

Carbapenem–Resistant *Enterobacterales* (CRE)



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What are CRE?

Carbapenems are a group of antibiotics that are usually used to treat serious infections and are considered antibiotics of last resort for some infections. *Enterobacterales* are a family of germs that are found in normal human intestines (gut). Antibiotic resistance happens when antibiotics are no longer effective in killing a germ. CRE are a family of germs that are difficult to treat because they have high levels of resistance to antibiotics.

What are carbapenemase-producing CRE (CP-CRE)?

Carbapenemases are enzymes that break down (inactivate) carbapenem antibiotics. Carbapenemases increasingly have been reported in *Enterobacterales* in recent years. CP-CRE can include *Klebsiella pneumoniae* carbapenemase (KPC), Verona integron-encoded metallo-beta-lactamase (VIM) and New Delhi metallo-beta-lactamase-1 (NDM-1). VIM has been reported worldwide, but is more common in southern Europe and Asia. NDM-1 originated in the United Kingdom, India and Pakistan but is now worldwide. Detection of infected patients and carriers with CP-CRE is necessary for prevention of their spread. Identification of the carbapenemase genes relies mostly on molecular laboratory testing.

What are the symptoms of CRE?

Sometimes, CRE can spread outside the gut and cause serious infections, such as urinary tract infections, bloodstream infections, wound infections and pneumonia. Some CRE germs have become resistant to almost all available antibiotics and can be deadly.

How is CRE infection spread?

To get a CRE infection, a person must be exposed to CRE germs. CRE germs are usually spread person to person through contact with infected wounds or feces. CRE can cause infections when they enter the body, often through medical devices like ventilators (breathing machines), intravenous (vein) catheters, urinary (bladder) catheters, endoscopes or wounds caused by injury or surgery.

Fast Facts

- Carbapenems are considered last resort antibiotics
- CRE have high antibiotic resistance levels
- CRE live in the gut, but can migrate to other parts of the body
- CRE are usually spread person-to-person
- Those with compromised immune systems are at higher risk of infection
- Frequent hand washing is the main prevention methods

How are CRE infections prevented?

Individuals should tell their healthcare provider if they have recently been hospitalized in another facility or received healthcare in another country. Antibiotics should only be taken exactly as prescribed. Frequent and proper hand washing is the most effective means of preventing the spread of germs as detailed in handwashing quick facts.

How is CRE infection treated?

People may have the CRE germ in or on their body without it producing an infection. These people are said to be colonized with CRE, and they do not need antibiotics for the CRE. If the CRE are causing an infection, then the antibiotics that will work against it are limited. Additionally, some infections might be able to be treated with other therapies, like draining the infection. Strains that have been resistant to all antibiotics are rare but have been reported.

Who is at risk to get a CRE infection?

Healthy people usually don't get CRE infections. CRE primarily affect patients that are being treated for another condition in acute and long-term healthcare settings. CRE are more likely to affect those patients who have compromised immune systems or have invasive devices like tubes going into their body. Taking long courses of certain antibiotics might also make it more likely for patients to get CRE infection. CRE have been spread during endoscopic retrograde cholangiopancreatography (ERCP), a medical procedure that involves inserting a specialized endoscope (duodenoscope) into the mouth and down to the intestine where the bile duct attaches.

Resources for CRE

All information presented is intended for public use. For more information, please refer to:

<http://www.cdc.gov/hai/organisms/cre/cre-patients.html>

<http://www.cdc.gov/hai/>

For additional information on CRE:

<http://bit.ly/IDOHCREs>

