

## Acute Central Venous Catheters

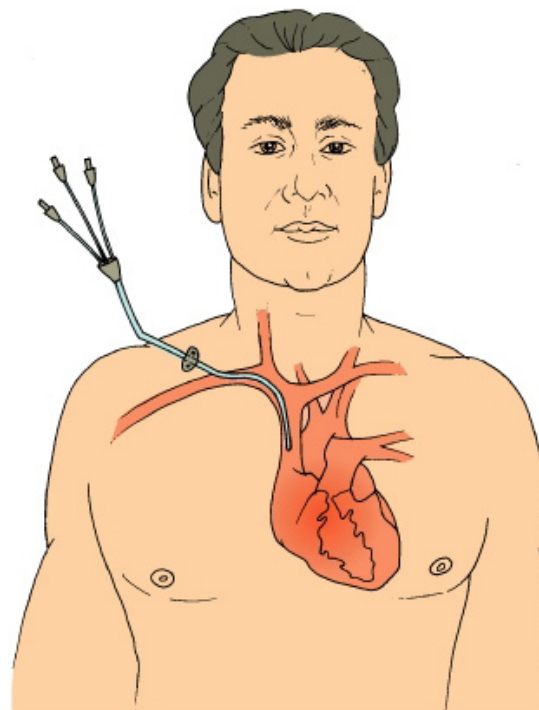
### Central Venous Access Service, Buckland Ward

#### What is an acute central venous catheter (CVC)?

A CVC (sometimes called an acute line) is a tube (catheter) that is inserted into a vein. This may be a vein located under your collarbone (subclavian vein), in the neck (internal jugular vein) or the groin (femoral vein). The tip of the catheter is passed along the vein until it is positioned in a larger vein. This vein is called either the superior vena cava or the inferior vena cava. The CVC is made from polyurethane and is designed to stay in place for periods extending from one to four weeks. The catheter is secured in position with two stitches that stay in place until the device is removed.

All types of intravenous drugs (for example, chemotherapy, antibiotics, blood products and other fluids) can safely be given via the device. Blood samples can also be withdrawn from it. The catheter may have one, two, three or four tubes (lumens). Your doctor may choose this type of device if:

- you require medication that must go into a large vein
- you require several types of intravenous medication
- the veins in your arms are difficult to access
- you require large volumes of intravenous fluids very quickly



Copyright© 2005 Lippincott, Williams & Wilkins Instructor's Resource CD-ROM to Accompany Fundamentals of Nursing: The Art and Science of Nursing Care, 5th edition

#### Who puts it in and what does it feel like?

A doctor or specialist nurse will insert the central venous catheter. The procedure usually takes approximately 30 minutes. A local anaesthetic is injected to numb the area where the catheter will be inserted. Great care will be taken by the person inserting the catheter to avoid introducing any infection. This will involve the use of sterile gloves and drapes.

The injection of the local anaesthetic does sting. Most patients say this is the most uncomfortable part of the procedure. However, the anaesthetic works quickly and then very little further discomfort should be felt.

#### Can I be sedated for the procedure?

Some people feel some anxiety in anticipation of the procedure. A sedation drug called Midazolam can be given into an arm vein, to help alleviate any such fear. The drug has three main properties; it makes you sleepy, happy (euphoric) and induces a short period of amnesia (memory loss). Although you will remain easily rouseable (conscious sedation) it is very unlikely you will remember the procedure.

The drug can slow down your breathing rate, so its use is not appropriate for everyone. The person putting in the CVC will discuss with you whether Midazolam is appropriate for you. If you are being sedated, you should not eat anything for four to six hours before the procedure. It is important however, that you continue to drink normal amounts. For further information about Midazolam, please see the information leaflet called 'Information for patients who will be receiving sedative drugs'.

### **What else do I need to know?**

A routine chest x-ray will be taken after the procedure to show exactly where the tip is positioned. This is not required if the CVC has been placed in the femoral (groin) vein. Immediately after the CVC has been placed, you will have a small dressing placed over the insertion site. After the local anaesthetic has worn off, you may feel some discomfort around the area where it has been inserted. This can be relieved by taking a mild painkiller. The pain usually begins to ease after a day or two.

### **Are there any procedure complications that I need to know about?**

Although inserting a CVC is quite straight forward, there are difficulties and complications known to be associated with the procedure.

- Sometimes a few attempts may be required to locate and insert the needle into the vein. This may cause local bruising and some tenderness around the area.
- A small amount of bleeding can occur (immediately after the procedure) around the insertion site. This is quite common and is easily controlled by applying an extra dressing that puts direct pressure on the site. If your platelet (blood cells that help stop bleeding) count is low, you may require a transfusion of blood platelets.
- An artery runs parallel with the vein, no matter which approach is being used. On rare occasions, it can be punctured with the needle used to locate the vein. The blood in our arteries is under a greater pressure than in the veins, so artery punctures tend to bleed more. Any bleeding is managed by applying extra pressure to the site for five to ten minutes.
- Sometimes the chest x-ray shows that the catheter may have been inserted too far. This rarely causes any problems, but it is best practice to withdraw the catheter a few centimetres. This is so that the tip is correctly positioned just above the heart chambers. This is a simple and painless procedure that takes about five to ten minutes.
- There is a rare risk that the top of the lung could get punctured during the procedure. This may lead to one lung deflating (pneumothorax). If this occurs, it may be necessary to have an additional tube placed in the side of the chest to re-inflate the lung.

### **What problems can arise after the insertion procedure?**

The following information is intended to give you more awareness of some of the late complications associated with a CVC.

- Blood cannot be withdrawn from the CVC  
On rare occasions, fluids can be given into the lumens, but blood cannot be withdrawn. This is most frequently caused by a small blood clot that attaches to the tip of the catheter. It is not dangerous, but can be frustrating because blood samples may have to be taken with a needle from another vein. A chest x-ray may be taken to ensure that the tip is still in the correct position in the vein. This is not applicable to femoral catheters. If it has dislodged, the device may have to be removed.

- Blocked lumen

Sometimes one of the lumens can become completely blocked by a small blood clot. Weekly flushing helps to avoid this problem. Periods of vomiting, straining on the toilet and excessive coughing can increase the risk of this occurring. A chest x-ray will initially be taken to identify as to whether there is another cause. In many cases the injection of a drug called Urokinase, which dissolve clots, will resolve the problem.

- Infection

If you have a suspected infection, blood will be withdrawn (blood cultures) and sent to the laboratory. This is to see whether any bacteria are present in your blood. You may also be given antibiotics down the lumen/s of the catheter. If an infection is confirmed, the CVC may need to be removed. However, this decision is dependant on the type of infection that has been identified and how unwell it has made you.

- Thrombosis (blood clot)

A rare complication of having a device placed in a vein is that a blood clot may form around it. The clot can slow down and congest the flow of blood through the vein. This is called a venous thrombosis. The most common signs of a forming venous thrombosis in the internal jugular or subclavian (neck) veins are:

- swelling of the fingers (difficulty removing rings)
- pain in the back of the shoulder
- a headache that is worse when lying down

For the femoral (groin) vein, the signs are swelling and pain in the calf or thigh. It is important that you report such symptoms as soon as possible. The device will need to be removed and quite often you will be prescribed drugs to thin your blood (anticoagulants). This will prevent any more clotting and help to dissolve the clot.

## **How are central venous catheters removed?**

Whilst lying flat, with your bed will be tilted so that your head is slightly lower than your feet. The stitches will then be cut and removed. You will be asked to take a big breath and hold it; the catheter will be withdrawn and then you can exhale. This is a simple procedure, and not overly uncomfortable.

The person removing the catheter will then apply gentle pressure to the site for about five minutes. The hole in the vein closes naturally. An occlusive dressing will be placed over the site, which should be left undisturbed for 48 hours.

## **What should I report to the nurse?**

- You have a fever or experience cold, shivery, flu-like symptoms.
- There is any swelling, redness or discharge at the catheter insertion site.
- You have swollen fingers, pain in the back of your shoulder and/or a throbbing headache that is worse when lying down.
- Painful, swollen calf or thigh (femoral (groin) catheters only)
- There is a tear in the catheter.
- If you ever have any other concerns or worries related to the catheter.

## **Contact numbers**

Central Venous Access Office      020 8725 3153 Monday to Friday (except Bank Holidays)

**Author: Jackie Nicholson, with acknowledgement Michaela Mayhew**

## **St George's Healthcare NHS Trust**

St George's Hospital

Blackshaw Road

London

SW17 0QT

**Tel:** 020 8672 1255

**Website:** [www.stgeorges.nhs.uk](http://www.stgeorges.nhs.uk)



**RAD/ACV/01**

**Published:** June 2014

**Review:** June 2016