

Carbapenem-Resistant Enterobacteriaceae (CRE)



What are Carbapenem-Resistant Enterobacteriaceae? Carbapenem-Resistant Enterobacteriaceae (CRE) are a group of gram-negative enteric bacteria resistant to all beta-lactam antibiotics (third generation cephalosporins) plus carbapenem-class antibiotics. The most common species of CRE is *Klebsiella pneumoniae*. However, *E.coli*, *Enterobacter*, *Citrobacter*, *Morganella*, and others may also be CRE.

What are the clinical implications of CRE? CRE can cause urinary tract, bloodstream, wound, and respiratory tract infections. CRE infections have been associated with increased hospital costs, length of stay, and high rates of morbidity and mortality, particularly among persons with prolonged hospitalizations, the critically ill, and those with indwelling devices (urinary or venous catheters, ventilators). Because CRE infections are resistant to many antibiotics, it often makes the infections difficult to treat. CRE are also capable of asymptomatically colonizing patients (rectal carriage is most common).

How are CRE transmitted? CRE are spread from person-to-person by direct or indirect contact via contaminated hands or objects. In the healthcare setting it is important for healthcare workers to sanitize hands between patients to prevent transmission.

What prevention measures are recommended to prevent the transmission of CRE in a healthcare facility? Standard precautions, notably hand hygiene, are required for all patients in all healthcare facilities. Current guidelines recommend that facilities take additional precautions to control CRE when logistically feasible. Enhanced prevention measures include:

- Contact precautions – To reduce the probability of contamination of hands and clothing, healthcare providers should gown and glove while caring for CRE patients.
- Private room – When possible, it is recommended to place CRE patients in private rooms to prevent spreading CRE to a roommate.
- Intra-facility Communication – When a CRE is identified by the facility lab, it is important for the lab to promptly relay that information to infection control and prevention staff so that precautions can be initiated.
- Inter-facility Communication – When CRE patients are transferred from one care facility to another, it is important for the discharging facility to inform the receiving facility of the patient's CRE status.

Is it required to report cases of CRE to the health department? Individual cases of CRE are not reportable in the State of Michigan. In the event of a suspected outbreak, facilities (e.g. hospitals, skilled nursing facilities) should notify their local public health department. A CRE 'outbreak' is defined as 3 or more epidemiologically-linked, culture-confirmed cases. CRE should be reported as an 'Unusual Occurrence' in areas of the state where CRE has not been previously identified.

Quick Tips:

- CRE patient rooms should be cleaned with an EPA-registered disinfectant. Bleach is not required.
- The visitors of CRE patients should follow the facility's visitor guidelines. Generally, visitors only need to wear gowns and gloves for direct patient care.
- Sometimes CREs are called KPCs. KPC stands for *Klebsiella pneumoniae* carbapenemase. KPC is the gene which is responsible for the organism's carbapenem resistance.
- KPC is responsible for the majority of CRE in the United States.
- KPC is not limited to just *Klebsiella pneumoniae*; other bacterial species can possess the KPC gene.

References

- <http://www.cdc.gov/hicpac/pdf/guidelines/MDROGuideline2006.pdf>
- <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5810a4.htm>
- http://www.cdc.gov/HAI/pdfs/labSettings/HodgeTest_Carbapenemase_Enterobacteriaceae.pdf
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