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# Carbapenem-resistant infections

## Frequently Asked Questions

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### 1. What are carbapenem-resistant infections?

Carbapenem-resistant infections are infections caused by bacteria that are resistant to carbapenem antibiotics. These bacteria are Gram-negative bacteria, usually from the genera known as *Klebsiella*, *Acinetobacter* *Escherichia coli*, but other bacteria are also responsible. Bacteria are highly adaptive organisms. Carbapenem antibiotics are broad-spectrum beta-lactam-type antibiotics that are especially effective against Gram-negative bacteria. Carbapenem antibiotics were introduced in the early 1980s and were seen as the last line of defence against bacteria that had become resistant to multiple other antibiotics. Examples of carbapenem antibiotics include imipenem, meropenem, ertapenem and doripenem. Over time, Gram-negative bacteria developed resistance to carbapenem antibiotics. They have gained the ability to either break down carbapenems with an enzyme, or to prevent the antibiotic from entering its cell or to transport it out of the cell. In this way, carbapenem antibiotics can no longer kill these bacteria. The problem is that now, infections with these Gram-negative bacteria are essentially untreatable.

### 2. What types of infections do carbapenem-resistant bacteria cause?

Organisms resistant to carbapenems can cause a variety of infections. Most commonly, they cause bladder infections, intra-abdominal infections, bacteraemia (when the bacterium infects the blood), pneumonia, and skin and soft tissue (including surgical site) infections. Most of these infections are hospital-acquired but certain organisms may be introduced in community and cause infections in susceptible population. Persons in nursing homes who have frequent admissions to hospital are most at risk.

### 3. Where do carbapenem-resistant infections occur?

Bacteria resistant to carbapenems occur throughout the world in health-care settings, but seem to be more common in middle-income countries where access to antibiotics is common but usage of antibiotics is unrestricted. Carbapenem-resistant infections are presently spread across South Africa and their occurrence is increasing.

### 4. Who can get carbapenem-resistant infections?

Healthy persons are usually not at risk for these infections. Persons who are at risk for infections with carbapenem-resistant organisms are those who have severe illness, surgical patients, long-term hospital-stay patients, persons undergoing organ or stem cell

transplantation, persons in intensive care and those who are on mechanical ventilation. Although less common, persons can also be infected from the community.

**5. How do carbapenem-resistant infections spread?**

Carbapenem –resistant infections can be spread from person-to person through being touched by someone carrying the organisms on their hands, or when medical instruments (like ventilators or catheters) contaminated with the organisms are used on them. Sometimes bacteria may transfer their genes that code for resistance to other bacteria. Sometimes resistant organisms can be newly created when antibiotics are overused.

**6. What are the signs and symptoms of carbapenem-resistant infections?**

Clinical symptoms of infections caused by carbapenem-resistant bacteria are identical to symptoms caused by bacteria that are not resistant to carbapenem antibiotics, and depend on the site of infection.

**7. What are the complications of carbapenem-resistant infections?**

Persons with these infections are usually already weakened from other underlying conditions, so untreatable carbapenem-resistant infections may lead to death in some cases.

**8. How are carbapenem-resistant infections diagnosed?**

It is important to diagnose these infections early so that as best treatment as possible can be given, and so that health care workers can observing strict infection control and prevent these infections from spreading to other persons.

**9. How are carbapenem-resistant infections treated?**

A limited range of antibiotics can be used to treat carbapenem-resistant infections. These include colistin, tigecycline and aminoglycosides. Unfortunately these antibiotics are often not very potent (strong) and sometimes they have side effects. In most cases combination treatment is recommended.

**10. How can carbapenem-resistant infections be prevented?**

Careful use of antibiotics in hospital facilities is essential, so that resistance to antibiotics does not develop, and so that the hospital environment does not ‘select’ for resistant organisms. Infection prevention and control practices, including good hand hygiene, should be encouraged for all healthcare workers and patients.

**11. Where can I find out more information?**

For clinical or medical enquiries call the NICD Hotline Tel: +27 82 883 9920 (for use by healthcare professionals only) or the Centre for Opportunistic, Tropical and Hospital Infections, National Institute for Communicable Diseases (NICD) Tel: +27 11 386 6278