



CRE Reporting

Carbapenem-resistant Enterobacteriaceae (CRE) is a reportable condition in the State of Missouri. For a full list of reportable conditions, see: 19 CSR 20-20.020, <https://www.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c20-20.pdf>. CRE is reportable quarterly, in aggregate fashion. Reporting is required for the following CRE organisms in Missouri:

- ***Enterobacter* spp.**
- ***Escherichia coli* (*E. coli*)**
- ***Klebsiella* spp.**

Reporting of other CRE organisms is encouraged.

The first CRE quarterly reporting reminder email will follow the MRSA/VRE reporting reminder in January 2019. The reporting form will be included as an attachment with the reminder email.

Definition of carbapenem-resistant Enterobacteriaceae (CRE):

- Resistant to any carbapenem antimicrobial (i.e., minimum inhibitory concentrations of ≥ 4 mcg/ml for doripenem, meropenem, or imipenem OR ≥ 2 mcg/ml for ertapenem)

OR

- Documented to produce carbapenemase (e.g., KPC, NDM, VIM, IMP, OXA-48)

In addition:

- For bacteria that have intrinsic imipenem nonsusceptibility (i.e., *Morganella morganii*, *Proteus* spp., *Providencia* spp.), resistance to carbapenems other than imipenem is required.
- At present, acceptable tests for detecting carbapenemases include polymerase chain reaction, modified Hodge test (MHT), Carba NP, metallo- β -lactamase testing (e.g., MBL tests or screens). The number of available tests for carbapenemase is expanding; facilities using a test not included on the list above should review the test performance to ensure that it has reasonable sensitivity and specificity.

Carbapenemase-producing CRE (CP-CRE)

The subset of CRE includes carbapenemase-producing organisms (CP-CRE) which contain mobile resistance elements that facilitate transmission of resistance to other Gram negative bacilli. Early detection and aggressive implementation of infection prevention and control strategies are necessary to prevent further spread of CP-CRE, especially novel CP-CRE. Testing for CP-CRE is available for select CRE isolates through the Antibiotic Resistance Laboratory Network.

Contact the Missouri State Public Health Laboratory for carbapenemase screening requests at 573-751-3334.

CP-CRE Reporting:

Individual cases of CP-CRE infections are to be immediately reported to the Missouri Department of Health and Senior Services (DHSS) in accordance with 19 CSR 20-20.020 1(C). “Instances, clusters, or outbreaks of unusual, novel, and/or emerging diseases or findings not otherwise named in this rule, appearing to be naturally occurring, but posing a substantial risk to public health and/or social and economic stability due to their ease of dissemination or transmittal, associated mortality rates, or the need for special public health actions to control.”

Note: Case patients with multiple specimen collections of the same genus/species of CP-CRE and carbapenem resistance profile should be reported as an incident case only once every 30 days. If a different CP-CRE genus/species or a more-resistant profile is identified within the 30-day window period then this should be reported as a separate incident case.

Definition of carbapenemase-producing carbapenem-resistant Enterobacteriaceae (CP-CRE):

Reportable CP-CRE include:

- ***Enterobacter* spp.**
- ***Escherichia coli* (*E. coli*)**
- ***Klebsiella* spp.**

Reporting of other CP-CRE organisms is encouraged.

Laboratory Criteria

Laboratory evidence of carbapenemase production in an isolate by a phenotypic method or positive for a known carbapenemase resistance mechanism by the specific testing methods, such as:

Phenotypic methods for carbapenemase production:

- Carba NP positive
- Metallo- β -lactamase testing (e.g., E-test) positive
- Modified Carbapenem Inactivation Method (mCIM) positive or indeterminate
- Carbapenem Inactivation Method (CIM) positive
- Modified Hodge Test (MHT) positive
- Positive for phenotypic carbapenemase production (e.g., mCIM, CIM, CarbaNP) but negative by PCR (e.g., Xpert Carba-R) for all known resistance mechanisms (e.g. KPC, NDM, OXA-48, VIM, IMP)

Molecular methods for resistance mechanism:

- PCR positive (for KPC, NDM, OXA-48, IMP, or VIM)
- Xpert Carba-R positive (for KPC, NDM, OXA-48, VIM, IMP)
- PCR or Xpert Carba-R positive for novel carbapenemase

Case Classification

Confirmed

E. coli, *Klebsiella spp.*, or *Enterobacter spp.* from any isolate that is:

- Positive for known carbapenemase resistance mechanism (e.g., KPC, NDM, VIM, IMP, OXA-48) demonstrated by a recognized test (e.g., polymerase chain reaction (PCR), Xpert Carba-R)

OR

- Positive on a phenotypic test for carbapenemase production (e.g., metallo- β -lactamase test, modified Hodge test, Carba NP, Carbapenem Inactivation Method (CIM), or modified CIM (mCIM))

For questions related to CRE reporting, please contact the HAI Coordinator in the Bureau of Communicable Disease Control and Prevention at 573-751-6113, or by email at

HAI_Reporting@health.mo.gov