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# Central venous access devices

*A guide for  
patients receiving  
intravenous therapies*



Patient Information



## Foreword

This is one of a series of booklets written to provide information for patients and their relatives. It is impossible to include everything you may need to know. Your doctor or nurse will be able to answer specific questions.

This booklet has been prepared by Royal Marsden specialist nurses, with input from doctors and patients.

We hope you find it helpful and would welcome your comments so that the next edition can be improved further.

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## Introduction

Some of the treatment you require will need to be given directly into your bloodstream. In order to do this, we will place a device into your vein, called a venous access device. This enables us to have access to your venous system to give your therapy.

There are several different types of devices available. One type is called a peripheral cannula. It is a small plastic tube that is inserted into a vein in your lower arm or hand, through a needle. This needle is then removed, leaving the cannula in place for a few hours or up to three days while you have treatment. We will remove the cannula when you finish treatment. You will be given a new cannula every time you need treatment.

Sometimes, this can affect the veins and make it harder to insert the cannula into a vein. If this happens it may be suggested that you have a central venous access device put in instead. Some treatment drugs cannot be given into the veins of the hand or the arm and can only be given, through a central venous access device, into a larger vein leading to your heart.

## What is a central venous access device (CVAD)?

A central venous access device (CVAD) is made of a non-irritant material, for example, silicone, which means it can be left in place for several weeks or months. The CVAD may contain one or two tubes. When a CVAD contains two tubes, it is called a double or dual lumen catheter.

## What are the advantages of having a central venous access device?

Whatever the type of CVAD, it can be used to give you fluids and drugs. It may also be used to take blood samples. The CVAD will save you or your child from having repeated needle pricks from blood taking or insertion of cannulas during treatment.



## What are the disadvantages of having a central venous access device?

With any CVAD, there is a risk of infection and a clot forming around the catheter (thrombosis). If you are at risk of developing a thrombosis you may be given a drug called warfarin (a blood thinning agent) to reduce the risk of this occurring. There may also be times when it is not possible to take blood samples from any of the CVADs.

## What types of CVADs are available?

There are three main types of CVADs:

- A peripherally inserted central catheter (PICC) (see page 4)
- A skin-tunnelled catheter (see page 10)
- An implanted port (see page 15).

Each of these devices is described in more detail in this booklet.

## How will I know which device to choose?

You may be able to choose from any of the three main types of CVADs. However, your choice will depend on the type of therapy you are going to have and your physical condition. Your choice may be limited, for example, if you have no suitable veins in your arms or you cannot have a general anaesthetic or you have had lymph nodes removed during breast surgery. Even if you have no choice about the type of device, you may be able to discuss how and where the device will be placed.

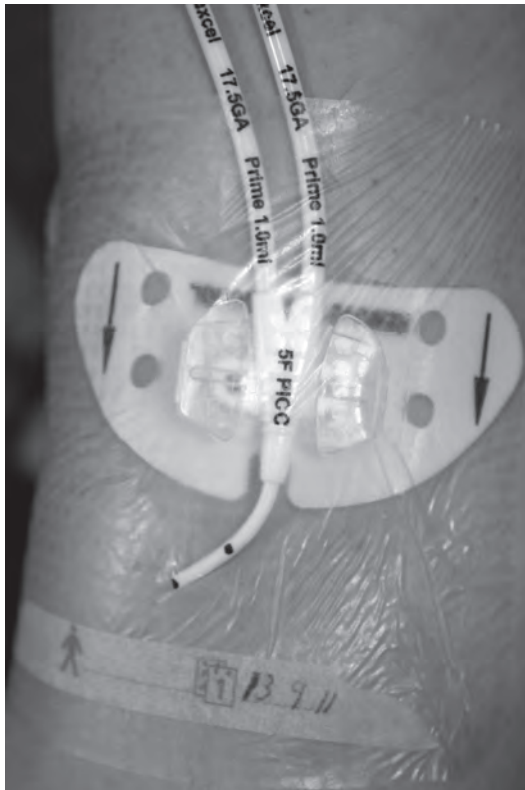
The table below shows at a glance, the main features of the three different types. More detailed information about each individual type follows afterwards. However, talk through your choice of device with your nurse, as there may be variations between different hospitals.

	<b>Peripherally inserted central catheter (PICC)</b>	<b>Skin-tunnelled catheter</b>	<b>Implanted port</b>
<b>Do I have to go to theatre and have an anaesthetic?</b>	No	Yes But only a local anaesthetic and sedation	Yes You will need a general anaesthetic
<b>Will it leave any scars when removed?</b>	No	Yes	Yes
<b>Can I bath and shower with it in?</b>	Yes But you can't soak your arm in the bath	Yes But you can't submerge your chest in the bath	Yes
<b>Will I still have to have needles inserted for my treatment?</b>	No	No	Yes
<b>Can I swim with it in?</b>	No	No	Yes
<b>Do I need to have the dressing changed?</b>	Yes Once a week	Yes but only for the first three weeks	No
<b>Does it need to be flushed?</b>	Yes Once a week	Yes Once a week	Yes Once a month

## Peripherally inserted central catheters (PICCs)

### What is a PICC?

A peripherally inserted central catheter (PICC) is a tube, which is inserted into a vein in the top of your arm, above the bend of the elbow. It is moved up into the large vein leading to your heart. A PICC can be placed in either arm.



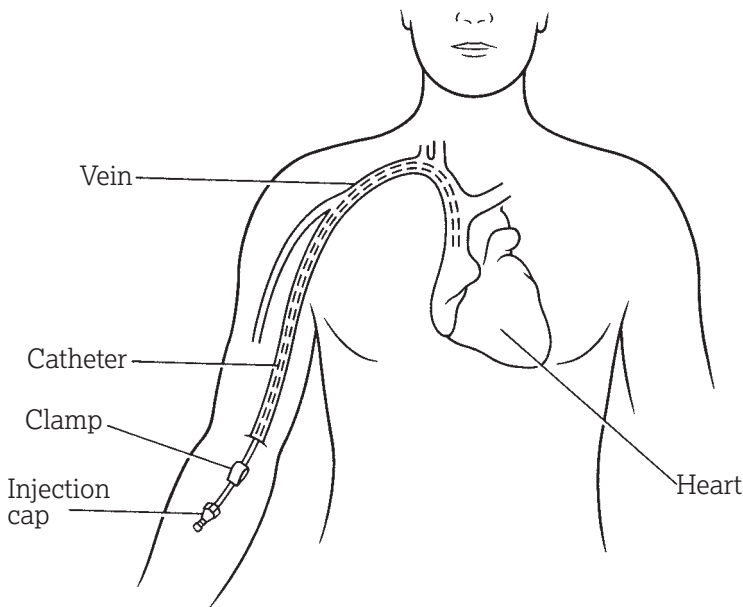
### What are the advantages of a PICC?

- You do not have to go to theatre to have it inserted
- You do not need a surgical procedure to insert or remove it
- It does not leave any scars
- There is less risk of complication during insertion

## What are the disadvantages of a PICC?


- The dressing needs to be changed once a week by a carer/relative or nurse
- You can't go swimming with a PICC and it may restrict you continuing with other vigorous sporting activities.
- It cannot be used for any nuclear medicine test injections and may only be used for CT or MRI scan injections in certain circumstances.

## How is the catheter inserted?



*Diagram of a PICC*

A nurse or doctor will locate your vein using an ultrasound machine and then inject a local anaesthetic to remove the sensation from the skin over the vein. A small cannula is inserted into the vein and then an introducer is inserted through which the catheter is threaded until the tip is in the correct position. The introducer is then removed and only the catheter is left. A special device is clipped to the PICC to secure it in place on the skin.



A dressing and some extra padding are placed over the catheter. This is to reduce any bleeding which may occur in the first 24 hours. A chest x-ray will be taken to check that the PICC is in the right place.

## How do I care for the PICC?

Initially, the dressing must be changed within the first 24 hours following insertion of the PICC and the extra padding removed. This is because there can be leakage of blood which may cause the dressing to lift or become unstuck. The dressing will usually be changed before you leave hospital. If you are not staying in hospital, you'll be asked to come back to the hospital the following day to have your dressing changed. If this is difficult for you, then we can try and arrange for your district nurse to change your dressing. After this first time, the dressing will only need to be changed once a week. This can be done by a district nurse or we can teach a relative or friend to do this for you when you are at home.

You should have a shower, bath or all over wash every day to keep your skin generally clean.

The transparent dressing over the exit site is waterproof. However, take care not to get the catheter or extension set wet. The dressing must remain clean, dry and stuck firmly to your skin. You will be given a waterproof sleeve to wear in the shower to protect the PICC.

The Statlock securing device keeps the PICC securely in place and will be changed when loose or dirty.

During the first week after your catheter has been inserted, the catheter site may be red and inflamed. Warmth, like a covered hot water bottle and resting the arm on a pillow, may relieve this. You can use warmth for the first 48 hours to reduce the likelihood of this happening. If it doesn't help, contact the hospital.

## How does the PICC dressing get changed?

This procedure describes changing the initial dressing with the extra padding. After this first dressing change, the transparent

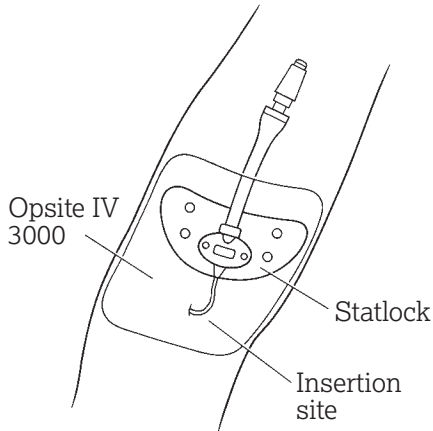
dressing will then need to be changed once a week following the same steps (excluding step 6).

1. Gather all the items you need on a clean surface.
2. Wash your hands and open the dressing pack.
3. Remove the bandage and gauze.
4. Place the dressing towel under the arm and open the ChloroPrep sponge onto the pack.
5. Carefully peel off the old transparent dressing and throw it away.
6. Then carefully remove the steristrips and the gauze dressing over the insertion site and throw them away (this gauze dressing does not need to be replaced unless instructed).
7. Wash your hands, dry well and put on gloves.
8. Clean around the catheter with the sponge, using backward and forward movements. Allow the area to dry.



*Cleaning around the catheter*

9. If necessary, remove the Statlock securing device, taking care not to pull the catheter. Attach the PICC to the new Statlock before applying it to the skin.
10. Open the transparent dressing and remove sheet 1.
11. Place the dressing on the arm so that it covers the catheter insertion site and the Statlock.



12. Press the dressing into place as you remove sheets 2 and 3.
13. Wrap the lumen/s in gauze to prevent pressing into the skin.
14. Finally, place a bandage or tubigrip over the gauze, but not over the transparent dressing, as it allows any moisture to escape from the site and helps to prevent infection.

## How do I flush the catheter?

The catheter must be kept clear by injecting it (flushing) with heparinised saline. You will use 5ml (50iu) of heparinised saline once a week, after your dressing has been changed. If you have a dual lumen catheter you must inject both tubes in the way described. The injection caps will need to be changed once a week at the time of flushing.

1. Wash your hands well, and dry them.
2. Fit a green needle on the end of the syringe.
3. Break the heparinised saline ampoule as instructed.
4. Draw up the heparinised saline and remove any air.
5. Clean the connection between the cap and the catheter with an alcohol swab, let it dry and then remove the old injection cap.
6. Open the new injection cap and remove the plastic cover.
7. Attach to the end of the catheter.
8. Attach the syringe onto the cap.
9. Slowly inject the contents of the syringe 1ml at a time.
10. Remove the syringe, keeping the pressure on the plunger of the syringe.
11. Dispose of your used equipment as you have been told, into the special sharps container.

### What equipment will I be given?

- A PICC pack containing ChloroPrep swabs to use when cleaning around the catheter, Opsite IV3000 dressings, a Statlock, gauze swabs, bandages and dressing packs.
- A flushing kit containing needleless injection caps to seal end of the catheter, alcohol swabs, a supply of heparinised saline ampoules as well as some needles and syringes.

### How is the catheter removed?

Taking out a PICC is not a special procedure. It will be similar to having a cannula removed. The nurse will place your arm on a pillow and then remove the dressing. Then s/he will gently pull the catheter out of the vein and apply a dressing to the site. This dressing can be removed after 24 hours.

## Skin-tunnelled catheters

### What is a skin-tunnelled catheter?

A skin-tunnelled catheter is a tube (sometimes called a 'Hickman' line) which is inserted through your chest into a large vein leading to your heart. Along the catheter, there is a small cuff which you may be able to feel through your skin. This cuff prevents the catheter from moving or falling out. The catheter can be inserted on either side of your chest.



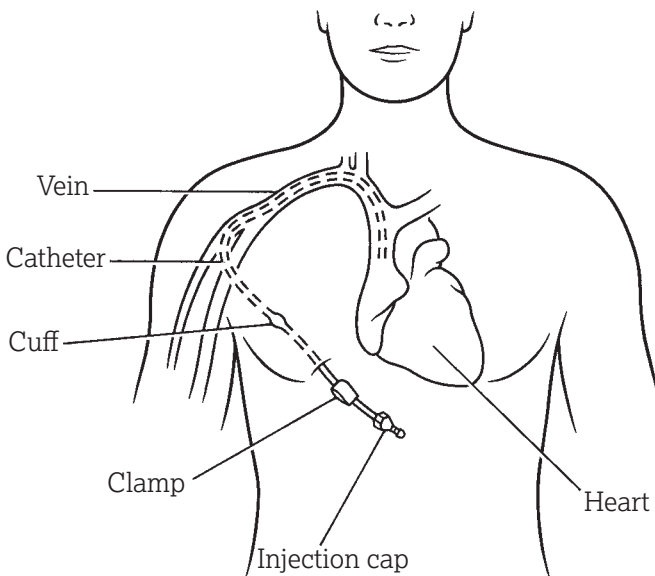
### What are the advantages of a skin-tunnelled catheter?

- It does not need any dressings once the stitches are removed.

## What are the disadvantages of a skin-tunnelled catheter?


- You will need to go to theatre to have the catheter inserted. This is carried out under sedation using local anaesthetic.
- It does require a surgical procedure to remove it (but not in theatre).
- You will be left with three small scars.
- You cannot go swimming while you have a skin-tunnelled catheter but your other activities should not be restricted.
- It cannot be used for any nuclear medicine test injections and may only be used for CT or MRI scan injections in certain circumstances.

## How is the catheter inserted?



*Diagram of a skin-tunnelled catheter*

You will be admitted to hospital for the day. A doctor will insert the catheter, usually using a local anaesthetic, which numbs an area on your chest. You will also be given a sedative to relax you and make you sleepy. Occasionally a general anaesthetic may be used.



Only two small cuts will be made on your chest, one to tunnel the catheter and the other, near to your collar bone, to insert it into your vein. You will have two stitches, one where each cut has been made. You will be told when and by whom these should be removed.

After the catheter has been inserted, your shoulder may feel stiff and painful for a couple of days. You may find painkillers help relieve the discomfort. A chest x-ray will be taken to check that the catheter is in the right place.

### How do I care for the skin-tunnelled catheter exit site?

The dressings are changed after the first 24 hours and then once a week until the stitches are removed at three weeks. You will not need to have a dressing once the stitches have been removed. However, some people prefer to tape a small piece of gauze over the exit site. This should be changed every day.

You should have a shower, bath or all over wash every day to keep your skin generally clean. If you do not shower, then you should clean around the exit site with cooled boiled water and cotton wool when you wash or when you change the gauze dressing.

### How do I flush the catheter?

The catheter must be kept clear by injecting it (flushing) with heparinised saline. You will use 5ml (50iu) of heparinised saline once a week. If you have a dual lumen catheter you must inject both tubes in the way described. The injection caps will need to be changed once a week at the time of flushing.

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4. Draw up the heparinised saline and remove any air.
5. Clean the connection between the cap and the catheter with an alcohol swab, let it dry and then remove the old injection cap.
6. Open the new injection cap and remove the plastic cover.

7. Attach to the end of the catheter.
8. Attach the syringe onto the cap and open the clamp.
9. Slowly inject the contents of the syringe 1ml at a time.
10. Remove the syringe, keeping the pressure on the plunger of the syringe. Only close the clamp after the syringe has been removed.
11. Dispose of your used equipment as you have been told, into the special sharps container

### What equipment will I be given?

- A pack with gauze, tape and a pouch for supporting the skin-tunnelled catheter
- A flushing kit containing needleless injection caps to seal the end of the catheter, alcohol swabs, a supply of heparinised saline ampoules as well as some needles and syringes.


### How is the catheter removed?

If you are taking Warfarin 1mg you will need to stop four days before the catheter is removed. If you are taking Warfarin for a thrombosis or any other reason (and carry a yellow Warfarin book) tell the nursing staff or doctors as you may need a different type of anticoagulant.

Usually, you will be admitted as a day case and be in hospital for three to four hours. You may eat and drink on the day of the procedure as it is carried out under local anaesthetic on the ward.

When you arrive at the hospital, a blood sample will be taken to check platelets, haemoglobin, and clotting rate. These are done to make sure that there is no risk of bleeding during the procedure.

You will then be free to relax until the results of the tests are available. This usually takes about two hours. If these results are not satisfactory it will not be safe to remove the catheter and you may be asked to return in a few days. You will also be asked if you have had any oozing, redness, swelling or pain at the exit site of the catheter.



The procedure is carried out by a specially trained nurse or doctor and usually takes about 30 minutes. You will be asked to lie flat on the bed with one pillow. If you have difficulty lying flat then please let the nursing staff know.

You may have felt a small lump under the skin where the catheter is – this is the cuff (see diagram page 11). If the lump is not visible, the nurse or doctor will check its location using a tape measure. A local anaesthetic is then injected under the skin around the cuff. This will sting for a minute or two. When the area is numb, a small cut is made in the skin and the catheter is removed. You may feel a pulling and pushing sensation but you are unlikely to feel pain. However, if you do feel pain let the nurse or doctor know and they can give you more anaesthetic.

Once the catheter is out, the cut is stitched with two or three stitches. A dressing will be applied to the wound. You will be asked to continue lying flat for 30 minutes and if there is no further bleeding, you will be able to leave the hospital. You will be able to drive after the procedure.

You will need to dress the area each day until the stitches are removed. So if you have any dressing, gauze, or tape at home, then keep them to use for the dressings. If you need more dressings, these will be supplied before you are sent home.

If the wound bleeds within the first 24 hours you will need to apply a further dressing over the original one. If the bleeding continues or you are concerned then please telephone the ward. This further bleeding may result in a bruise, but this is normal.

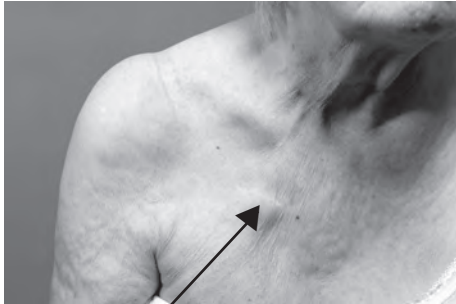
If you have any pain following the removal of the catheter you may take painkillers that you would normally take for a headache.

Following removal you should:

- Avoid heavy lifting for the first 24 hours
- Avoid getting the stitches wet
- Contact your district nurse or GP practice nurse to organise for the stitches to be removed after seven days.

## Implanted ports

### What is an implanted port?



*A port*



*A port with special needle*

An implanted port (sometimes called a ‘Portacath’) is a device, which is inserted under the skin into your body. The usual position is on the chest. It can be placed on either side of your chest. The port is made up of a portal body and this is connected via a thin tube (catheter) inserted into one of the body’s veins – see diagram below. The port can be felt through the skin. Entry to the port is gained by puncturing the silicone membrane with a special type of needle, which is attached to a length of tubing (an extension set). This will allow you to receive fluids and drugs or have blood samples taken from it. Puncturing the port is similar to pricking the skin with a pin. Naturally it takes some getting used to. If it is painful, we can apply local anaesthetic gel to the area 30 minutes before we insert the needle to numb the skin.

### What are the advantages of an implanted port?

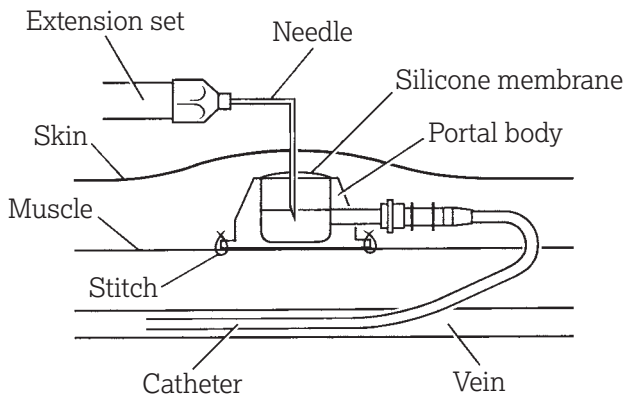
- It only needs to have the needle put in when we need to use it.
- The needle is removed in between treatments and you will not have to worry about any dressings or flushing the catheter.
- It doesn’t restrict your normal activities including swimming.

### What are the disadvantages of an implanted port?

- You still need to have a needle inserted each time the port is used. The port can sometimes be difficult to access.

- You will need to go to theatre or other specific department for the insertion and removal, which is carried out under general (or sometimes local) anaesthetic.
- Most ports only provide a single lumen for access so if you need more complex therapies, then you may also need to have peripheral cannulas inserted.
- It will leave some scars and if you are worried about scars then discuss this with the surgeon. However in order for the surgeon to position the port to reduce scars, the nurses may find it more difficult to gain access to it. As a result, you may find the needle access procedure more uncomfortable.
- If you need to have blood tests, for example, at your GP surgery, or local hospital you may find that the surgery staff are not trained to take blood from a port.
- It cannot be used for any nuclear medicine test injections and may only be used for CT and MRI scan injection in certain circumstances.

## How is the port inserted?



*Diagram of an implanted port*

You will usually be admitted to hospital for the day, unless you are coming in overnight for your treatment. It is advisable not to drive if you are in for the day and you should arrange for someone to collect you after the procedure.

The port is inserted by a surgeon and usually takes place under a general anaesthetic. Two small cuts will be made. One to form a pocket for the port to sit in and the other, an entry site used by the surgeons to put the catheter through. The stitches over the pocket are usually dissolvable. The stitches at the entry site may need to be removed after seven to ten days or may be dissolvable. A chest x-ray will be taken to check that the port and catheter are in the right place.

### How do I care for the port?

There is no special care needed for a port. The needle is removed in between treatments and you will not have to worry about any dressings or flushing the port.

### How is the port removed?

The port is removed under general anaesthetic, usually as a day case.

## Are there any risks involved in the insertion of a CVAD?

Occasionally there can be complications when inserting a catheter. For example, with a port or skin-tunnelled catheter, the needle or guide wire can scratch the top of your lung causing a pneumothorax (an air pocket). You would probably be unaware of this but you may become slightly breathless. A pneumothorax would show up on x-ray and would be treated straight away. This wouldn't cause any long term problems. The catheter may also not thread into the correct position; this is more likely with a PICC. A chest X-ray is taken after the catheter has been inserted to check that it is correctly positioned also to check there is no pneumothorax. Sometimes there may be bruising at the site where the needle went into your vein.

## In what circumstances should I contact the hospital?

Contact the hospital immediately if you notice any of the following:

- You develop a high temperature, fever, chills or flu like symptoms (this could be an infection) – refer to your alert card.
- Your arm, neck or shoulder is swollen and painful (this could be a sign of a blood clot).
- You have pain or burning when flushing the catheter.
- You can't flush your catheter easily without resistance – this could indicate that the catheter has become blocked (never use force when flushing the catheter)
- Your catheter is cracked or broken (fold/clamp the tubing and tape it securely).
- Your catheter is pulled out - which may mean the tip of the catheter is not in the correct position.
- You think your catheter site looks red and inflamed, there is any discharge or the redness is tracking up your arm from your PICC (after the first week) – could be early signs of infection.
- Your PICC is leaking under the dressing.
- Your PICC is partially pulled out (that it is the amount of exposed catheter is more than \_\_\_\_\_ cm). Do not attempt to push it back in.

## Insertion details

All devices:

Type of device:

PICC  Skin-tunnelled catheter  Implanted port

Insertion date \_\_\_\_\_

Insertion by \_\_\_\_\_

Brand of CVAD \_\_\_\_\_

Lumens — single  dual  triple

Size of catheter (French) — 4 / 5 / other \_\_\_\_\_

Tip location —

Additional information on PICC:

Arm used — left / right

Vein used \_\_\_\_\_

Length of catheter inserted \_\_\_\_\_

External markings on catheter showing \_\_\_\_\_ cm

Any other comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

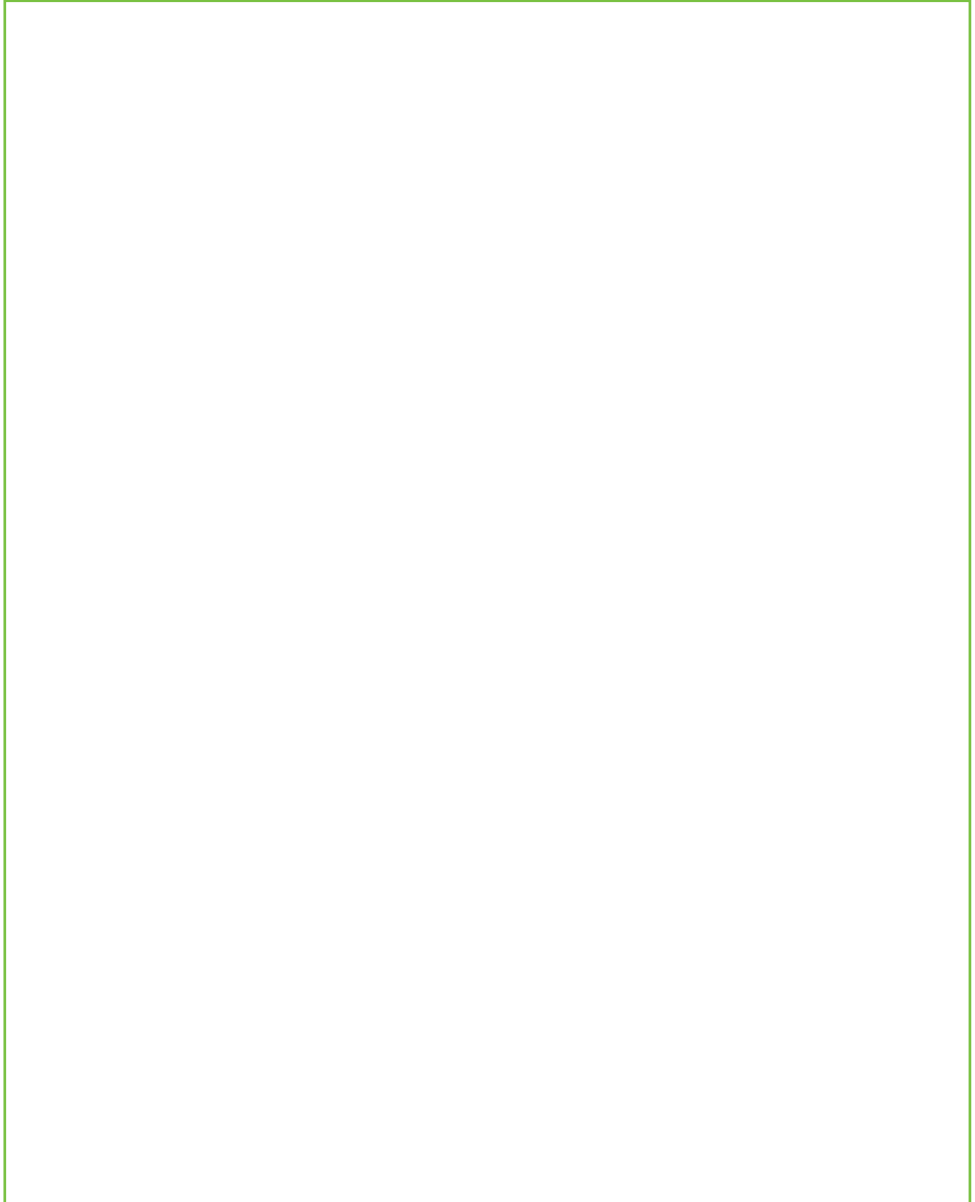
\_\_\_\_\_

\_\_\_\_\_



## Notes/Questions

You may like to use this space to make notes or write questions as they occur to you, to discuss with your specialist nurse or doctor.





## Sources of information and support

### **Macmillan Cancer Support**

89 Albert Embankment

London SE1 7UQ

Macmillan freephone helpline: 0808 808 0000

Website: *www.macmillan.org.uk*

Provides free information and emotional support for people living with cancer and information about UK cancer support groups and organisations. Offers free confidential information about cancer types, treatments and what to expect.

### Website

### **National Institute for Health and Clinical Excellence (NICE)**

MidCity Place

71 High Holborn

London WC1V 6NA

Website: *www.nice.org.uk*

NICE provides guidance for healthcare professionals, and patients and their carers that will help to inform their decisions about treatment and healthcare.

### **Department of Health guidance**

Clean, safe care: reducing infections and saving lives  
(January 2008)

This document draws together initiatives to tackle healthcare associated infections and improve cleanliness to ensure that patients receive clean and safe treatment whenever and wherever they are treated by the NHS.

## Where can I get help?

If anything unusual occurs, if you have any problems or are worried about any aspects of your CVAD, please contact:

Ward/department

---

Telephone number

---

Your nurse specialist

---

Telephone number

---

at \_\_\_\_\_ Hospital

Telephone number

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This booklet is evidence based wherever the appropriate evidence is available, and represents an accumulation of expert opinion and professional interpretation.

Details of the references used in writing this booklet are available on request from: The Royal Marsden Help Centre  
Freephone: 0800 783 7176  
Email: [patientcentre@rmh.nhs.uk](mailto:patientcentre@rmh.nhs.uk)

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London SW3 6JJ

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The information in this booklet is correct at the time of going to print.



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The Royal Marsden publishes a number of booklets and leaflets about cancer. Here is a list of information available to you.



## Diagnosis

- A beginner's guide to the *BRCA1* and *BRCA2* genes
- CT scan
- MRI scan
- Ultrasound scan



## Treatment

- Central venous access devices
- Chemotherapy
- Clinical trials
- Radiotherapy
- Radionuclide therapy
- Your operation and anaesthetic



## Supportive Care

- After treatment
- Coping with nausea and vomiting
- Eating well when you have cancer
- Infection Prevention and Control
- Lymphoedema
- Support at home
- Your guide to support, practical help and complimentary therapies



## Your hospital experience

- Help Centre for PALS and patient information
- How to raise a concern or make a complaint
- Your comments please
- Your health information, your confidentiality



Life demands excellence

