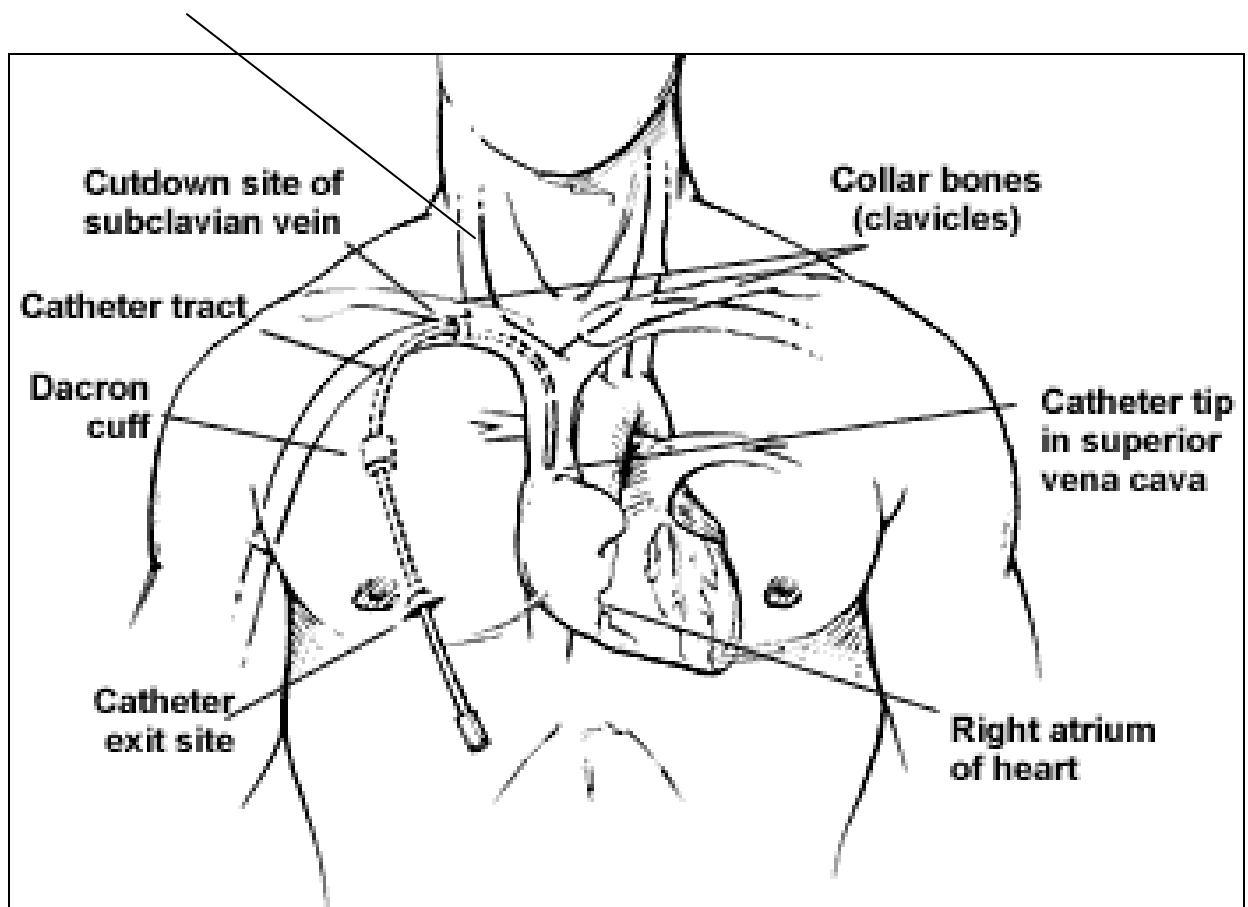


# **Central Venous Catheters (Hickman®) Guide for parents**

© IV Team  
Unit ICI  
Great Ormond Street Hospital  
For Children NHS Trust  
And the Institute of Child Health

## Diagram to show position of a Central Venous Catheter

**In children at GOS, the catheter is usually inserted in via the jugular vein**



## **WHAT IS A CENTRAL VENOUS CATHETER?**

It is a silicone rubber tube, which is tunneled under the skin of the chest wall to a vein in the neck. From there it is threaded through a large vein into the right atrium of the heart. There is a Dacron™ cuff on the part of the catheter, which is under the skin, and this helps to keep it in place because the body's own tissue grows and attaches to it. This cuff is situated between the exit site of the catheter and the neck incision. It can take over eight weeks for this tissue to form, so a stitch is also used to attach the catheter to the skin. This stitch detaches itself from the skin after a period of time so does not require removal unless it causes problems.

The catheters can stay in position for a year or longer, without causing any problem.

You may hear the term 'Broviac catheter'. This is a very similar catheter, the difference being its size. We collectively call them all Central venous catheters.

## **HOW ARE THEY INSERTED?**

The line is inserted in theatre whilst your child is under a general anaesthetic. The Surgeon makes two incisions; one on the side of the neck, to access a vein and one near the nipple. A skin tunnel is then made between the two incisions and the catheter is threaded through. The surgeon then makes a small incision in the vein, which is usually the internal or external jugular vein. He will then thread the catheter through that vein until it gets to the large vein at the entrance to the right atrium of the heart. Your child will have a very short x-ray to check the position of the tip of the catheter.

The incision in the neck is then closed with dissolvable stitches and covered with steristrips, which should stay in place and be kept as dry as possible for 5 days. A clear dressing will be placed on the chest over the exit site to secure the line and help prevent infection.

It is quite safe having the catheter in this chosen vein, because it lies in the same direction as the blood flow and so will not causing a blockage.

## **WHY ARE THEY USED?**

Your child requires a catheter to help us give him/her their treatment in the safest, least painful and most convenient way. We can use the catheter to give your child their chemotherapy as well as any other necessary drugs,

fluids or blood products. The catheter can also be used for the majority of routine blood samples that your child will need during their treatment. It may be necessary in some special circumstances to take blood samples from your child's finger (for example for antibiotic levels) or from a vein in their hand or arm. This would be for specific tests and the reasons will be explained if this becomes necessary

### **WHAT CARE DOES THE CATHETER REQUIRE?**

The catheter is looked after using aseptic non-touch technique; which involves careful hand washing, the use of gloves and being very clean. You will also notice a cap on the end of the catheter to protect it.

After each time the line is used, it must be flushed with saline and then a solution called Hepsal or Heplock (10 units of Heparin / ml). This solution will help to prevent blood clots from forming in the catheter. If the catheter is not being used regularly, it must still be flushed weekly to prevent blockage. The caps on the end of the catheter must also be changed weekly.

The dressing will initially be changed the day after catheter insertion and then it will be changed weekly. The old dressing is removed. The skin around the exit site is then cleaned with an antiseptic solution and a clean dressing is reapplied. The line must be looped underneath the dressing for added security.

If the dressing becomes loose, wet or dirty it should be changed immediately.

### **POTENTIAL PROBLEMS**

#### **INFECTION**

The risk of infection is potentially great. Therefore, when handling the catheter, hands must be washed thoroughly in order to minimize the chances of introducing infection. If the catheter does become infected, it does not necessarily mean it has to be removed. Attempts are made at clearing the infection with antibiotics, which are usually successful. However, if the infection persists, the catheter would have to be removed.

The skin around the exit site may also become infected. Discharge, tenderness, redness or swelling around the exit site could all be signs of infection. If you notice redness tracking between the exit site and the neck incision you must inform your local hospital or community team immediately. A swab of the exit site will be taken and blood will be sent for cultures. Exit site infections can progress to catheter infections if not treated promptly. If the exit site is infected, your child will be given antibiotics, and will need their dressing changing more regularly.

## **HOW TO PREVENT INFECTION**

There are several things that you can do to reduce the risk of infection.

1. Ensure that the dressing is changed at least once a week and is secure, covering the entire exit site. It will need to be changed immediately if it is wet, soiled or is coming loose.
2. Ensure that the catheter is kept as clean as possible, e.g. make sure that the ends are not in nappies and that the entire catheter is kept out of bath water. In hospital we cover the bungs with a glove, at home you can use cling film as an alternative.
3. The dressing of choice at Great Ormond Street is called an IV3000. These are splash proof (but not waterproof) and will help to prevent water from getting to the exit site and potentially causing an infection. Your child will be able to have a bath so long as the catheter ends are taped up and out of the way and your child doesn't totally submerge in the dirty water. Please do not let your child go swimming, as this is also an infection risk. If the dressing does get wet in the bath, it must be changed immediately.

N.B Take your child's temperature as per the neutropenic protocol; (go up to the local hospital if the temperature remains 38.0°C for 1 hour. If the temperature is 38.5°C go straight up - don't wait). This is because when children are neutropenic, they are very susceptible to infection and the line is a possible source of infection. If you speak to someone you are not familiar with, please state that your child has a catheter.

## **BLOCKAGE**

Although this is uncommon, the catheter may become blocked. This is generally due to a build up of particles within the catheter. This can be avoided by effective flushing of the line and by ensuring that the clamps are always on. If a blockage does occur, a doctor or specially trained nurse can inject a special medicine called Urokinase or Alteplase into the line, which acts as a clot buster and does not harm your child.

## **BLOOD SAMPLING PROBLEMS**

Sometimes it may be difficult to get blood samples from your child's catheter. This can be for a number of reasons. The catheter may be resting against the vein wall, which will make it difficult to aspirate blood, or there may be a kink in it. These problems can usually be solved by flushing the catheter with saline or by changing your child's position. If the problem persists we may take an x-ray to check the position of the catheter tip, and to check for kinks.

We may also use Urokinase or Alteplase in case a small clot is beginning to form at the tip of the catheter.

## **BREAKAGE**

It is possible that the catheter can become damaged, usually due to excessive pulling or handling, or accidental severing (occasionally helped by teeth or a pair of scissors!). As long as there are two inches of 'good' catheter remaining, the damaged part of the catheter can be removed and a new piece of catheter attached. Just contact the IV team on weekdays or the wards at any other time to arrange for the catheter to be repaired.

## **HOW TO PREVENT BREAKAGE**

1. Whenever possible ensure that the catheter is kept underneath clothing. This will help to prevent your child from getting hold of the catheter. Vests made of a stretchy elasticated material are available from the ward.
2. Try to stop a toddler from biting and pulling at the catheter.
3. Do not leave your child unsupervised with scissors.
4. If a split does occur, clamp the catheter close to the skin and contact the hospital for further instructions. You will be given an emergency pack and written guidelines on safety before your child is discharged

## **ACCIDENTAL REMOVAL**

This is extremely rare, although an ever-present risk, especially with young children. Sometimes a catheter can be pulled out slightly; if the catheter is dislodged a lot, it may have to be removed.

## **HOW TO PREVENT ACCIDENTAL REMOVAL**

1. Ensure the line is always fully secured to the chest with the catheter looped underneath the clear IV3000 dressing. A netelast vest (available from the ward) or a small bag hung around the neck can help to keep catheters out of the way when not in use. Younger children and babies may require extra loops and tape to secure their catheters.
2. Keep the catheter out of the way of toddlers' fingers.
3. When an in-patient, help us to keep the infusion lines off the floor, so that no one trips over them, resulting in the catheter being pulled.

4. It may be advisable to stop your child from participating in contact sports like rugby in case the catheter is accidentally pulled.

**N.B.** If the catheter is accidentally removed, pressure should be applied at the scar on the neck and at the exit site on the chest to stop blood loss. Blood loss is usually minimal, because it comes from the skin tunnel and not the heart. If the catheter does come out completely, you should take your child and the catheter to your local Hospital.

## **THROMBUS**

This is a rare complication associated with catheters. A thrombus is a blood clot, which forms around the catheter and may interfere with its function. In more serious circumstances, the clot may affect your child's circulation. If your child complains of pain or there is any swelling in their neck or arm on the side where the catheter is, please inform your local hospital and a member of the IV team or ward staff at Great Ormond Street immediately. The treatment for thrombus is planned individually for each child. Sometimes medicines are used to dissolve the clot, and sometimes the catheter has to be removed.

## **AIR EMBOLUS**

This is a very rare complication. It is when air enters the blood stream. If the catheter is damaged in any way, blood usually flows out through the catheter preventing air from getting in. All infusion lines are primed with fluid before being connected to prevent an air embolus. It takes quite a lot of air to cause a problem - small air bubbles are not dangerous.

## **HOW TO PREVENT AIR EMBOLUS**

1. Ensure that the clamps on the catheter are closed at all times. If the catheter is damaged and blood is leaking, use the blue clamps immediately. The IV team will show you how to use the clamps before your child is discharged.

**DO NOT LIFT THE CATHETER ABOVE THE LEVEL OF YOUR CHILD'S HEART IF THERE IS A HOLE IN THE CATHETER.**

## **REMOVAL OF THE CATHETER**

A catheter can stay in place for a year or longer. However, when the time has come for it to be removed, you will be bound to feel relieved!

The catheter is removed under general anaesthetic and is usually done as a day case.

The catheter is removed by controlled pulling. This means that the cuff is usually left behind. You may still be able to feel a slight bump under the skin, which you should not be concerned about. Very occasionally, the cuff may irritate your child's skin and it can become red and inflamed. You should inform your local hospital if this does occur. If you specifically want, the cuff can be removed at the same time as the catheter but this would mean another small scar. The ward staff will give you instructions on the care of the wound after the catheter has been removed.

Due to infection risks children are not able to keep their catheters after removal.

We do hope that you and your child do not find the catheter too much of an ordeal or too disruptive to your daily lives. Problems with the catheters are unusual and the Intravenous Therapy Team will always be pleased to help you and your child by answering any queries you may have.

## **HOME CARE OF THE CATHETER**

**If you wish to** you can usually be taught to care for your child's catheter at home.

You may find that tape marks are left on your child's skin. A little Vaseline rubbed into them can help if they are difficult to remove with just soap and water. The hospital does stock special solutions for plaster removal. They can, however, damage the actual catheter and they cannot be used for IV3000 dressings.

## **LOCAL SERVICES**

The majority of local hospitals and community teams are extremely competent at caring for catheters. Others, however, have less experience. Before your child is discharged, we will ring your local hospital and community team and if necessary send information leaflets on the care of the catheter. We can also arrange a visit to teach them catheter care, and they are of course free to contact us at any time.

## **RETURNING TO SCHOOL**

It is possible for your child to return to school when the catheter is still in situ. The majority of children would normally know how to clamp their catheter and not to take the cap off. However, you may experience some anxiety at the prospect of leaving your child at school with no adult having any knowledge of the catheter. We have designed a leaflet for your child's teacher, which is



available on request. It would be more appropriate if you gave them this leaflet and a pair of clamps rather than us just posting it. If the teaching staff would like to talk to us about the catheter, we would be pleased to do so. Alternatively, your symptom care nurse or PCN will visit the school to discuss the catheter.