

# Klebsiella Pneumoniae: a Patient Guide

## What is *Klebsiella pneumoniae*?

*Klebsiella pneumoniae* is a type of bacteria usually found in the **gut** and **airways** of humans. Most bacteria can live within our body without causing any harm, but some can go on to cause **infection**.

Some *K. pneumoniae* can become **resistant** to the antibiotics usually used to eradicate them.

## Extended-spectrum beta-lactamases

Extended-spectrum beta-lactamases (ESBLs) are a group of over 200 chemicals called **enzymes** produced by some bacteria, including *K. pneumoniae*. These enzymes can stop the actions of some **antibiotics**, making infections much more difficult to treat.

## Carbapenem-resistant *K. pneumoniae*

Some *K. pneumoniae* bacteria have begun to produce very powerful ESBL enzymes to become '**carbapenem resistant *K. pneumoniae***' (CRKP) which can stop some of the carbapenem antibiotics dealing effectively with the infection.

Carbapenem antibiotics are usually reserved for the most severe infections, so CRKP infections are much more difficult to treat than normal *K. pneumoniae* infections and can therefore be **life threatening**.



*Klebsiella pneumoniae* spreads through contact, meaning anyone with the bacteria on their skin can easily spread it to others through person-to-person contact, even if they are not infected. Spread of this bacteria is also linked to medical devices like ventilators and catheters.

## Who is at risk of *K. pneumoniae* infection?

### Patients with Pre-Existing Conditions

Those with a **weakened immune system** can find themselves unable to fight off the infection, including people who already have medical conditions such as:

- Diabetes
- Alcoholism
- Chronic liver disease
- Lung disease
- Chronic obstructive pulmonary disease (COPD)
- Kidney failure (with or without the use of dialysis).

### Vulnerable Patients

The people who are more vulnerable to picking up infection due to *K. pneumoniae* includes:

- **Cancer** patients and those receiving **chemotherapy**
- Solid **organ** and **stem cell** transplant donors and recipients
- **Hospital patients** in general as well as those requiring **surgery**
- People already taking **antibiotics** or **corticosteroids**
- **Young** children and **older** people
- Patients assisted with **medical devices** such as **ventilators** (to help people breathe) and urinary or intravenous **catheters** (to remove or give fluids)
- People who stay in hospital or an **intensive care unit (ICU)** setting for long periods of time.

## What infections can be caused by *K. pneumoniae*?

Since *K. pneumoniae* can live in a variety of locations within the body, they can cause several types of infections in different areas.

### Common *K. pneumoniae* infections

#### Urinary Tract Infections (UTIs)

- Urinary tract infections are caused by bacteria entering the urinary tract, which includes the parts of the body involved in producing urine. These infections are very common among **older women**.
- UTIs can be symptomless but can also cause symptoms such as a frequent urge to urinate, lower abdominal discomfort, pain when urinating with cloudy or bloody, strong smelling urine in small amounts and back or pelvic pain. More severe infections could cause fever, chills, nausea and vomiting.

#### Skin Infections

- These are caused by bacteria entering the body through a break in the skin, often at wounds or surgical sites.
- Symptoms can include fever, swelling, redness, pain and fatigue that may appear as flu-like symptoms.

#### Respiratory Tract Infections

- **Bacterial pneumonia** is a lung infection caused by bacteria entering the respiratory tract.
- Patients may experience a **cough, fever, sharp chest pain** and shortness of breath with a 'currant jelly'-like **phlegm**. Around half of these *K. pneumoniae* lung infections result in bacteria getting into the **bloodstream** and can therefore be **life threatening**. On rare occasions *K. pneumoniae* infections cause **lung abscesses**.



### Other *K. pneumoniae* infections

#### Bacteraemia

- This is a general term for the presence of **bacteria** in the **blood**.
- Untreated bacteraemia can cause **sepsis**, which is the body's response to an infection as the immune system goes into overdrive. Sepsis is a **medical emergency** that can be **fatal**.

#### Meningitis

- Very rarely, *K. pneumoniae* causes **bacterial meningitis**, an inflammation of the **membranes** that surround the **brain** and **spinal cord**.
- Most cases occur in a **hospital** setting and cause a sudden onset of **high fever, headache** and a **stiff neck** as well as **nausea, vomiting, confusion** and **light sensitivity**.

#### Pyogenic Liver Abscesses

- *K. pneumoniae* infection of the **liver** can create pus-filled **lesions** which commonly affect people with **diabetes** and those taking long-term **antibiotics**.
- Abscesses cause **fever, pain** in the upper abdomen, **nausea, vomiting** and **diarrhoea**.



*Klebsiella Pneumoniae can live in a variety of locations within the body and can cause several infections. The most common of these are urinary tract infections, skin infections and respiratory tract infections.*

## How can *K. pneumoniae* infections be prevented?

- Since *K. pneumoniae* is passed from person to person, it means that limiting **physical contact** and ensuring good **hand hygiene** is essential to preventing infection.
- Good hand hygiene means making sure to wash your hands with soap for **at least 20 seconds** after using the bathroom, coughing or sneezing, before touching your eyes, nose or mouth and both before and after working with food, or dressing wounds on the body.
- **Those patients who are more vulnerable to infection or with weakened immune systems should discuss further prevention methods with their doctor.**

## How are *K. pneumoniae* infections diagnosed?

Depending on the symptoms presented, doctors will use a variety of **tests** to diagnose a *K. pneumoniae* infection.

Doctors may complete **physical examinations** for obvious signs of infection, take **fluid samples** to check for the presence of bacteria, or use **imaging tests** like **scans** to check for **physical signs** of pneumonia or a **liver abscess**.



## How are *K. pneumoniae* infections treated?

- *K. pneumoniae* infections that don't show any signs of **resistance** to antibiotics, can usually be treated with a course of **antibiotics** as recommended by your doctor.
- The resistance to antibiotics shown by **CRKP** infections means that there are **limited antibiotic treatments available**. However, there are still some options which can treat CRKP infections, including antibiotics like **fosfomycin**, **aminoglycosides**, **tigecycline** and **carbapenems**.
- **It is important to follow your doctor's advice, whatever treatment plan they advise you to follow.**

*Limiting physical contact and ensuring good hand hygiene is essential to preventing infection. It is important to follow your doctor's advice, whatever treatment plan they advise you to follow.*

## How can antibiotic-resistant *K. pneumoniae* infections affect me?

A serious infection can unfortunately leave **lasting effects** and a better recovery is likely when the infection is **diagnosed** and then **treated** as **early** as possible.

Another important factor in making a good recovery is to **take all the prescribed antibiotics correctly**, and by following doctors' advice over the weeks or even months that it could take to recover.

[www.antibioticresearch.org.uk](http://www.antibioticresearch.org.uk)

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