

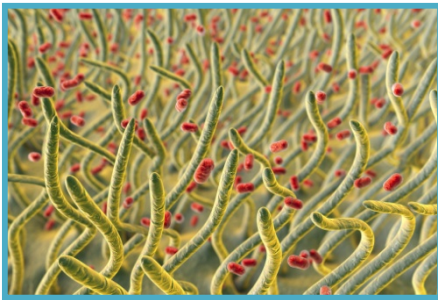
Klebsiella pneumoniae Fact Sheet

Antibiotic-resistant *Klebsiella pneumoniae* is now one of the most common nosocomial pathogens and is intrinsically resistant to many common antibiotics. Given this bacteria's inherent resistance to most antibiotics, it has led to many infections becoming untreatable.

General Information

Bacteriology

Klebsiella pneumoniae is a gram-negative, facultative anaerobe, meaning it can survive in oxygenic or anoxic conditions. It is a non-motile, lactose fermenting, rod-shaped bacteria surrounded by a capsule that helps to increase its virulence and protects it from desiccation. *Klebsiella pneumoniae* is normally present in the human intestines, and feces without causing disease. Some resistant forms of *Klebsiella pneumoniae* are able to produce an enzyme known as a carbapenemase which makes them resistant to the class of antibiotics called carbapenems. Unfortunately, carbapenem antibiotics are often the last line of defense against Gram-negative infections like *Klebsiella pneumoniae*.



Epidemiology of transmission

Klebsiella pneumoniae is spread through person-to-person contact, or less commonly by environmental contamination. In healthcare settings, patients may also be exposed to *Klebsiella pneumoniae* when they are on ventilators, or have intravenous catheters or wounds.

Antibiotic exposure plays an important role in the transmission of *Klebsiella pneumoniae*. People who have been previously treated with antibiotics are at the highest risk for developing this infection.

Clinical manifestations

The most common healthcare-associated infections caused by *Klebsiella pneumoniae* include pneumonia, bloodstream infections, wound or surgical site infections, and meningitis. Patients who require devices like ventilators, intravenous catheters and those taking broad-spectrum antibiotics are most at risk for *Klebsiella* infections. Antibiotic treatment puts patients at an even high risk for infection because of the already disrupted normal flora of the bacteria in the body, making them more susceptible to pathogens.

If a patient has been diagnosed with a *Klebsiella*-related illness, they must follow the treatment regimen prescribed by the healthcare provider. If an antibiotic is prescribed, patients must take it exactly as the healthcare provider has instructed. Patients must complete the prescribed course of medication, even if symptoms are gone.

Basic Prevention

Hand hygiene is of the utmost importance for the elimination of antibiotic-resistant *Klebsiella pneumoniae* transmission. Hands should always be washed thoroughly after using the bathroom and before preparing food as well as after contact with persons who have a *Klebsiella* infection. Alcohol-based hand sanitizers containing $\geq 62\%$ ethanol may be helpful in addition to routine hand hygiene but should be used as a replacement for washing with soap and water.



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Infection Prevention and Control Measures

Healthcare Prevention Measures

In addition to Routine / Standard Precautions, Contact Precautions should be implemented with patients who are suspected or confirmed to have an antibiotic-resistant *Klebsiella pneumoniae* infection:

- Patients with suspected or confirmed *Klebsiella pneumoniae* may be placed in private rooms or cohort with other patients with the same infection.
- Follow hand-hygiene guidelines by either carefully washing hands with soap and water or using Alcohol-Based Hand Sanitizers (ABHS) after contact with infected patients.
- Use gowns and gloves when in contact with, or caring for patients who are symptomatic with *Klebsiella pneumoniae* for all interactions that may involve contact with the patient or potentially contaminated areas in the patient's environment.
- Dedicated equipment for patient care should be utilized whenever possible (disposable stethoscopes, thermometers, BP cuffs, etc).
- Limit the type and amount of supplies entering the room and dispose of all unused items at patient discharge

Environmental Control Measures

Klebsiella pneumoniae can grow well on environmental surfaces as well as surface water, sewage, soil, and on plants, where they can survive for extended periods of time.

Hospital-grade cleaning and disinfecting agents are sufficient for environmental cleaning of surfaces suspected to be contaminated with antibiotic-resistant *Klebsiella pneumoniae*. All horizontal and frequently touched surfaces should be cleaned twice daily and when soiled. The healthcare organization's terminal cleaning protocol for cleaning of the patient's room following discharge, transfer or discontinuation of Contact Precautions should be followed. All patient care equipment (e.g., thermometers, blood pressure cuff, pulse oximeter, etc.) should be dedicated to the use of one patient. All patient care equipment should be cleaned and disinfected as per Routine / Standard Practices before reuse with another patient or a single use device should be used and discarded in a waste receptacle after use. Toys, electronic games or personal effects should not be shared by patients.

References:

1. *Klebsiella pneumoniae* in Healthcare Settings <https://www.cdc.gov/HAI/organisms/klebsiella/klebsiella.html>
2. *Klebsiella pneumoniae* Antimicrobial Drug Resistance https://wwwnc.cdc.gov/eid/article/19/1/12-0310_article
3. Pathogen Safety Data Sheet <http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/klebsiella-eng.php>

