

# Haemodialysis fistula

This infoKID topic is for parents and carers about children's kidney conditions. Visit [www.infoKID.org.uk](http://www.infoKID.org.uk) to find more topics about conditions, tests & diagnosis, treatments and supporting information.

Each topic starts with an overview followed by several sections with more information.

[Links to sections](#) in topic | [Other topics](#) available on website

**Haemodialysis** is an important treatment for kidney failure – when the kidneys stop working properly. Using a special machine with an 'artificial kidney', haemodialysis removes extra water, salt and waste products from the blood.

Your child will need a procedure to get access to his or her bloodstream for haemodialysis. One option is to create a fistula. This joins two types of blood vessels to make one large, stronger blood vessel – usually at the wrist or elbow.

A fistula needs to be made about 8 weeks before dialysis starts, to allow time for it to develop and get strong enough. For each dialysis session, one or two needles are inserted into the fistula.

For many children, a fistula is the best option for long-term dialysis because there is much less risk of infection or blockage. Occasionally, a fistula fails to develop, or there is bleeding or other complications, and some children need to come back for a new procedure. With a good functioning fistula there is a 'buzzing' feeling in the area, and your child will be shown how to take care of it.



→ For a detailed overview of dialysis, and an introduction of both types, please read the topic [Dialysis](#).

## Overview

### What is it?

An **arteriovenous fistula** (usually shortened to **AV fistula** or **fistula**) can be formed in the arm. It joins two types of blood vessels – an artery (which carries blood from the heart round the body) and a vein (which carries blood back to the heart). This makes one large, stronger blood vessel. The blood carried through the artery can go straight into the vein.

The fistula is usually formed in the arm that your child does not draw or write with. It is one of two places:

- inside of the elbow (a **brachiocephalic fistula** or **brachio basilic fistula**) – usually for younger children
- inside of the wrist (a **radiocephalic fistula**) – usually for older children and adults.

For regular dialysis sessions, two needles are inserted into the fistula – because it is a larger, strong blood vessel, it is

easier to access and remove blood. A special gel or cream can be put on your child's skin to help your child stop feeling any pain when the needles are put in.

Your child may feel a 'buzzing' in the area around the fistula. This is the effect of the blood passing through.

It does, however, have a greater risk of infection or blockage, and needs to be looked after carefully.

### Why is it recommended?

For many children, a fistula is currently the best option for access to the blood when haemodialysis is needed over a long time.

- A fistula is *much* less likely to become infected than a 'line'. This is important because an infection can damage the lining of a blood vessel.

- A fistula also lasts for a longer time than a line. There are only four blood vessels that can be used to create a fistula. If these have all been used to form fistulae, your child may need to use a line instead.

Small children may not be ready for a fistula. They may need to have a **central venous line** for haemodialysis, until they are large enough for a fistula.

### Alternative – central venous line

The alternative to a fistula is a **central venous line**. This is a soft, long, thin tube (catheter) that is placed into one of the large blood vessels in your child's body. This is usually in the neck or chest, or occasionally the groin. It is often called a 'line'.

A **temporary line** can be placed for children who will need haemodialysis quickly or for a short time. For long-term use, a **permanent line** can be placed by surgery. For each dialysis session, tubes are connected to the end(s) of the catheter.

A line may be more suitable for, or preferred by, some children – especially those who are too small for a fistula. It does, however, have a greater risk of infection or blockage, and needs to be looked after carefully.

#### » More about a central venous line – in Haemodialysis

## Creating a fistula

A fistula needs to be made about 8 weeks, or sometimes longer, before haemodialysis starts, to allow time for it to develop and get strong enough.

The procedure takes place at your child's **paediatric renal unit**, a specialised unit for babies, children and young people with kidney conditions, which may be in a different hospital, and is usually done by a surgeon (this may be a **transplant surgeon** or a **vascular surgeon** – who specialises in surgery on blood



Fistula in a child's arm

vessels) or by an interventional radiologist. It usually takes about 2 hours, though your child will probably stay in the hospital for at least one night to recover. You can bring a change of clothes and some toys and books.

### Tests before surgery

Your child may need one of the following imaging tests, to look at his or her blood vessels. This checks whether the blood vessels are too narrow, and helps to select the best vessels to form a fistula. There are a few types of tests, including the following:

- **Venogram**: in this type of **X-ray test**, a special dye is injected into one of the veins in your child's hand. As the dye passes through the veins that lead to the heart, a series of X-ray images (pictures) are taken.

- **Duplex ultrasonography** (or **duplex scan**): in this type of **ultrasound scan**, a small handheld device is moved around your child's skin, and uses sound waves (**ultrasound**) to create images of the blood vessels and how blood is flowing through them.

### Preparing for surgery

Your child will be given a **general anaesthetic**, special medicine so he or she can sleep through the procedure and not feel any pain. The **anaesthetist** will speak to you about the best option for your child. You will be asked to give written **consent**, or permission, for the surgery.

### What happens

Your child will be moved into an **operating theatre**, a room where surgery takes place.

The general anaesthesia will be given as an injection or breathed in. When your child is asleep, the surgeon will make a small cut in your child's arm – this is usually in the inside of the wrist or elbow.

Your child may be given **antibiotic medicines** to prevent infection.

### After the surgery

Your child will go back to the ward, where he or she will be monitored by a healthcare team – this may be for one or two days, or longer. He or she will have a dressing over the cut.

Your child may feel some effects from the anaesthesia, but these do not usually last long. They include feeling sick and being sick (vomiting), headache, sore throat, or feeling dizzy or light-headed.

## Risks

### Creating the fistula

All surgery has some risks, but these are very rare.

Occasionally, children bleed from the fistula or have an infection. Some need to go back to the hospital and/or take antibiotic medicines to treat an infection.

### Failure to develop

Occasionally, a fistula fails to develop. Your surgeon will look for any problems immediately after the surgery. If a fistula is not working, your doctor will speak to you about different options.

- Your child may return to the operating theatre, so the surgeon can try to repair the fistula and make it bigger, or create a new fistula.
- Your child may need to have a line inserted to use over the short or long term.
- If the fistula does not work, and if your child is unable to have a line, your surgeon may recommend an **arteriovenous graft**. This is like a fistula, but an artificial tube is used to join the artery and vein.

## Steal syndrome

Sometimes, a fistula leads to less blood flow to the hand. This is called '**steal**' syndrome – because the fistula is 'stealing' blood where it is otherwise needed.

If your child says that his or her hand feels like it is tingling, numb or cold, tell a member of the nursing or medical team. Occasionally this needs surgery.

## Looking after a fistula

Your child will probably be able to go home 1–3 days after the surgery.

### Dressing

The ward staff will let you know when to remove the dressing. Some children with a brachiocephalic fistula will also have a sling around their arm.

### Assessing the fistula

You and your child will need to check the fistula several times a day.

- You may be given a **stethoscope**. Put this over the skin of the fistula to listen for a 'whoosh' sound.
- Lightly put your fingers over the skin of the fistula to feel a 'buzz' or a 'thrill'.
- Look at the fistula to make sure it does not look different than normal – that it is not red, swollen or bruised.

If your child cannot feel the buzz – or if it is very faint – give him or her a drink of water and check again. If there is still no or little buzz, contact your renal unit.

### Other

- Your child may need to take some medicines, such as aspirin, to reduce the risk of his or her blood clotting.
- Try to make sure your child does not wear tight clothing, or jewellery or a wristwatch, on the arm with the fistula.
- Avoid harm to the arm. Your child can be active, but he or she should avoid contact sports such as rugby.
- Although infections are less common than with a line, it is important to keep the area around the fistula clean to prevent infection.
- Keep the arm warm, especially when the weather is cold.
- Make sure that the arm with the fistula is not used to take blood samples or insert a cannula (a plastic tube). Blood pressure should not be taken on this arm.

## Complications

### Bleeding

Sometimes there is bleeding after dialysis where the needles were inserted.

- Apply pressure for at least five minutes – using gauze.
- If there is no more bleeding, place a plaster over the site.
- If there is still bleeding, apply more pressure. If it does not stop after 30 minutes, contact your renal unit.

### Infection

If the fistula looks red, or if your child complains it is painful, contact your renal unit as soon as possible. This may mean that the fistula is infected, which needs quick treatment.

### Dehydration

If your child gets dehydrated (not enough water in his or her body), this may lead to less blood flow to the fistula and may cause blood clots. If your child feels dizzy or faint, is vomiting or has diarrhoea, contact your renal unit.

Some children will need to have more fluids for a short time. Occasionally, children need to be admitted to hospital to be given intravenous fluids (into a blood vein).

### Other

If the fistula looks different from normal, or if the arm feels different from usual or painful, contact the renal unit straight away.

If you think the fistula might have been injured, check how it looks and whether it is still buzzing. Contact the unit as soon as possible.

→ **If the fistula is cut, call 999. It may bleed heavily. While waiting for emergency services, apply pressure to the wound and raise the arm.**

## Further information

This is the end of the information on fistulas for haemodialysis. Further topics about kidney conditions, tests and treatments are available on the infoKID website at [www.infoKID.org.uk](http://www.infoKID.org.uk).

## Your notes and contact information

[www.infoKID.org.uk](http://www.infoKID.org.uk)



© BAPN and Kidney Care UK 2013-2022, all rights reserved

For details on any sources of information used in this topic, please contact us through our website [www.infoKID.org.uk](http://www.infoKID.org.uk). We take great care to make sure that the information in this leaflet is correct and up-to-date. However, it is important that you ask the advice of your child's doctor or nurse if you are not sure about something. This information is intended for use in the United Kingdom, and may not apply to other countries.

The British Association of Paediatric Nephrology (BAPN), Kidney Care UK and the contributors and editors cannot be held responsible for the accuracy of information, omissions of information, or any actions that may be taken as a consequence of reading this information.