

Carbapenem-Resistant Enterobacteriaceae (CRE) Infections: Patient Frequently Asked Questions

What are CRE?

CRE stands for “**C**arbapenem-**R**esistant **E**nterobacteriaceae.” Enterobacteriaceae are a family of germs that are difficult to treat because they have high levels of resistance to antibiotics. CRE are an important emerging threat to public health.

Common enterobacteriaceae include *Klebsiella species* and *Escherichia coli (E. Coli)*. These germs are found in normal human intestines (gut). Sometimes these bacteria can spread outside the gut and cause serious infections, such as urinary tract infections, infections in the blood, wound infections and pneumonia. Enterobacteriaceae can cause infections in people in both healthcare and community settings.

Carbapenems are a group of antibiotics that are usually reserved to treat serious infections, particularly when these infections are caused by germs that are highly resistant to antibiotics. Sometimes carbapenems are considered to be antibiotics of last resort for some infections. Some Enterobacteriaceae can no longer be treated with carbapenems because they have developed resistance to these antibiotics (ie. CRE); resistance makes the antibiotics ineffective in killing the resistant germ.

Resistance to carbapenems can be due to a few different mechanisms. One of the more common ways the Enterobacteriaceae become resistant to carbapenems is due to the production of **K**lebsiella **P**neumoniae **C**arbapenemase (KPC). KPC is an enzyme that is produced by some CRE that was first identified in the United States. KPC breaks down carbapenems and makes them ineffective.

How Are CRE 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 or colonized people, particularly contact with wounds or stool. CRE can cause infections when they enter the body, often through medical devices like ventilators, intravenous catheters, urinary catheters, or wounds caused by injury or surgery.

Who is most likely to get an infection with CRE?

Healthy people usually don't get CRE infections. CRE primarily affects patients in acute and long-term care settings, who are being treated for another condition. CRE are more likely to affect those patients who have compromised immune systems or have invasive devices like tubes going into their body. Use of certain types of antibiotics might also make it more likely for patients to get CRE.

Can CRE be treated?

Many people with CRE will have the 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, the antibiotics that will work against it are limited but some options are often available. In addition, some infections might be able to be treated with other therapies, like draining the infection. Strains that have been resistant to all antibiotics are very rare but have been reported.

What are some things that hospitals are doing to prevent CRE infections?

To prevent the spread of CRE, healthcare personnel and facilities can follow infection control precautions provided by the Centers for Disease Control (CDC). These include:

- Washing hands with soap and water or an alcohol based hand sanitizer before and after caring for a patient
- Carefully cleaning and disinfecting rooms and medical equipment
- Wearing gloves and a gown before entering the room of a CRE patient
- Keeping patients with CRE infections in a single room or sharing a room with someone else who has a CRE infection
- Whenever possible, dedicating equipment to CRE patients
- Removing gloves and gown and washing/decontaminating hands before leaving the room of a CRE patient
- Only prescribing antibiotics when necessary
- Removing temporary medical devices (ie, catheters) as soon as possible

What can patient do to prevent CRE infections?

Patients should:

- Tell your doctor if you have been hospitalized in another facility or country
- Take antibiotics only as prescribed
- Expect all doctors, nurses, and other healthcare providers to wash their hands with soap and water or an alcohol based hand rub before and after touching your body or tubes going into your body. If they do not ask, ask them to do so.

- Clean your own hands often, especially:
 - Before preparing or eating food
 - Before and after changing wound dressings or bandages
 - After using the bathroom
 - After blowing your nose, coughing, or sneezing

Ask questions. Understand what is being done to you, the risks and the benefits.

What if I have CRE?

Follow your doctors' instructions. If your doctor prescribes you 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 that your doctor provider tells you.

I am caring for someone with CRE at home; do I need to take special precautions?

CRE has primarily been a problem among people with underlying medical problems, especially those with medical devices like urinary catheters or those with chronic wounds. Otherwise healthy people are probably at relatively low risk for problems with CRE. People providing care at home for patients with CRE should be careful about washing their hands, especially after contact with wounds or helping the CRE patient to use the bathroom or after cleaning up stool. Caregivers should also make sure to wash their hands before and after handling the patient's medical device (eg, urinary catheters). This is particularly important if the caregiver is caring for more than one ill person at home. In addition, gloves should be used when anticipating contact with any blood or body fluids.

References:

CDC 2012 CRE Toolkit - Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE)

Web address: <http://www.cdc.gov/hai/organisms/cre/cre-toolkit/f-level-prevention.html>