



‘Highly resistant bugs’ – antibiotic resistance and Carbapenemase-producing Enterobacteriaceae (CPE): information for families

This information sheet from Great Ormond Street Hospital (GOSH) explains about antibiotic resistance and Carbapenemase-producing Enterobacteriaceae (CPE) bacteria and why this has become a worldwide public health issue. It explains how these organisms are passed on and what we are doing at GOSH to reduce the chance of them spreading.

Bacteria are tiny living beings (microorganisms, also commonly called bugs or germs). The human body contains huge amounts of ‘friendly’ bacteria that are either neutral or beneficial for us. They can help strengthen the immune system, secrete vitamins that benefit the health of the human body, and the ones that live in the gut help to digest food. Friendly bacteria also protect us from dangerous bacteria by occupying places in the body the types of bacteria that can cause disease want to attach to.

What are antibiotics?

Antibiotics are types of medications that destroy or slow down the growth of bacteria. Antibiotics are used to treat infections caused by bacteria, they do not work against viral or fungal infections.

What is antibiotic resistance?

Antibiotic resistance is present in a bacterium when an antibiotic no longer has the ability to effectively control or kill it. This means that the bacteria have become ‘resistant’ to the antibiotic and continue to multiply even though there is a sufficient dose of antibiotic in the body.

How do bacteria become resistant to antibiotics?

Some bacteria are naturally resistant to some antibiotics and others have become resistant through selection of those with genetic changes due to use of the antibiotic. Some resistances can be passed from one bacterium to another, spreading resistance between different types of bacteria.

What are Carbapenemase-producing Enterobacteriaceae (CPE)?

Enterobacteriaceae are bacteria that usually live harmlessly in our gut. This is called ‘colonisation’ and does not usually cause any problems.

However, if the bacteria get into the wrong place, such as a wound or the bloodstream, they can cause infection. Carbapenems are one of the most powerful types of antibiotics. Carbapenemases are enzymes (chemicals) made by some strains of these bacteria which allow them to destroy carbapenem antibiotics. This means we say the bacteria are resistant to the antibiotics. These bacteria are sometimes also called ‘superbugs’.

Colonisation and infection

A person can be either 'colonised' or 'infected' with a CPE.

- 'Colonised' means that a person has the bacteria present on the skin, in body openings or in the gut, but has no signs of infection.
- 'Infected' means that a person has signs of an infection, such as fever or pus from a wound.

In our program to control the risk from CPE, both colonisation and infection are important as the situation could lead to further spread of the organism and colonisation may be followed by infection.

The medical team caring for your child will discuss with you which applies to your child.

Why should I be concerned about antibiotic resistance?

Antibiotic resistance has emerged as one of the most pressing public health concerns. Almost every type of bacteria has become less responsive to antibiotic treatment. If a bacterium is resistant to many antibiotics, treating the infections it causes can become difficult or even impossible. Someone who is colonised or infected with a CPE can pass this on to another person. In this way, difficult to treat infections can spread from person to person.

How will I know if my child has a CPE?

There is no way of telling if someone has a CPE or not by just looking. The most reliable way of diagnosing a CPE is by taking a faeces (poo) sample, a sample of other body fluids, such as sputum or urine, or nose and throat swabs.

At GOSH, we ask for a poo sample from all children and young people admitted to the

hospital, as CPE are most commonly found in the gut.

The sample is sent to the microbiology laboratory to see whether any antibiotic resistant bacteria are present. If any bacteria are found, the laboratory staff will then do further test to work out the type of bacteria and the antibiotics to which it is resistant. At GOSH, the results of these tests are usually available within three to four days.

How does someone get colonised or infected with a CPE?

CPE may develop in the body following the use of antibiotics or can be acquired from someone else.

Any child, young person or family member, as well as staff, may be colonised with CPE, especially if they have been in hospital.

The most common way of spreading the bacteria is by contact. This can occur through contact with the hands from person-to-person. It can also occur through contact with objects such as equipment or toys that have not been cleaned properly. If your child has been in hospital or has had antibiotics recently, they are more likely to become colonised with a CPE than other children.

Frequent hand washing or the use of alcohol gel and keeping the environment clean is the most important way to prevent the spread of a CPE.

What happens if my child is found to have a CPE?

If your child is colonised with a CPE, it is unlikely that they will experience any ill-effects or symptoms.

If your child is infected with a CPE the medical team caring for your child will discuss the treatment with you.

However, because both colonised and infected patients can spread the bacteria to other patients

we will need to take special precautions to reduce the risk:

- We will nurse your child in a separate room.
- We will use additional precautions, such as wearing gloves and aprons or gowns.
- We will also put an alert on your child's computer record to indicate that they require a separate room when coming to GOSH. This may impact on the timing of appointments or investigations, but your child will not be cancelled just because of this alert.

Do we need to take any precautions at home or at school?

In normal life, these organisms are not usually a concern and there are no additional things you need to do at home or school. We always recommend good basic hygiene, such as hand washing before eating and after going to the toilet, and using separate towels. There is usually no need to inform anyone that your child has or has had a CPE. The only circumstances where you might consider telling your child's school is if there are other pupils who may need to go into hospital regularly.

What if my child is seen at a hospital other than GOSH?

If your child is seen at a hospital other than GOSH, it is important that you make the health care staff aware that your child was found to have CPE and show them the letter we sent you. If anyone else in the family needs to go to hospital, you should let staff there know too.

What happens if my child has an infection?

Antibiotics are commonly used to treat infections, however if someone is known to be colonised

with CPE the standard choices of antibiotics may need to be altered. Because As CPE are known to be resistant to many antibiotics, less commonly used agents may be needed to ensure an infection is treated effectively. It is therefore important that your healthcare team know about the CPE so that they can decide on the best treatment.

When will my child be free from CPE?

As these bacteria can live harmlessly in the gut for long periods it is difficult to know when they are no longer present.

At GOSH, we declare a child free from CPE if they meet the following criteria:

- They have not received antibiotics in the previous six months.
- They have three negative poo specimens taken one week apart. The last sample must be taken in or after the fifth month of the period where no antibiotics were given. If the CPE was isolated from another area or sample, such as urine or sputum, then three specimens of urine or sputum would need to be negative, as well as three poo samples.
- They are not immuno-suppressed.

If we declare your child free from CPE, the alert from your child's computer record will be removed.

What is GOSH doing to prevent the spread of CPE?

GOSH has been working hard for a number of years to reduce the spread of CPE and other antibiotic resistant bacteria. We screen every child that is admitted for CPE so that we can put in place our control plans. We have low numbers of children with CPE and when each case is checked, in most cases, the children have developed CPE before they come to GOSH.

We strongly encourage hand washing before and after patient contact, by providing alcohol hand rub (an alternative to soap and water) at the entrances to each ward. We encourage you to ask any member of staff who visits your child whether they have washed their hands.

Finally, we are working with our cleaning contractors to improve levels of cleanliness in wards and general areas but we need your help too. There are posters and information leaflets in every ward about how you can help us keep the hospital clean.

Further Information

Please ask for a copy of our infection prevention and control information sheet, which explains what the Infection Control Team are doing to prevent hospital infections and what you can do to help us to minimise the risk of infections during your child's stay. A copy is also available in the ward information folder in the parents' sitting room or on the bedside television system.

If you have any questions, please ask your nurse to contact the ward infection control link nurse or speak to the nurse in charge.