |  |  |
| Washer/Dryer Knobs |  |  |  |
| Activity Room Tables |  |  |  |

**REFERENCE:** Guh, A., Carling, P., and the Environmental Evaluation Workgroup. (2010). [Options for Evaluating](https://www.cdc.gov/hai/toolkits/evaluating-environmental-cleaning.html)  [EnvironmentalCleaning.](https://www.cdc.gov/hai/toolkits/evaluating-environmental-cleaning.html) Centers for Disease Control and Prevention.

**DISCLAIMER**: All data and information provided by the Oregon Patient Safety Commission is for informational purposes only. The Oregon Patient Safety Commission makes no representations that the patient safety recommendations will protect you from litigation or regulatory action if the recommendations are followed. The Oregon Patient Safety Commission is not liable for any errors, omissions, losses, injuries, or damages arising from the use of these recommendations.

**Unit: Date:**

**Hand Hygiene Observation Tool**

**Observer Name:**

**Hand hygiene observation tool**

* **DIRECTIONS** - **If you believe you observed ‘no hand hygiene’ or are unsure, please confirm with staff privately; remind if applicable.** (Some staff members carry their own hand sanitizer. Remember to observe **‘hands full’** process in its entirety).
* **FORM UPDATES**:
  + '**Nursing’ is now ‘Nursing (RN)’, Nursing (CNA)’ and Nursing (Tech) ‘Students’ are now ‘Student (Nursing)’, ‘Student (CNA)’, ‘Student (Medical)’, ‘Student (Other)’. The ‘OTHER’ section is alphabetized and ‘Cath Lab’ (personnel) has been added.**
  + **Surgeons and Medical Providers are divided by specialty – record by #.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Role of Observed Person** | | | | | | | | | | | | | | | | **Observed Behavior** | | | | | |
| **Nursing (RN)** | **Nursing (CNA)** | **Nursing (Tech)** | **Surgeon**   1. **Cardiac** 2. **General** 3. **Neuro** 4. **OB/Gyn** 5. **Orthopedic** 6. **Plastics** 7. **Urology** 8. **Other** 9. **Unknown** | **Prov (Medical)**   1. **Cardiology** 2. **Emergency** 3. **Fam Practice** 4. **GI** 5. **Internal Med** 6. **Nephrology** 7. **Neurology** 8. **Oncology** 9. **Pediatrics** 10. **Psychiatry** 11. **Radiology** 12. **Other** 13. **Unknown** | **Provider (Hospitalist)** | **Provider (Anesthesia)** | **Provider (PA/NP)** | **Provider (CNM)** | **Provider (Resident/Fellow)** | **Provider (Unknown)** | **Student (Nursing)** | **Student (CNA)** | **Student (Medical)** | **Student (Other)** | **OTHER – use # 1 Admitting**   1. **Cath Lab** 2. **Clergy** 3. **Engineering** 4. **EVS** 5. **Imaging** 6. **Lab** 7. **Nutr Services** 8. **Pharmacy** 9. **PT-OT-ST** 10. **Resp Therapy** 11. **SS/Case Mgmt** 12. **Transport** 13. **Unknown** | **Circle ONE** | **Blocked view/ unsure** | **Used hand sanitizer** | **Hand washing w/ soap and water** | **No hand hygiene – ask remind** | **Comments – record name of observed staff member, feedback given, response, etc.** |
| **1** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **2** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **3** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **5** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **6** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **7** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **8** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **9** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **10** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **13** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **14** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **15** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |
| **16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | **IN OUT** |  |  |  |  |  |

Revised 4-10-12



MASSACHUSETTS PUBLIC HEALTH FACT SHEET

**Carbapenem-­‐resistant *Enterobacteriaceae* (CRE)**

**What is CRE?**

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CRE, which stands for Carbapenem-­‐Resistant *Enterobacteriaceae,* are particular germs (bacteria) that are often resistant to many antibiotics, including some called carbapenems. Common CRE are *E. coli, Klebsiella* species, and *Enterobacter* species. When these germs are resistant to antibiotics, they make the antibiotics ineffective in killing the germs.

##### What are carbapenems?

Carbapenems are antibiotics that include doripenem, ertapenem, imipenem, and meropenem. They are some of the strongest antibiotics and are often used for treating severe infections. Resistance to these antibiotics is considered a public health threat.

##### How do CRE make people sick?

CRE can cause many types of infections, including urinary tract infections, abdominal infections, pneumonia, and bloodstream infections. They tend to also be resistant to many other antibiotics, making them difficult to treat.

##### Do CRE always make people sick?

No. Some people can be exposed to CRE and can carry the germs in their intestines (gut) for a period of time and not know they are carrying them. They do not have an infection. They do not have any signs or symptoms of illness. This is called “colonization.”

##### How are CRE spread?

To get a CRE infection, a person must be exposed to CRE germs. CRE germs are usually spread from person to person through contact with someone infected or colonized with the germs, especially through contact with infected wounds or stool. CRE can cause infections when they enter the body, and this often happens through medical devices like urinary catheters, intravenous catheters, ventilators, or through the germs getting into wounds caused by injury or surgery.

##### Who is at risk for infection with CRE?

Healthy people are generally not at risk for infections with CRE. CRE primarily affect patients in healthcare settings. CRE are more likely to affect patients who are ill with other conditions and/or have invasive devices, like tubes going into their body. Use of certain types of antibiotics can put patients at higher risk for acquiring CRE infections. Receiving healthcare in certain parts of the world can also put people at increased risk.

##### How will my doctor know if I have CRE?

The only way to tell is with lab tests. Lab tests will also help your doctor decide which antibiotic should be used for treatment, if antibiotic treatment is necessary.

Your doctor will usually take a sample from the infected area, which could include blood or body fluids. The sample will be sent to a laboratory to see if infection is caused by CRE.

##### How are CRE infections treated?

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If CRE are causing an infection, the antibiotics that will work against them are limited, but options are available. While strains that are resistant to all antibiotics are very rare, unfortunately they have been reported.

Lab tests help your doctor decide which antibiotic should be used for treatment, if antibiotic treatment is necessary. If antibiotics are prescribed, it is important to use the medication as directed unless your doctor tells you to stop. If the infection has not improved within a few days, your doctor may prescribe a different antibiotic.

##### How can I prevent CRE infection?

* Take antibiotics only as prescribed.
* Tell your doctor if you have been hospitalized or received health care in another country.
* Expect all healthcare providers to wash their hands with soap and water or use an alcohol-­‐ based hand sanitizer before and after touching your body or tubes going into your body. If they do not, ask them to do so.
* Keep your own hands clean by washing them frequently with soap and warm water or use an alcohol-­‐based hand sanitizer.
* People providing care at home for patients with CRE should be careful about washing their hands, especially after contact with wounds or helping the patient to use the bathroom or after cleaning up. Caregivers should also make sure to wash their hands before and after handling the patient’s medical device (for example, urinary catheters). This is particularly important if the caregiver is caring for more than one ill person at a time. Gloves should be always be used when anticipating contact with body fluids or blood.

##### What if I have CRE?

Follow your healthcare provider’s instructions. If your provider prescribes antibiotics, take them exactly as instructed and finish the full course, even if you feel better. Wash your hands, especially after you have contact with the infected area and after using the bathroom. Follow any other hygiene advice your provider gives you.

##### What are some things healthcare facilities are doing to prevent CRE?

To prevent the spread of CRE, healthcare personnel and facilities should follow infection control precautions. These include:

* + Washing hands with soap and water or using an alcohol-­‐based hand sanitizer before and after caring for a patient
  + Carefully cleaning and sanitizing of rooms, and cleaning and disinfecting medical equipment
  + Wearing gloves and a gown before entering the room of a patient with CRE
  + Keeping patients with CRE infections in a single room or sharing a room with someone else who has the same CRE infection
  + Whenever possible, dedicating specific equipment and staff to patients with CRE
  + Removing gloves and gown and washing hands before leaving the room of a patient with CRE
  + Only prescribing antibiotics when necessary

**HEALTHCARE - ASSOCIATED INFECTIONS**

**WHAT PATIENTS C AN DO**

**BE INF ORM ED. BE EM PO WERED. BE PREPARED.** 6**WAY S T O B E A SA F E PAT I E N T**

1

**SPEAK UP.**

Talk to your doctor about all questions or worries you have. Ask them what they are doing to protect you.

If you have a catheter, ask each day if it is necessary.

Ask your doctor how he/she prevents surgical site infections. Also ask how you can prepare for surgery to reduce your infection risk.

2

**CLEAN.**

KEEP HANDS

Be sure everyone cleans their hands before touching you.

3

**GET SMART** ABOUT ANTIBIOTICS.

Ask if tests will be done to make sure the right antibiotic is prescribed.

4

**KNOW** THE SIGNS AND SYMPTOMS OF INFECTION.

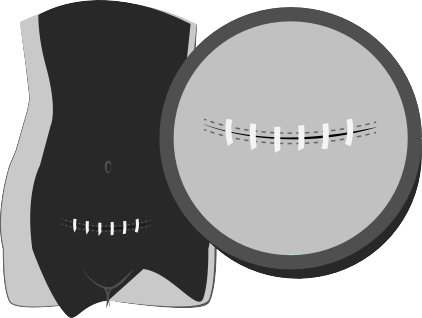
Some skin infections, such as MRSA, appear as redness, pain, or drainage at an IV catheter site or surgery site. Often these symptoms come with a fever. Tell your doctor if you have these symptoms.

5

**WATCH OUT** FOR DEADLY DIARRHEA.

(AKA *C. difficile*)

Tell your doctor if you have 3 or more diarrhea episodes in 24 hours, especially if you have been taking an antibiotic.



6

**PROTECT YOURSELF.**

Get vaccinated against flu and other

infections to avoid complications. 245525-E