

Microbe of the month

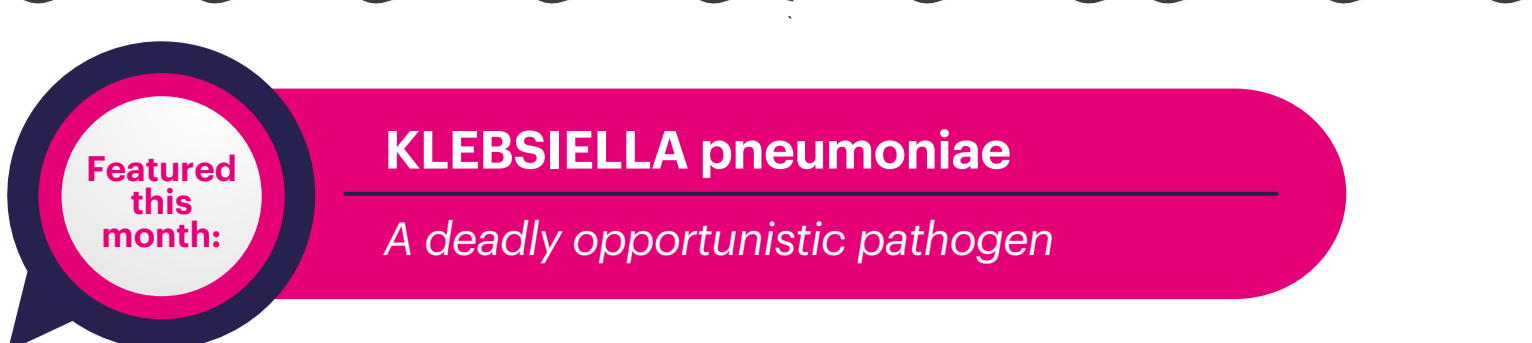
Breaking The Chain of Infection

Cutimed®

MARCH 2022 NEWSLETTER

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Featured this month: **KLEBSIELLA pneumoniae** *A deadly opportunistic pathogen*

Hello readers!

Welcome to the second issue for 2022, which looks at the important **opportunistic pathogen** *Klebsiella pneumoniae* [*Kleb-see-ell-uh nyoo-mow-nee-ai*], which is responsible for numerous types of healthcare-associated infections (HAIs) and associated deaths.

The aim of the Microbe of the Month newsletter is to help create awareness about microorganisms of clinical importance in healthcare today, in an easy to read and understand format. Each newsletter explores the origin and epidemiology of specific bacteria, viruses or fungi (i.e., the infections they may cause and their modes of transmission) and highlights the measures which should be taken to limit their spread.

Please use this newsletter as a teaching tool in your workplace, share it widely with colleagues and start an infectious dialogue about topical issues in infection control!

***Klebsiella pneumoniae* was first isolated in the late 19th century and was originally known as 'Friedlander's bacterium'.¹**

The bacterial capsule inhibits phagocytosis by leukocytes – this is an important defence or virulence mechanism to evade the immune system.²

The laboratory 'string test' illustrating the typically mucoid colonies of *K. pneumoniae* on a McConeyk agar plate (a string of 5mm or longer is defined as positive).³

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MORE ABOUT KLEBSIELLA BACILLI^{1,2,4,6,7}

Klebsiella are encapsulated Gram-negative bacteria, capable of both aerobic and anaerobic respiration. They are part of the normal human intestinal flora (also known as commensal or resident flora, where they do not cause disease) and occur widely in the environment in soil and water.

In the healthcare setting, *Klebsiella pneumoniae* (*K. pneumoniae*) causes a variety of infections in people of all age groups – especially premature infants, the elderly, immunocompromised individuals, and alcoholics – particularly with exposure to broad spectrum antibiotic therapy, and where invasive catheters and devices are present. Colonisation with *K. pneumoniae* may be difficult to distinguish from infection when making a diagnosis.

The range of infections includes pneumonia (it is a frequent cause of ventilator-associated pneumonia), surgical site infection, urinary tract infection, bloodstream infection, meningitis, and liver abscesses. Although *K. pneumoniae* accounts for a smaller percentage of pneumonia cases, the case fatality rates are high (up to 90% in untreated cases).

The characteristic appearance of mucoid "red currant jelly" sputum in pneumonia caused by *Klebsiella pneumoniae*.⁴

K. pneumoniae is now a major threat to public health because it has developed antimicrobial resistance (AMR) to all commonly-used **beta-lactam antibiotics** and to other classes of antibiotics including **carbapenems**, which are often a last resort for the treatment of *K. pneumoniae* infections in critically-ill patients.^{4,6,7,8,9}

Please refer to **Microbe of the Month July 2019**¹⁰ 'Understanding carbapenem-resistant Enterobacteriaceae' (CRE) for more information on this topic.

How is *Klebsiella pneumoniae* spread?^{5,6,7}

This bacterium is spread through person-to-person contact (e.g., the contaminated hands of healthcare or other personnel), or indirectly via contaminated environmental surfaces and equipment. These bacteria are not spread via the airborne route.

- ✓ **Standard and contact precautions** are a fundamental component of the infection prevention and control measures necessary to control healthcare-associated infections (HAIs).
- ✓ **Hand hygiene before and after every patient contact** is the cornerstone of standard and contact precautions.
- ✓ **Wear appropriate PPE** (gloves, visors and disposable plastic aprons) for procedures where exposure to invasive devices, body fluids, soiled linen or healthcare risk waste is anticipated.

For this reason, patients should also be reminded to clean their hands often, including:

- ✓ Before preparing or eating food
- ✓ Before touching their eyes, nose or mouth
- ✓ Before and after changing wound dressings or bandages
- ✓ After using the toilet
- ✓ After blowing their nose, coughing or sneezing
- ✓ After touching hospital surfaces such as bed rails, bedside tables, doorknobs, remote controls or the telephone

THE BOTTOM LINE...

2,4,5,6,7,8,9

- ✓ Healthy individuals do not usually acquire infections with *K. pneumoniae*.
- ✓ Patients hospitalised for extended periods - usually in an ICU, treated with invasive devices such as catheters, ventilators and broad-spectrum antibiotics - are at highest risk.
- ✓ Other risk factors include organ transplants, renal failure, diabetes mellitus and patients in long-term care and frail aged nursing homes.
- ✓ Minimise furniture and designate patient care equipment for use on that patient only. Use disposable supplies where possible.
- ✓ Ensure that patient care equipment is properly cleaned and disinfected prior to re-use on another patient.
- ✓ Wash hands promptly after contact with infective material, and always after glove removal.
- ✓ Apply alcohol-based hand rub frequently during tasks when hands are not visibly soiled, and after touching a patient, their environment or their possessions.
- ✓ Wear gloves when in contact with blood, body fluids, secretions, mucous membranes and contaminated items such as drainage tubes.
- ✓ Avoid the use of invasive devices where possible, and practice strict aseptic technique for their insertion and after-care.
- ✓ Bathe ICU patients (and those with invasive devices, e.g., central lines) with chlorhexidine gluconate antiseptic liquid soap daily.
- ✓ Handle used and soiled linen carefully. Use yellow plastic bags for isolated patients and keep the bags inside the room.
- ✓ Dispose of healthcare risk waste (HCRW) carefully – use disposable HCRW containers where possible (including sharps bins); these are also to be kept inside the room for isolated patients.
- ✓ Yellow linen bags and waste containers should be collected from the isolation room directly (and not stored in the sluice room).
- ✓ Clean and disinfect environmental surfaces with a sodium hypochlorite-based detergent cleaner, using colour-coded cloths and cleaning equipment. Frequently touched surfaces, e.g., cot sides, lockers, monitors, light switches etc., should be cleaned and disinfected at least twice daily.
- ✓ There is no need for visiting restrictions; however, visitors should wash their hands with soap and water upon entry and exit.

Your 5 Moments for Hand Hygiene

- 1 BEFORE TOUCHING A PATIENT
- 2 BEFORE CLEAN / ASEPTIC PROCEDURE
- 3 AFTER BODY FLUID EXPOSURE RISK
- 4 AFTER TOUCHING A PATIENT
- 5 AFTER TOUCHING PATIENT SURROUNDINGS

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An infected and colonised wound.

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¹Starinowski J, Szironi M, Kondrowski K, et al (2018) Randomized controlled trial evaluating daily carbonyl chloride impregnated dressings for the prevention of surgical site infections in adult women undergoing caesarean section. *Surg Infect (Lancet)* 17(14): 427-35

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³Cutting K, Maguire J (2015) Safe bioburden management: A clinical review of DACC technology. *Journal of Wound Care* Vol 24, No 5

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