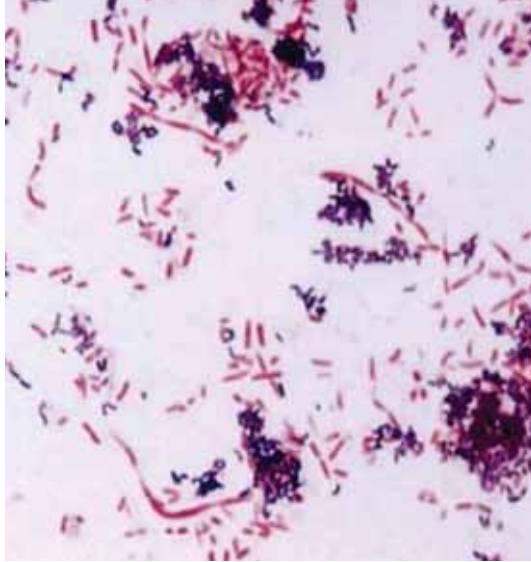


JUST THE FACTS



# ENTEROBACTER

for the health care provider

## WHAT ARE... Enterobacter?

Enterobacter are gram-negative bacteria found in the environment, on human skin, and in our intestinal tract. While many are harmless, several species are opportunistic pathogens present in hospital settings. The most common pathogenic species are *E. cloacae* and *E. aerogenes*. Although enterobacter rarely infect healthy people, they can cause significant morbidity and mortality in immunocompromised patients. Enterobacter, similar to other gram-negative bacteria like salmonella and *E. coli*, produce an endotoxin that causes inflammation.

### Why are enterobacter a concern?

Infections caused by enterobacter bacteria are a concern because they are increasingly common and are often caused by antibiotic resistant strains. Between 5% and 15% of hospital in-patients develop an infection during their admission and patients in an intensive care unit (ICU) are 5 to 10 times more likely to get a hospital acquired infection than those in general wards (Lim and Webb, 2005). Of these infections, enterobacter represent 6% of all hospital-acquired isolates and 11% of all pneumonia isolates. They are the most frequently isolated gram-negative organisms in intensive care unit (ICU) bloodstream infections and they are the third most common pathogen isolated in cases of ICU pneumonias.

Because of their prevalence and pathogenesis, antibiotic resistance in this bacterium is particularly alarming. Recent studies have found that 35 - 50% of Enterobacter involved in nosocomial infections are resistant to second and third generation cephalosporins and broad spectrum penicillins. The rates are much lower for fourth generation cephalosporins and carbapenems, but are increasing (Goossens, 2005). These rates are significant because infections caused by resistant organisms are thought to result in higher morbidity and mortality, prolonged hospitalization, and increased costs compared with infections caused by sensitive strains.

### What are the symptoms?

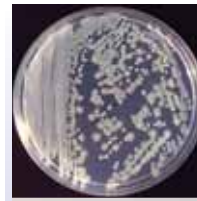
Symptoms of enterobacter infections are not specific to the bacteria and present as other gram-negative bacilli infections.

The urinary and respiratory tracts are the most common sites of enterobacter infection. However, these bacteria can cause infections at many different sites, such as:

- The lower respiratory tract
- Skin
- Soft tissue
- Urinary tract
- Heart
- Bone
- Joint
- Intra-abdomen

### How is an enterobacter infection treated?

Antimicrobial therapy is indicated in virtually all infections caused by enterobacter. However, there is concern over the levels of resistance of these bacteria to a number of antibiotics. Second and third generation cephalosporins and broad spectrum penicillins shouldn't be used to treat confirmed enterobacter infection, regardless of the apparent in-vitro susceptibility. Carbapenems are therefore the current antibiotics of choice to treat enterobacter infections.



## Who is at risk?

Patients are most susceptible to enterobacter infections if they stay in the hospital, especially the ICU, for extended periods. Patients under the age of 2 and over the age of 65 are especially susceptible to infection.

### *Other risk factors include:*

- Prior use of antimicrobial agents.
- Underlying diseases.
- Ulcers of the upper gastrointestinal tract.
- Presence of intravenous catheters.
- Serious conditions such as burns or mechanical ventilation.
- Immunosuppression.

## How are enterobacter infections spread?

Enterobacter are spread like other gram-negative bacteria, such as salmonella. This means that they spread through contact with the bacteria on patients, contaminated surfaces, and medical equipment. Once a health care worker gets the bacteria on his/her hands, it then spreads to patients and other contact items.

The spread of pathogenic bacteria in health care facilities can be stopped. It's every health care worker's responsibility to always follow basic infection control procedures. This should be done with all patients at all times, regardless of diagnosis or infectious status.

## What can I do to stop the spread?

Infection control procedures are critical to control the spread of pathogenic bacteria. These procedures must be followed at all times and are essential to provide a high level of protection to patients, health care workers, and visitors.

### *Standard infection control measures:*

- Wash your hands and use hand-sanitizers thoroughly, regularly, and often.
- Practice good hand hygiene.
- Use personal protective equipment when handling blood, body substances, excretions, and secretions.
- Handle patient care equipment and soiled linen with care in order to prevent exposure to skin, clothing, and other objects.
- Always handle waste appropriately.
- Know and follow infection control guidelines of your facility.
- Move and transport patients only for essential purposes.

*The best and most effective infection control measure is simple and easy to do.*

*Wash your hands thoroughly, regularly, and often.*

## FYI for your information

Catheters and other invasive devices are the # 1 exogenous cause of hospital-onset infections.

### *What you can do:*

- Use catheters only when essential.
- Make sure the right catheter is used.
- Follow proper insertion and catheter-care protocols.
- Remove catheters when no longer essential.

## For more information.

For a detailed description of infection control procedures check with your infection control specialist and the World Health Organization guidelines for infection control in health care facilities at [www.wpro.who.int/sars/docs/practicalguidelines](http://www.wpro.who.int/sars/docs/practicalguidelines).

### References:

- Conly, J. (2002). Antimicrobial resistance in Canada. *Canadian Medical Association Journal*, 167, 885-91.
- Goossens, H. (2005). European status of resistance in nosocomial infections. *Chemotherapy* 26, 177-181.
- Health Canada. (2001). Office of laboratory security data sheet - infectious substances: *Enterobacter spp.* Retrieved on March 11, 2008 from <http://www.phac-aspc.gc.ca/msds-ftss/msds59e.html>
- Lim, SM, Webb, SA. (2005). Nosocomial bacterial infections in Intensive Care Units I: organisms and mechanisms of antibiotic resistance. *Anaesthesia*, 60,887-902.