

# Carbapenem-Resistant Enterobacteriaceae (CRE) Infection



Carbapenem-resistant Enterobacteriaceae (CRE) are types of bacteria. They can cause infections. These infections can be hard to treat. CRE got their name because they are resistant to a type of antibiotic medicine (carbapenems).

Healthy people usually don't get a CRE infection. Patients in hospitals have the highest risk for a CRE infection. Those who are already very ill are more at risk. People of all ages can get infected with CRE. There are different types of bacteria that are all called CREs. One example is *Klebsiella pneumoniae*. These bacteria cause a lung, wound, or urinary infection.

## Understanding antibiotic resistance

Antibiotic medicine is used to kill some types of bacteria. There are many kinds of antibiotics. Over time some bacteria may no longer respond to them. This is called antibiotic resistance. For many years, bacteria have shown resistance to common types of antibiotics. Healthcare providers then used certain other advanced antibiotics (carbapenems) to kill these germs. But now this doesn't work on many types of CRE bacteria.

Frequent and overused antibiotics have helped cause the growth of bacteria such as CRE. If you have an infection from bacteria, you may take an antibiotic. The medicine will work if you have a strain of the bacteria that is not resistant. But a few bacteria may survive. They may acquire new genes. These new genes can allow them to resist the antibiotic. These resistant bacteria may then spread. They may cause an infection that is hard to treat.

## Who is at risk for CRE infection?

Certain things may make it more likely that you will get a CRE infection. These include:

- A recent stay in the hospital, especially one where CRE has been found
- A stay in a long-term care facility
- Use of antibiotics
- Recent organ or stem-cell transplantation
- Being on a breathing machine (mechanical ventilator)
- Use of medical devices inside the body, such as a urinary catheter

Other things may raise the risk for death from a CRE infection. These include other serious illnesses. Older adults and very young children are most at risk of dying from CRE infections.

## Symptoms of CRE infection

Symptoms of a CRE infection vary. They may differ because of the type of the bacteria and the infection site. Symptoms may include:

- Fever, chills, and tiredness
- Shortness of breath if you have pneumonia
- Pain when you pee if you have a urinary tract infection
- Skin pain and swelling if you have a skin or wound infection
- Belly pain if you have a liver or spleen infection

- Stiff neck and reduced consciousness if you have infection of the tissues around the brain and spinal cord (meningitis)

## Diagnosing a CRE infection

Your healthcare provider will ask about your health history and your symptoms. You will be given a physical exam. You will have tests that may include:

- Blood tests to check for signs of infection and anemia
- Chest X-ray to check for lung infection
- Urine test to check for urinary infection
- Other imaging tests as needed
- Blood culture test to see if bacteria are present in your blood
- Sensitivity test to confirm if you are infected with CRE

## Treatment for a CRE infection

Treatment depends on the type and site of the infection. Your treatment may include:

- Careful watching of vital signs, such as heart rate
- Medicines to reduce fever
- Fluids given by IV (intravenously)
- Nutrition given by IV, tube, or mouth
- Treatment of other health conditions
- Breathing support with a ventilator, if needed
- Treatment with other antibiotics

## Possible complications of a CRE infection

Possible complications from CRE vary. They depend on the type and site of infection. For instance, a lung infection from CRE may cause a pocket of bacteria and fluid (abscess) in the lung. Sepsis is a serious problem caused by CRE. Sepsis occurs when the infection enters your bloodstream. It can lower blood flow to vital organs. It is a medical emergency and may cause death.

## Preventing a CRE infection

You can help prevent the spread of a CRE infection. These are some of the things you can do:

- Always take your antibiotics as directed.
- Don't take antibiotics unless they are needed. For instance, antibiotics won't help viral infections. And antibiotics are generally not needed for the normal bacteria found in or on your body unless they're causing a problem.
- Ask your healthcare team about removing possible sources of infection, such as a catheter.
- Ask your healthcare providers to wash their hands before and after touching your body or any tubes that go into your body.

- Wash your hands often with soap and clean, running water.

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