ECMO Parent Information Leaflet
Paediatric Intensive Care Unit,
Freeman Hospital, Newcastle upon Tyne

Introduction

This information leaflet aims to provide you with some information about ECMO. Your child is very ill and has a problem with their heart and/or lungs. The doctor caring for your child thinks that ECMO can help. More information will be given to you when you and your baby arrive.

Please refer to glossary at the end of the leaflet, to understand terms used.

What is ECMO?

ECMO stands for Extra Corporeal Membrane Oxygenation. Extra Corporeal means “outside the body”. “Membrane Oxygenation” refers to a piece of equipment that delivers oxygen to the blood. The ECMO circuit is a temporary artificial lung and heart machine similar to that used in open heart surgery. ECMO provides oxygen to the organs in the body and rests the lungs and/or heart whilst they recover and repair themselves.

Who needs ECMO?

The lungs are responsible for putting oxygen into the blood, which the heart then pumps around the body to the rest of the organs to keep us alive. ECMO can be used to help a child with severe lung disease that has not responded to the usual treatment of ventilation and medicines, or for children with severe heart failure, either before or following heart surgery. ECMO is a supportive treatment and will only work if your child’s illness is reversible.

How does ECMO work?

- ECMO works by taking blood with little oxygen from the heart through a cannula that is placed in a vein (usually in the neck).
- This blood is pumped through an oxygenator, which acts as an artificial lung.
- The blood now containing oxygen is then warmed and pumped back into the body.
• The blood can be pumped back in through the same tube, or through a second tube in the neck that is placed in the artery. In this case the pump acts as an artificial heart.
• This ECMO process is continuous.
• Insertion of the cannulae requires a short operation on the intensive care unit. An anaesthetic is given to ensure your child does not feel any pain.

Types of ECMO

• VA ECMO (Veno-Arterial): A cannula is placed into both an artery and a vein, providing support for both the heart and lungs

• VV ECMO (Veno-Venous): A single cannula is placed into the vein, providing support for the lungs only. Some children may need to be changed over to VA ECMO if their heart is not pumping well.

What are the risks?

A child that needs ECMO is very ill, and without it, would normally die. The benefits of ECMO are therefore greater than the risks, but it is a balance between the two.

• Bleeding: We have to prevent clots from forming in the circuit and therefore have to thin your child’s blood with a drug called heparin. This can cause bleeding problems elsewhere, for example around the cannula or other line sites.
• Brain damage: This can be caused by bleeding into the brain because of the blood thinning, and can be a problem in newborn babies who are already at risk. Many brain problems are however due to how sick the child has been before ECMO. We will regularly assess your child’s brain function with examination and possibly scans.
• Infection: Can occur because of the tubes in your child, which normally would not be there. We routinely screen for infection in your child and the circuit, and antibiotics are given if needed.
• ECMO circuit failure: Although the ECMO circuit is always checked thoroughly and safety measures are in place, problems can occur. These problems include air bubbles, blood clots, ruptures and failure of the electrical equipment. Any concerns we have will be discussed with you.

What happens when my child is on ECMO? What can I expect?

• Whilst on ECMO your child will remain on a ventilator but at lower settings than before.
• We will also give your child painkillers and sedatives (if needed) to keep them comfortable and sleepy.
The doctors will examine your child everyday and do regular chest x-rays to see whether the lungs are improving.

The doctors may also do scans of the heart (Echo's) to have a look at how well the heart is pumping.

Other tests may be required such as head ultrasound and EEG to assess neurological (brain) function.

Whilst on ECMO we will feed your child via a nasogastric tube unless they are not absorbing their feeds, in which case they will be given nutrition through a vein.

Who will take care of my child?

At any one time we have two nurses looking after ECMO patients. One to look after your child, and one to look after the ECMO circuit. They work closely alongside a regular team of doctors who include anaesthetists, intensivists, cardiothoracic surgeons and cardiologists. Other doctors from this and other hospitals may also be involved in your child’s care depending on their illness. Other people you may see are physiotherapists, occupational therapists and perfusionists (who build the circuits).

How long will my child be on ECMO?

The length of time spent on ECMO can vary greatly and depends on your child’s illness. The average length of ECMO treatment is ten days, but some children need longer. Sometimes it becomes clear that your child’s heart and/or lungs will not get better and therefore ECMO is not helping. In this case the doctors will discuss this with you.

How do we know when your child is ready to come off ECMO?

As your child gets better we expect to see an improvement when we examine them and also in the chest x-ray/echo and blood tests. If this happens we will gradually reduce the support from the ECMO circuit to a low flow. We will then clamp the tubes draining the blood from the heart so that your child’s heart and/or lungs are doing all the work. They will be fully ventilated at this point and may be on medicines to help their heart function. If your Childs condition remains stable for a period of a few hours they will then require a short operation to remove the cannulae.

After ECMO and follow up

After your child has come off ECMO arrangements are made to transfer your child back to a local hospital once they are stable. However, they may still need more time in intensive care before they are recovered. We do not
arrange follow up of our ECMO patients; this will usually be arranged at your local hospital.

Contact

PICU, Freeman Hospital, High Heaton, Newcastle upon Tyne, NE7 7DN
Tel: 0191 2231016 (direct line)
Contact can be made 24 hours a day

Glossary

Cannula/e: The plastic tubes by which blood is taken and returned to the body.
ECHO: Short for echocardiogram. This is a scan of the heart (like a pregnancy scan) to see how well the heart is working.
EEG: Electroencephalogram. This measures electrical activity in the brain and can help detect fits/seizures.
Head Ultrasound: A scan (like a pregnancy scan) of the brain to look for bleeds and extra fluid.
Nasogastric tube: A feeding tube which passes through the nose into the stomach to allow us to feed your child.
Ventilator: A breathing machine that supports the lungs and takes over the work of breathing.

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