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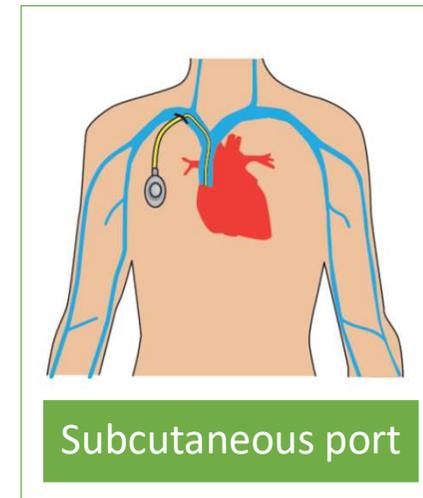
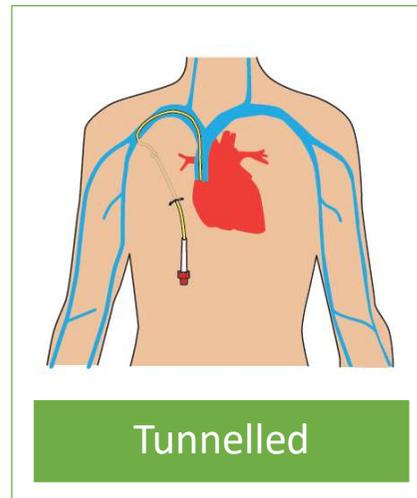
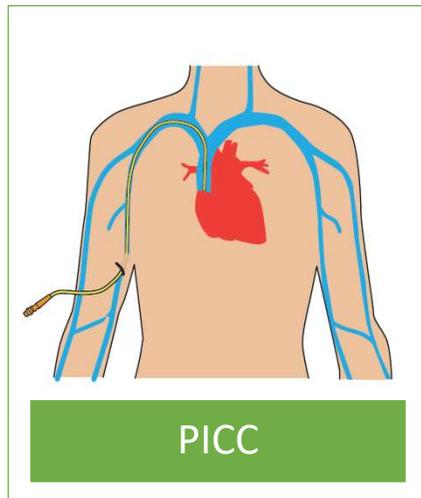
CARE FOR THE DIFFERENT CVC (central venous catheters)

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# TYPES OF LONG-TERM CENTRAL VENOUS CATHETERS (CVC)



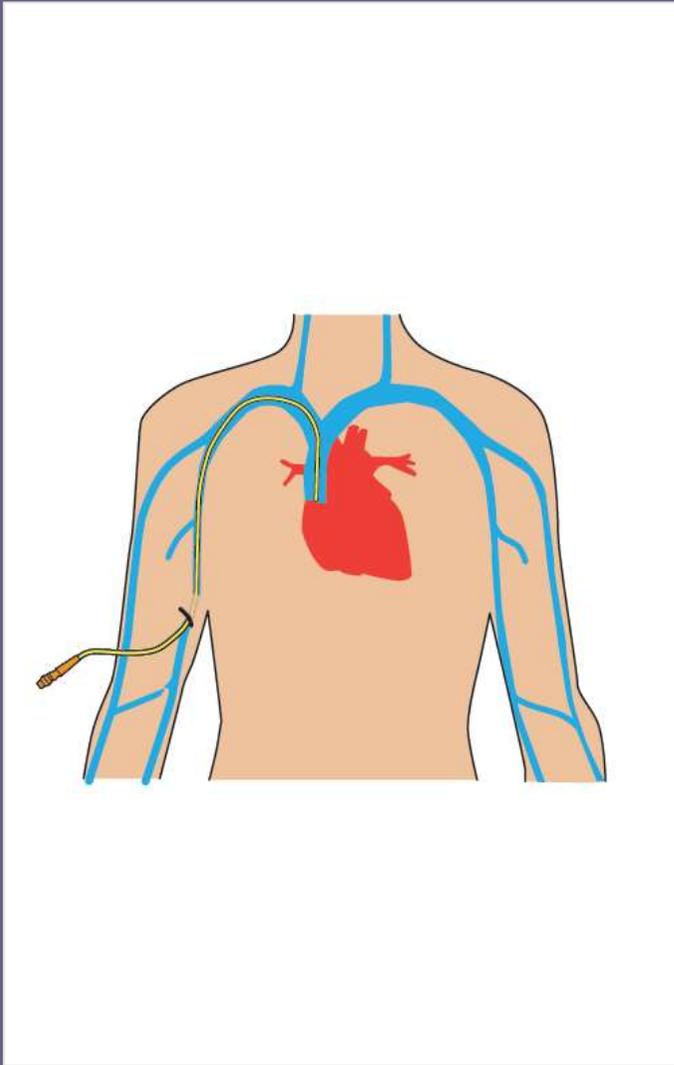
GENERAL STANDARD FOR PARENTERAL NUTRITION AT HOME:  
MINIMUM CALIBRE, MINIMUM NUMBER OF LUMINA

# MAIN FEATURES OF LONG-TERM CVC (I)

Type of catheter	Advantages	Disadvantages
<b>PICC</b>	<ul style="list-style-type: none"> <li>-Does not require skin puncture to be used</li> <li>-Easy to place and remove (possible on the ward and by a registered nurse)</li> <li>-It can be placed with small alterations in coagulation</li> <li>-Possibility of long periods without use; little maintenance</li> <li>-Lower overall cost</li> <li>-Possibility of repairing external part</li> </ul>	<ul style="list-style-type: none"> <li>-Limited movements (lifting weight, postures)</li> <li>-Easier accidental pulling</li> <li>-Body image distortion</li> <li>-Risk of it coming out due to traction</li> <li>-Not indicated for under water</li> </ul>
<b>Tunnelled</b>	<ul style="list-style-type: none"> <li>-Does not require skin puncture to be used</li> <li>-Possibility of repairing external part</li> <li>-Difficult removal after fibrosis of the subcutaneous tunnel</li> </ul>	<ul style="list-style-type: none"> <li>-Body image distortion</li> <li>-Limitation of activities</li> <li>-Increased risk of infection</li> <li>-Placement and removal in the operating theatre</li> <li>-Not indicated for under water</li> </ul>
<b>Subcutaneous port</b>	<ul style="list-style-type: none"> <li>-Less body image distortion</li> <li>-Does not interfere with social or sports activities</li> <li>-Less risk of infection</li> <li>-Possibility of long periods without use; little maintenance</li> <li>-Difficult removal</li> </ul>	<ul style="list-style-type: none"> <li>-Requires periodic puncture with a gripper needle</li> <li>-Placement and removal in the operating theatre</li> <li>-Higher overall cost</li> </ul>

# MAIN FEATURES OF LONG-TERM CVC (II)

Age	Umbilical catheters	PICC	Tunnelled	Subcutaneous port
< 1 year	In newborns 2.5 Fr (30 cm) 3.5-8 Fr (40 cm) SHORT TERM	1-3 Fr 1-2 lumina	-Broviac 2.7-6.6 Fr (1 lumes) -Groshong 3.5-5.5 Fr (1 lumes), 5 Fr (2 lumina)	rarely used
1-3 years	-	3-5.5 Fr 1-2 lumina	-Broviac 2.7-6.6 Fr (1 lumen) -Groshong 3.5-5.5 Fr (1 lumen), 5 Fr (2 lumina)	better catheters
Children in school age (4-11 years)	-	4-5.5 Fr 1-2 lumina	-Broviac 2.7-6.6 Fr (1 lumen) -Groshong 5.5-8 Fr (1 lumen), 5 Fr (2 lumina)	6-6.6 Fr
Teenagers	-	4-6 Fr 1-2 lumina	-Hickmann 9.6 Fr (1 lumen), 7 y 9 Fr (2 lumina) -Groshong 5.5-8 Fr (1 lumen), 5 Fr (2 lumina)	6, 6.6, 8, 9 Fr
Adults	-	4-6 Fr 1-2 lumina	-Hickmann 9.6 Fr (1 lumen), 7 y 9 Fr (2 lumina) -Groshong 7-8 Fr (1 lumen), 9.5 Fr (2 lumina)	6, 6.6, 8, 9 Fr



## 1-PICC

- The acronym in English stands for *Peripherally Inserted Central Catheter*.
- It is a peripheral insertion central catheter.
- It can have 1 or several lumina, and there are several brands on the market.
- These specific characteristics (name, thickness, material, number of lumen, date of placement) must be included in the identifying documentation of the catheter and on the medical record.
- If the catheter has several lumina, we will save one for the administration of parenteral nutrition.
- The catheter is placed under local anaesthesia, by professionals of the nursing, anaesthesia or interventional radiology teams. The healthcare staff of your centre will teach you the necessary CARE steps for its proper use and operation.

# PRIMARY CARE

## 1.1-Prevent infection

- ❖ Wash your hands before and after you touch any part of the PICC.
- ❖ Follow the indications given by your centre regarding wound care.
- ❖ Avoid performing tasks in dirty places: gardens, stables, masonry jobs, etc.

## 1.2-Keep the PICC line dry

- ❖ Both the catheter and the dressing must remain dry. When showering, you can cover the area with transparent kitchen film, wrapping it around several times to prevent water from entering.
- ❖ If the dressing gets wet, replace it immediately.
- ❖ Do not submerge your arm in water: you will not be able to bathe in the sea or in the pool; these waters that are considered to be potentially contaminated. In addition, swimming could lead to an accidental removal of the PICC.

### 1.3-Avoid any damages to the PICC line

- ❖ Do not use any cutting or sharp objects near the catheter (scissors, blades, etc.).
- ❖ If you live with pets, you should especially protect the area to avoid scratches, bites, etc.
- ❖ Do not let the catheter hang freely. It should always be covered with a mesh or bandage to prevent pulling that may lead to an accidental removal. Be careful when getting dressed and undressed.
- ❖ It is recommended that you bend your knees, rather than your back, when you are bending over. Keep your back straight and your head raised. Place your feet on a chair or stool to tie your shoe laces.
- ❖ Checking blood pressure and performing blood extraction from the same arm where the PICC is placed are not recommended.

### 1.4-Prevention of thrombosis

- ❖ Use the arm that has the PICC line while performing your usual activities, but avoid any activity that causes discomfort.
- ❖ Avoid activities or exercises that require excessive movement. Do not lift anything that weighs over 4 kg with the arm that has the PICC catheter inserted.

# WEEKLY WOUND CARE

- It should usually be carried out once a week, although you should change the dressing more often if it gets wet or dirty.
- Check the dressing every day.
- Wound care must be sterile (rigorous hand washing before handling ALWAYS).
- Aqueous chlorhexidine (in concentrations greater than 0.5%) as an antiseptic of choice.
- Occlusive dressing must be transparent.
- Dressing, bio-connector (anti-reflux cap or bio-safety cap) and catheter stabilisation device will be changed weekly.
- It is advised not to use ointments or creams with antibiotics / anti-inflammatories / corticosteroids at the insertion point.
- If you are going to perform the weekly wound care at home, make sure you or one of your family members knows how to do the procedure, following a sterile technique and the protocol of your referral centre.

# WASHING AND HEPARINISATION-SEALING

- ALWAYS immediately after disconnection of parenteral nutrition. The procedure should be done on all catheter lumina.
- Wash hands before and after handling.
- Clean the bio-connector (anti-reflux cap or bio-safety cap) with aqueous chlorhexidine before connecting the syringe.
- Leave to dry 30 seconds.
- Wash the catheter with 10 cc of 0.9% saline solution with a 10-cc syringe (NEVER LESS).
- Heparinise/seal with 3 ml 20 ui/ml heparin (Fibrilin®) loaded in a 10-cc syringe (NEVER LESS), using the positive pressure or the push-stop-push-stop technique (using pressure centimetre by centimetre). They will let you know the frequency of heparinisation at your centre.
- To end the sealing process, USE POSITIVE PRESSURE (insert the last 0.5 cc, while closing the clamp), to prevent blood flow reflux into the catheter and avoid blood clots.

## Removal

Your doctor or nurse in charge of care will advise you when the time is right for removal or replacement.

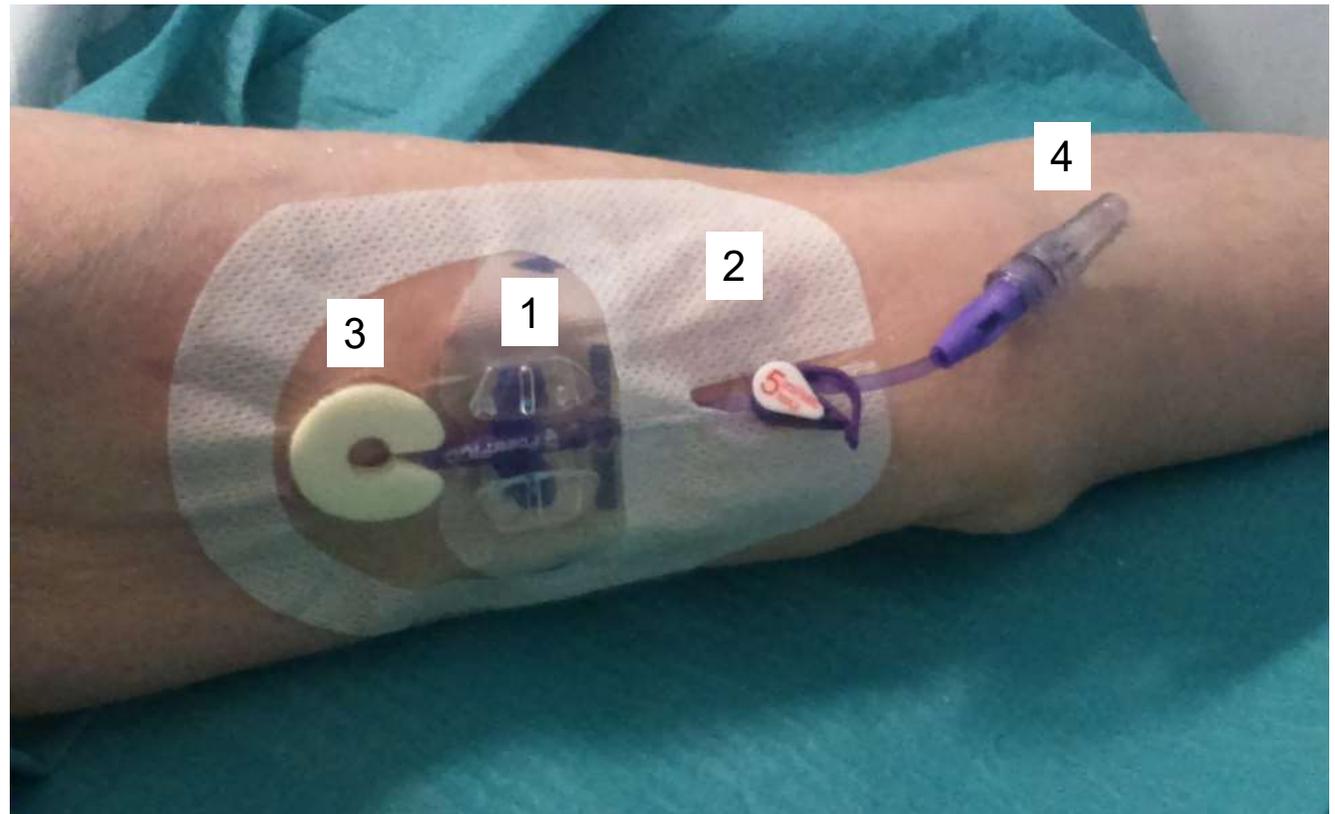
## IN ADDITION TO THE VENOUS CATHETER

**1-Catheter-to-skin stabilisation device:** it is advisable to use specific stabilisation devices (such as Stat-lock®, Grip-lock®).

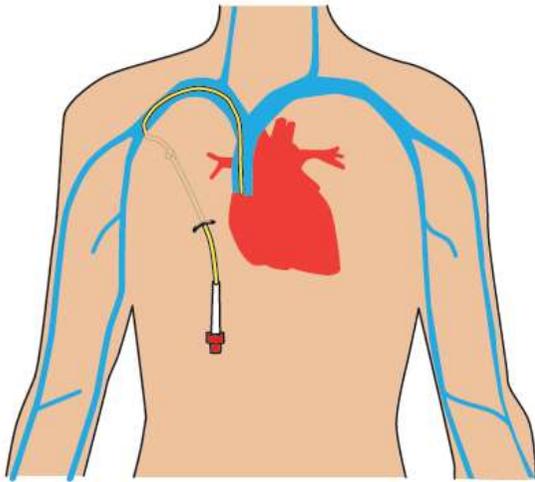
**2-Transparent dressing with reinforced edges:** it will cover the catheter insertion point. It must be transparent to be able to check the insertion point. It will be change every week (or sooner if it gets wet or damaged).

**3-Antimicrobial dressings:** some centres incorporate the placement of antimicrobial dressings surrounding the catheter insertion point in their standard protocol.

**4-Bio-connector (anti-reflux cap):** it is attached to the end of the catheter and changed once a week (along with the dressing and the stabilisation device).



## 2-TUNNELLED CATHETER



- Catheter that is normally inserted in the thorax (rarely in the abdomen), with a subcutaneous path between the insertion point in the vein and the skin.
- A small Dacron sponge cuff attached to the catheter induces an inflammatory reaction in the subcutaneous tunnel, causing subsequent fibrosis that fixes the catheter in place and decreases the risk of infection.
- The catheter is placed under local anaesthesia, by professionals of the anaesthesia, surgery or interventional radiology teams. The healthcare staff of your centre will teach you the necessary CARE steps for its proper use and operation.
- There are different brands on the market. Hickman® is generally used more for adults, and Broviac® for children.
- If the catheter has several lumina, we will save one for the administration of parenteral nutrition.

# BASIC CARE FOR TUNNELLED CATHETER

- Keep the catheter site as clean as possible to avoid infections.
- After placement, the subcutaneous path will take a few days to heal. Do not pull on the catheter. Be careful when getting dressed and undressed.
- Do not let the catheter go underwater in a tub or pool.
- When you shower, cover the entire catheter site with dressings.
- If you are bleeding from the catheter site or if the catheter comes out, apply pressure to the site and go to the emergency service.

# WEEKLY WOUND CARE

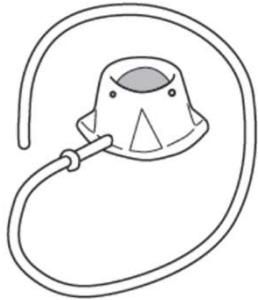
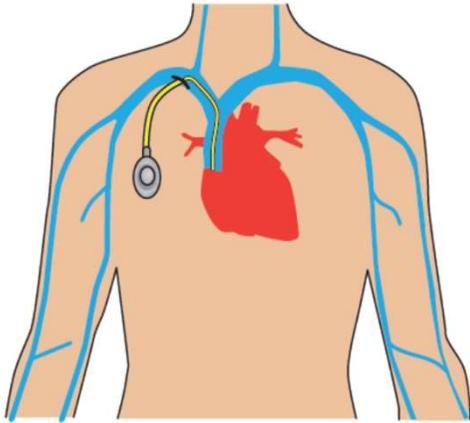
- It should usually be carried out once a week, although you should change the dressing more often if it gets wet or dirty.
- Check the dressing every day.
- Wound care must be sterile (rigorous hand washing before handling ALWAYS).
- Aqueous chlorhexidine (in concentrations greater than 0.5%) as an antiseptic of choice.
- Occlusive dressing must be transparent.
- The dressing and the bio-connector (anti-reflux cap or bio-safety cap) will be changed weekly.
- It is advised not to use ointments or creams with antibiotics / anti-inflammatories / corticosteroids at the insertion point.
- If you are going to perform the weekly wound care at home, make sure you or one of your family members knows how to do the procedure, following a sterile technique and the protocol of your referral centre.

# WASHING AND HEPARINISATION-SEALING

- ALWAYS immediately after disconnection of parenteral nutrition. The procedure should be done on all catheter lumina.
- Wash hands before and after handling.
- Clean the bio-connector (anti-reflux cap or bio-safety cap) with aqueous chlorhexidine before connecting the syringe.
- Leave to dry 30 seconds.
- Wash the catheter with 10 cc of 0.9% saline solution with a 10-cc syringe (NEVER LESS).
- -Heparinise/seal with 3 ml 20 ui/ml heparin (Fibrilin®) loaded in a 10-cc syringe (NEVER LESS), using the positive pressure or the push-stop-push-stop technique (using pressure centimetre by centimetre). They will let you know the frequency of heparinisation at your centre.
- To end the sealing process, USE POSITIVE PRESSURE (insert the last 0.5 cc, while closing the clamp), to prevent blood flow reflux into the catheter and avoid blood clots.
- Because the Groshong® catheter has an anti-reflux closure system, it does not require routine heparinisation maintenance. Ask your team what protocol to follow if you have this type of catheter.

## Removal

Your doctor or nurse in charge of care will advise you when the time is right for removal. As with placement, the removal of the device will be done in the operating theatre with local anaesthesia.



## 3-SUBCUTANEOUS PORT

- This device is usually implanted in the thorax (sometimes in the forearm) and accessed through a special needle (grasper) that can remain implanted for up to one week (if necessary).
- After puncturing the chosen central vein, a subcutaneous pocket will be created to house the reservoir.
- The catheter is placed under local anaesthesia, by professionals of the anaesthesia, surgery or interventional radiology teams. The healthcare staff of your centre will teach you the necessary CARE steps for its proper use and operation.
- It is generally made from titanium, with different sizes and brands available on the market.

# WEEKLY WOUND CARE

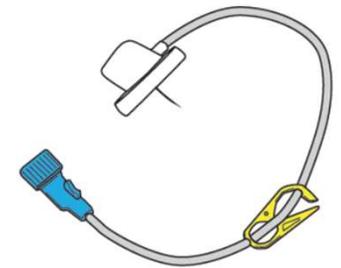
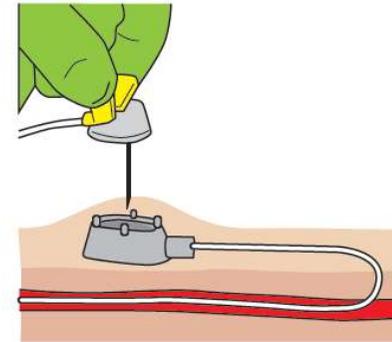
- It should usually be carried out once a week, although you should change the dressing more often if it gets wet or dirty.
- Check the dressing every day.
- Wound care must be sterile (rigorous hand washing before handling ALWAYS).
- Aqueous chlorhexidine (in concentrations greater than 0.5%) as an antiseptic of choice.
- Occlusive dressing must be transparent. If you are not going to use the reservoir you will not need to cover it with transparent dressing.
- The dressing and the bio-connector (anti-reflux cap or bio-safety cap) will be changed weekly.
- It is advised not to use ointments or creams with antibiotics / anti-inflammatories / corticosteroids at the insertion point.
- If you are going to perform the weekly wound care at home, make sure you or one of your family members knows how to do the procedure, following a sterile technique and the protocol of your referral centre.

# WASHING AND HEPARINISATION-SEALING

- ALWAYS immediately after disconnection of parenteral nutrition.
- Wash hands before and after handling.
- Clean the bio-connector (anti-reflux cap or bio-safety cap) with aqueous chlorhexidine before connecting the syringe.
- Leave to dry 30 seconds.
- Wash the catheter with 10 cc of 0.9% saline solution with a 10-cc syringe (NEVER LESS).
- Heparinise/seal with 3 ml 20 ui/ml heparin (Fibrilin®) loaded in a 10-cc syringe (NEVER LESS), using the positive pressure or the push-stop-push-stop technique (using pressure centimetre by centimetre). They will let you know the frequency of heparinisation at your centre.
- To end the sealing process, USE POSITIVE PRESSURE (insert the last 0.5 cc, while closing the clamp), to prevent blood flow reflux into the catheter and avoid blood clots.
- Then, you will keep the gripper needle (with bio-connector at the distal end) if you are going to continue with parenteral nutrition in the following hours.
- In case of not needing HPN, it can be left without the dressing after heparinisation.

# NEEDLE CHANGE

- To avoid pricking every day, we recommend changing the needle every 7-10 days. It can be more frequent if you want to remove the needle to have a bath, for example.
- To change it you have to visit your referral health centre or, if you prefer, the nurses at your centre can teach you how to do it.
- You can be without the needle whenever you want in periods of time when you do not need parenteral nutrition.



## Removal

Your doctor or nurse in charge of care will advise you when the time is right for removal. As with placement, the removal of the device will be done in the operating theatre with local anaesthesia.

# IDENTIFICATION DOCUMENTATION FOR LONG-TERM CVC PATIENT

**Type of catheter-name**

**Fr**

**No. lumina**

**Size gripper needle**

**Code / serial number**

**Date of placement of current catheter**

**Location**

**Wound care / heparinisation frequency**

**Background of other long-term central venous catheters:**

**-date of placement, removal and location**

**History of catheter sepsis (date and microorganism)**

**History of catheter blood clots (date and location)**

# COMPLICATIONS (I)

SYMPTOMS	APPROACH	PREVENTION
<p><b>Tear or complete rupture of the catheter</b></p> <p><b>Accidental catheter removal</b></p>	<p>Clamp the catheter as close as possible to its point of insertion in the skin</p> <p>If rupture is not complete, infuse heparin before clamping</p> <p>Cover the tear site with sterile gauze dressing</p> <p>Contact your referral team for repair or replacement</p>	<p>Avoid excessive pressure when connecting or disconnecting the nutriline to the catheter</p> <p>Take care during washing and getting dressed and undressed to prevent tearing, rupture or moving of the catheter</p>
<p><b>Catheter obstruction:</b> <b>Inability to aspirate or infuse</b> <b>(obstruction alarm on pump screen)</b></p>	<p>Make sure the catheter is not bent or angled at any point</p> <p>Verify that the catheter is not pinched</p> <p>Gently pull the syringe plunger to draw blood. If there is blood visible, try flushing again.</p> <p>If you cannot draw blood or flush, close the catheter using the usual technique</p> <p>Notify your referral team</p> <p>NEVER FORCE PRESSURE WITH THE SYRINGE</p>	<p>Never forget to correctly seal / heparinise the catheter at the end of PN administration (following indications of the protocol of your centre)</p>

# COMPLICATIONS (II)

SYMPTOMS	APPROACH	PREVENTION
<p>Redness, swelling and/or suppuratation at the catheter insertion point or in the subcutaneous tunnel path, with or without a fever</p> <p>Pain or swelling along the catheter conduit or pain while washing the catheter</p> <p>Bleeding at insertion point</p>	<p>Stop TPN administration, following the removal instructions and</p> <p>Contact your team and go to the nearest Emergency Service for evaluation</p>	<p>Always use aseptic techniques following the protocol of your centre</p> <p>Check the characteristics of the material you use and discard the material that is not in good condition</p>
<p>Orifice or ulcer in the puncture site and/or exposure of the silicone membrane of the subcutaneous reservoir</p>	<p>Stop TPN administration, following the removal instructions</p> <p>Notify your referral team</p>	<p>Correctly follow instructions for connecting and disconnecting the TPN given by your centre</p>
<p>Pain and/or swelling of the neck and/or arm on the same side where you have the catheter</p> <p>Swelling in the veins of the neck and/or chest</p>	<p>Stop TPN administration, following the removal instructions</p> <p>Contact your referral team and go to the nearest Emergency Service for evaluation</p>	<p>Correctly follow instructions for connecting and disconnecting the TPN given by your centre</p>
<p>Sudden cough, difficulty breathing, and chest pain or tightness</p>	<p>Clamp the catheter as close as possible to its point of insertion in the skin</p> <p>Lie on your left side, with your head lower than your feet, and urgently call a doctor</p>	<p>Properly use the nutriline closing devices (key caps)</p> <p>Properly purge the nutriline before starting TPN administration</p> <p>Correctly follow instructions for connecting and disconnecting the TPN given by your centre</p>

# WARNING

- Information in this section regarding devices, materials, wound care / sealing-heparinisation protocols, etc. are provided for guidance only.
- Materials available at your centre or the indicated protocols may vary.
- We advise you to ask your reference team any questions you may have and follow the instructions given at your centre.

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