

Central lines and arterial lines

This information sheet from Great Ormond Street Hospital (GOSH) explains about central lines and arterial lines and why they might be needed. Children having certain surgical procedures (for example, heart, brain, orthopaedic, or major abdominal surgery) may have a central line or arterial line inserted as part of their anaesthetic. These lines are also used on intensive care units.

Central lines

A central line is a narrow cannula (flexible plastic tube) inserted into a large vein in the neck, upper chest or groin. It may include up to 3 separate channels. It can remain in place for a week or more, if necessary.

Why does my child need a central line?

A central line is an important part of anaesthetic monitoring for some major surgery, and is essential for some operations. It allows us to measure the pressure of blood in the veins, which helps us to know how much fluid to give your child, and to take blood samples without having to use a needle. Certain drugs that can irritate the small veins of the hands and feet need to be given through a large vein.

How is a central line inserted?

The anaesthetist will insert the central line while your child is asleep, but before the surgery starts. We use sterile conditions and look with ultrasound to visualise the vein in which the line is being placed. After insertion, we stitch the line in

position, and cover it with a sterile transparent dressing.

What are the risks?

- **Infection** – we use full sterile precautions in an operating theatre to insert central lines, and the line is closely monitored for any sign of infection, but this may still occur. The line is removed as soon as it is not needed.
- **Accidental removal** – central lines are stitched in place and covered with a dressing, but occasionally the line can be dislodged or accidentally removed. A new line may need to be put in if it is still needed.
- **Blockage** – the nurses looking after a child with a central line are trained in how to use it and flush it to minimise the risk of it blocking, but this can still occasionally happen. If still required, a new line may need to be put in.
- **Bleeding** – we use ultrasound so we can see where the vein is during insertion, but if the line is difficult to insert or if your child's blood does not clot normally there may be bleeding or bruising around the site of insertion.



● **Lung damage** – if the central line is inserted in the neck or upper chest, the lining around the lung and/or the lung itself may be damaged, and the lung may collapse. This is uncommon as we use ultrasound to visualise the vein and minimise this risk, but if this happens, your child may need to have a tube in the chest between their ribs to re-inflate the lung.

● **Blood clot** – the central line may cause a blood clot in the vein. If this happens, the line will be removed and your child may need blood thinning medicine to break down the clot.

● **Changes to the heart rhythm** – the tip of the central line can stimulate the pacemaker cells in the heart to change the rhythm of the heart. This can be a sign that the line is in too far, and usually responds to withdrawal by a short distance.

Line removal

Once the line is no longer required it can be removed on the ward by a nurse. The insertion site will need some gentle pressure applied to it for a few minutes to ensure there is no bleeding. It is no more uncomfortable than having a cannula in the arm removed.

Arterial lines

An arterial line is a small cannula (flexible plastic tube) that we put into an artery in the wrist, arm, groin, or foot.

Why does my child need an arterial line?

An arterial line is essential for certain operations such as heart surgery and is very helpful for many other operations. It helps the anaesthetist to look after your child through very accurate and continuous blood pressure measurement via a monitor, and allows blood samples to be taken easily both during and after surgery. This allows us to adjust the fluids and drugs as needed for your child. The arterial line may be removed in the

recovery ward, or may be left in place for a short period after surgery.

What are the risks?

● **Blockage/stops working** – a continuous trickle of fluid is given through arterial lines to help prevent this, but if this happens while your child still needs an arterial line, a doctor will insert another one.

● **Accidental removal** – occasionally, the line can be dislodged or accidentally removed. A new line may need to be put in if it is still needed.

● **Infection** – arterial lines are inserted after careful cleaning of the skin and are covered with a sterile dressing. The nurses looking after your child will regularly examine the arterial line for any sign of infection, and remove it if necessary.

● **Bleeding** – there may be bruising or bleeding around the insertion site.

● **Blood clot** – a blood clot may form in the artery around the arterial line. This is a rare but serious complication as the part of the body supplied by that artery, such as the hand or leg, may not receive enough blood. The line will be removed and your child may need blood thinning medicine or an operation to try to remove the clot. **Very rarely, the reduced blood supply to the tissues caused by a blood clot in the artery can result in severe damage**, for example in the loss of part or all of the limb.

● **Limb growth** – A very rare complication, later in life, can be slow growth of the limb in which the line was sited. It should be stressed that this is a very rare complication, and rarer still is the need for an operation to help correct a difference in limb length.

Line removal

Once the line is no longer required it can be removed on the ward by a nurse. The insertion site will need some firm pressure applied to it for a few minutes to ensure there is no bleeding. It is no more uncomfortable than having a cannula in your arm removed.

