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### **What are carbapenem-resistant Enterobacteriaceae (CRE)?**

Enterobacteriaceae are a group of bacteria normally found in the human gut. Common types include *E. coli* and *Klebsiella* species. Carbapenems are a class of antibiotics that were developed to treat bacteria that are resistant to other drugs. Because of the overuse of these antibiotics, some types of Enterobacteriaceae are resistant to carbapenems and these bacteria are called carbapenem-resistant Enterobacteriaceae (CRE).

### **Who gets CRE?**

Healthy people usually do not get CRE infections. In healthcare settings, CRE infections might occur in patients who are receiving treatment for other conditions. Patients whose care requires devices like ventilators (breathing machines), urinary (bladder) catheters, or intravenous (vein) catheters, and patients who are taking long courses of certain antibiotics are most at risk for CRE infections.

### **How are CRE spread?**

CRE can be transmitted by direct contact with an infected person or by indirect contact with contaminated items (e.g., medical equipment) or environmental surfaces (e.g., bed rails, door knobs).

### **What are the symptoms of CRE?**

Some people carry CRE bacteria in their bodies without any symptoms. This is called being “colonized.” A person might be colonized for a long time before getting sick or might never get sick. Enterobacteriaceae can cause a variety of infections including gastrointestinal illness, pneumonia, wound infections, and invasive infections of the blood or other body organs. CRE cause the same infections, but the infections are much harder to treat.

### **How soon after exposure do symptoms appear?**

The time between exposure and symptom onset varies for different types of Enterobacteriaceae. For CRE, it is not well known how soon symptoms appear after exposure. In most situations, exposure to CRE does not lead to illness. The person might carry the CRE in his or her body, but not get sick at all, or might get sick from the CRE days or weeks later.

### **How are CRE diagnosed?**

Special laboratory tests are needed to identify specific bacteria that cause infections and which antibiotics, if any, would be effective for treating the infections.

### What is the treatment for CRE?

Treatment options depend on the type of CRE infection. Some CRE infections can be treated if the bacteria have not yet developed resistance to certain other types of antibiotics. Some types of CRE are “pan resistant” which means the CRE bacteria are resistant to all specific antibiotics tested. If you have CRE, your physician will work with you to figure out the best course of treatment.

### How can the spread of CRE be prevented?

Use of good infection prevention practices (such as wearing a gown and gloves when caring for patients with CRE, and frequent hand hygiene by healthcare workers) can limit the spread of CRE in healthcare settings. Patients with CRE should follow all instructions given by their care providers and keep their hands clean, especially after touching the affected area or using the bathroom.

Friends or family members visiting a hospitalized patient with CRE should follow the hospital’s recommended precautions. Healthcare facilities can follow the guidance outlined in the [Centers for Disease Control and Prevention \(CDC\) CRE toolkit](#).

### What if I have CRE?

Be sure to notify the healthcare provider every time you go to a medical visit, hospital, nursing home, or dialysis clinic. Bring this paper if you need help remembering the name of the bacteria.

Follow your healthcare provider’s instructions. If your provider prescribes you antibiotics, take them exactly as instructed and finish the full course, even if you feel better. Follow any other medical or hygiene advice your provider gives you.

Wash your hands with soap and warm water, especially before eating or preparing food, before and after changing wound dressings or bandages, after using the bathroom, and after blowing your nose, coughing, or sneezing. Use alcohol-based hand sanitizer when soap and water are not available. This is good advice for everyone. Make sure your caregivers wash their hands before they care for you. They should also wash their hands after contact with wounds, helping you use the bathroom, after cleaning up stool, and before and after handling medical devices (e.g., urinary catheters). Gloves should be used for possible contact with body fluids or blood.

### What if I am caring for someone with CRE at home?

CRE have 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 (e.g., 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 body fluids or blood.

### How can I get more information about CRE?

- If you have concerns about CRE, contact your healthcare provider.
- Call your local health department. A directory of local health departments is located at the [VDH Local Health Districts page](#).
- Visit the [Virginia Department of Health website about CRE in the healthcare setting](#).
- Visit the Centers for Disease Control and Prevention website at [the CDC page on CRE](#).

### Translations

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Amharic](#)

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Arabic](#)

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Chinese](#)

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Dari](#)

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Haitian Creole](#)

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Korean](#)

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Spanish](#)

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Tagalog](#)

[Carbapenem-resistant Enterobacteriaceae Fact Sheet in Vietnamese](#)

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