**Science**

Klebsiella, represented in the this story by Kev, is a bacteria which normally lives in the bowel with other bacteria, including E.coli. Klebsiella, and other bacteria like Enterobacter and Serratia are all similar to E.coli, and each other, in the type of infections they cause. Collectively, as they all live in the colon they are all called coliforms-colonic forms of bacteria. When patients are treated with antibiotics orally or intravenously, they will reach the bowel lumen where they may be able to kill coliforms.

Klebsiella are better able to share plasmids with antibiotic resistance genes than *E. coli*, and so are normally more antibiotic resistant then *E. coli*.

Bacteria without these resistance genes may be killed by antibiotics. Antibiotics may therefore reduce the diversity of the intestinal microbiome, but those bacteria that are resistant will increase their numbers. Sometimes the intestinal bacteria may consist of only a few species, as opposed to the > 1000 species normally found.

Antibiotics cause antibiotic associated diarrhoea, thought to be caused by a change in the microbiome and a change in the metabolite composition of the bowel. Bacteria from patients with diarrhoea will be found in the toilet, the environment, and on the skin e.g. hands or perineum.

While Klebsiella are able to cause UTIs like E.coli, they can both also cause pneumonia. Particularly in patients in hospital. Klebsiella may first colonise the skin and oropharynx before being aspirated into the lung and causing pneumonia. Coliform bacteria are killed by drying as would happen on skin, particularly when exposed to sunlight. This is why coliforms are not normally found on the skin. When they do live on the skin they like to live in moist areas e.g. groins and armpits.

When antibiotics are not working to treat a patient’s infection, obtaining samples for microbiological testing is needed to find out which pathogen is causing the infection, and, by antibiotic susceptibility testing, which antibiotics will be effective. Patients found to be colonised with anti-microbial resistant coliforms will be highlighted and extra measures e.g. single room isolation, will be used to prevent spread to other patients when in hospital.

Anti-microbial resistant coliforms have been increasingly found to be resident in hospital water systems e.g. sink basins and shower basins. This will happen when patients wash hands and have showers. If sinks/showers become blocked, then the bacteria may splash from the sink/shower drain and spread to new patients.