

What are CRE?

CRE are bacteria that are resistant to most antibiotics due to the production of an enzyme called carbapenemase. *Enterobacteriaceae* is a family of bacteria and many of these bacteria live in our environment (such as soil or water) and some of them live in the human gut. Sometimes the bacteria can get into our bodies and cause pneumonia, kidney and bladder infections, wound infections and bloodstream infections.

Because of antibiotic overuse, some of the *Enterobacteriaceae* bacteria have become resistant to most of the available antibiotics. Carbapenem antibiotics were developed to treat bacteria resistant to most other antibiotics, but several years ago this group of organisms became resistant to the carbapenem antibiotics. The organisms are called Carbapenem-Resistant *Enterobacteriaceae* or CRE.

Carbapenemase was first found in *Klebsiella pneumoniae* isolates, but it can be produced by other organisms including *Serratia* spp., *Enterobacter* spp., *E. coli*, and *Salmonella enterica*. The production of these enzymes may result in resistance to all penicillins, cephalosporins, carbapenems and aztreonam in any bacteria, not just *Enterobacteriaceae*.

Who is at risk for CRE?

Healthy people usually do not get CRE infections. People who are sick or have weakened immune systems are at risk. Patients in intensive care units (ICU) are at greatest risk, especially if they are on ventilators and have central intravenous catheters in place. However, CRE can be found in any health care setting.

What are the symptoms of CRE?

The symptoms of a CRE infection will vary depending on the type and location of the infection. For example, if the bacteria are causing a urinary tract infection (UTI), the signs and symptoms would be that of a UTI.

How is CRE spread?

CRE is most often spread person to person after contact with contaminated wounds or stool. CRE can be transferred from an infected or colonized patient to the environment, medical equipment or to the hands of a health care provider (doctor, nurse, etc.) or visitor. As an example, CRE can be spread when a health care provider touches an infected patient and then touches another patient without washing his/her hands. Good hand washing and cleaning of medical equipment and the environment is very important to stop the spread of CRE.

When and for how long is a person able to spread the disease?

Patients in acute care who have CRE should remain on contact precautions for the duration of the acute care hospitalization. At the present time, we do not know how long colonization with CRE may last; however, colonization is likely to be long term. Even when the patient is home, continuing good hand washing and environmental cleaning is important.

How is a person diagnosed?

A laboratory test can identify if an individual has CRE.

What is the treatment?

Treatment is antibiotics; however, because there are few antibiotics available to treat CRE, they can be difficult to treat. Patients can die from infections with CRE.

Does past infection make a person immune?

No. A person can have a CRE infection more than once.

Should children or others be excluded from child care, school, work or other activities if they have CRE?

If an adult or child has CRE infection, they will most likely be in the hospital and will not be able to be at work or school or attend child care. Good hand washing protocols and routine environmental cleaning should be maintained when the person returns to work, school or child care.

What can be done to prevent the spread of CRE disease?

The greatest risk for acquiring a CRE is in a hospital, especially in an ICU. If you or a family member is hospitalized, you should follow instructions for hand washing and other infection control measures as recommended by the health care facility. You should also expect your nurse and other care providers to wash their hands and wear gloves and a protective gown if necessary. If you have questions, talk with your physician. Once home, good hand washing and environmental cleaning should be followed.

Additional Information:

Additional information is available at www.ndhealth.gov/disease or by calling the North Dakota Department of Health at 800.472.2180.

This disease is a reportable condition. As mandated by North Dakota law, any incidence of this disease shall be reported to the North Dakota Department of Health.

Resources:

1. Centers for Disease Control and Prevention (2015). Healthcare Associated Infections. www.cdc.gov/ncidod/dhqp/ar_kp.html.
2. Centers for Disease Control and Prevention (2015). Guidance for Control of Infections with Carbapenem-Resistant or Carbapenemase-Producing *Enterobacteriaceae* in Acute Care Facilities. *Morbidity and Mortality Weekly Report*, 58(10), pp. 256-260. www.cdc.gov/mmwr/preview/mmwrhtml/mm5810a4.htm.
3. Centers for Disease Control and Prevention (2015). Public Health update of Carbapenem-Resistant *Enterobacteriaceae* (CRE) producing metallo-beta-lactamases (NDM, VIM, IMP) in the U.S. reported to CDC. www.cdc.gov/HAI/organisms/cre.html.