GUIDELINE FOR CLINICAL STAFF ON THE CARE OF : IMPLANTABLE PORTS	
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Central Venous Access Devices (CVAD), is a broad term used to include many catheter types which are inserted into a peripheral/central vein in the body to deliver medications or other therapies to children.

A catheter has one end positioned outside the body while a port is surgically placed under the skin and requires a special needle to access it.

The most common CVADs include:

- Peripherally Inserted Central Catheter inserted into one of the peripheral veins in the upper arm.
- Central Venous Catheter
- Implanted ports inserted into the subclavian or vein or jugular and attached to a fluid reservoir placed in a surgically created subcutaneous pocket in the upper chest or into an arm vein.
- Hickman/Broviac catheter
- Permcath Catheter
- Umbilical Venous Catheter

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1.0 Commonly used reference tables

Table 3. Flush volumes for CVADS

Line type	Age	Blood discard volume	Suggested Flush volume for pre and post line use	Heparin dose
PICC/Midlines It is not possible to withdraw blood from a 1-2fr PICC	< 1 year	1ml	0.5ml	10 units/ml
	1-3 years	2.5ml	0.6	10 units/ml
	> 3 years	3.5ml	0.8	10 units/ml
Central Venous Catheters	< 1 year	1 ml	0.5-1ml	10 units/ml
	1-3 years	2.5ml	1-2.5mls	10 units/ml
	> 3 years	3-5ml	3-5 mls	10 units/ml
Hickman/Broviac	< 1 year	1 ml	As per surgeons	10 units/ml
	1-3 years	2 ml	As per surgeons	10 units/ml
	> 3 years	3-5 ml	As per surgeons	10 units/ml
Implantofix In some cases it may be requested that blood is withdrawn from an Implantofix.	< 1 year	N/A	1ml -2.5 mls	10 units/ml
	1-3 years	N/A	1ml- 2.5mls	10 units/ml but Use 100units/ml when on discharge for patients with CF
	> 3 years	N/A	1ml-2.5mls	10 units/ml
Umbilical Venous Catheters	< 1 year	1ml	0.5-1ml	10 units/ml
	1-3 years	N/A	N/A	10 units/ml
	> 3 years	N/A	N/A	10 units/ml
Permcath-Vascath	< 1 year	1ml	0.5-1ml	See guideline
	1-3 years	N/A	N/A	See guideline
	> 3 years	N/A	N/A	See guideline

Antibiotic locks must be given using the Pharmacy guideline as per OLCHC formulary app

2.0 Description

An implanted venous access device consists of a portal body attached to a silicone catheter. It is implanted subcutaneously in a convenient but inconspicuous location on the body, usually on the chest. Implanted ports require little care of the site because of the intact skin layer over the accessible port. They also require minimal flushing and permit easy access for fluids and/or medications. There is less interference with daily activities and body image is not threatened by the presence of a catheter.

The catheter is inserted under general anaesthetic. A semi-circular incision is made to create the pouch to hold the port and a separate incision usually in the neck is made to locate the vein into which the

catheter will be placed. After one end of the catheter is placed in a suitable vein the other end is locked to the port and fluid is injected to ensure the system is working properly. The port is then placed in the skin pocket and secured in place with stitches. The port may be used immediately following insertion.
There are two basic parts to the system:

- The port – A small plastic chamber sealed at the top by a rubber disc (septum) designed to withstand multiple punctures.

- A thin catheter – one end is placed into a vein inside the body and the other end firmly attached to the portal with a special lock.

3.0 General Principles for the care of Implantable Ports

Flushing and Maintaining Patency

Prior to accessing the port for flushing and taking blood sampling, the documented port volume plus needle volume should be obtained from the patient's healthcare records.

Note: same general principles regarding flushing and maintaining patency as Hickman catheter applies to Port -A - Cath.

***Note:** Parents are taught to do this at home in some situations.

- 100 units per ml of Heparinised saline are recommended to flush the Port- A-Cath® if the device will not be used for 4 weeks to maintain patency.

- 10 units per ml of Heparinised saline can be used after more frequent drug administration or infusion.

4.0 Port Access

Local anaesthetic cream e.g. Amethocaine 4% w/w (Huband & Trigg 2011) may be used prior to accessing the port. The skin should be washed with soap and water first to remove the ointment based anaesthetic cream, followed by cleaning with an antibacterial agent such as Chlorhexidine or Disposable disinfection wipes (70% v/v Isopropyl alcohol and 2% w/v Chlorhexidine gluconate) before accessing the port.

A Huber point (non-coring) needle and a 10ml syringe (or larger) should always be used to access the port. In OLCHC a Cytocan® or Gripper ® needle is inserted through the skin and silicone rubber septum into the portal chamber for repeated venous access e.g. for antibiotic therapy. Practitioners who have received specific education and training should access a port. (Please refer to the protocol for insertion of Cytocan/Gripper Needle and Flushing of Implanted ports section in the next page)

The needle may remain in place for up to two weeks. The needle should remain in-situ using an occlusive dressing to avoid needle dislodgement e.g. Tegaderm Opsite dressing.

An advantage of a port is that, when the port is not required the needle access is removed.

The disadvantages of a port are the discomfort associated with accessing the port (especially if placed deeply or in a difficult area to access). This can be overcome with the use of topical anaesthetic cream. However, it still requires the insertion of a needle and for some children this may be unacceptable.

5.0 Insertion of a Cytocan / Gripper Needle and Flushing of Implantable Port

DECONTAMINATE HANDS and collect the following:

Requirements

Sterile gloves x 1 pair
Needle free device x 1
10 ml syringe x 2
Gauze x 1 packet
Filter Straw x 2
Non-coring Huber needle with extension set (size individual to child)
Heparin Sodium Flushing Solution (10 units/ml) x 3ml
0.9% sodium chloride solution 10ml
Disposable disinfection wipes x 3
Clear dressing i.e. Tegaderm, Opsite
Clean Tray

6.0 Procedure

Explain the procedure to the patient and the parent. Apply Ametop cream 45 minutes prior to procedure if requested by the patient. Remove Tegaderm and Ametop from patient's skin. Wash skin with soap and water to remove the residue.

- Follow Universal precautions of hand washing and collect the following equipment prior to starting procedure.
- Prepare the sterile field by opening the sterile gloves packet onto tray and using the glove packet as a sterile field. Open all sterile equipment onto the sterile field.
- Bring the tray, vials of Heparinised Sodium Flushing Solution (10 units/ml) and 0.9% sodium chloride.
- solution (10ml) to the child's bedside
- Check expiry date of 0.9% Sodium Chloride and Heparinised sodium 10 units/ml vial clean the neck of vial with Disinfection wipe and dry it for a minimum of 30secs. Break off the top and leave it on a flat surface beside your sterile field.

- Decontaminate hands with antiseptic solution and put on sterile gloves.
- Draw up 0.9% Sodium Chloride and Heparinised sodium 10 units/ml into two separate syringes using ampoule straw, remove ampoule straw, expel any air bubbles and place the syringes in the tray. Unfold Disposable disinfection wipes.
- Connect needle free device to the Huber needle extension set.
- Prime the extension line using a syringe prepared with 0.9% sodium chloride solution and place on sterile field.
- Clean the port site and surrounding skin using disposable disinfection wipes. Working in a clockwise direction clean from the centre outwards for at least 10cm (4 inches). Use each swab once in one direction only.
- Pick up Huber Needle and syringe in right hand and remove guard from needle.
- Using left hands palpate the edges of the port and hold the outer edge through the skin ensuring port is secure & non-mobile.
- Put the needle firmly through the skin and port at a 90 degree angle until it hits the bottom of the port chamber.
- Check for blood return. Open clamp and flush the line with 10ml of 0.9% sodium chloride solution and remove syringe from needle free device.
- Attach the syringe containing Heparinised saline to the Needle free device. Open clamp and inject the heparin solution, closing the clamp as the last 0.5ml is being injected.
- **Removing Huber needle:** Whilst withdrawing the needle it is important to maintain positive pressure by pressing down on the port with two fingers as the last 0.5 ml of flush is infused.
- Apply pressure if oozing. Site may be left exposed following removal of the Huber needle or covered with a dry dressing.
- **IF leaving Huber Needle in situ:** Cover and secure it with a Tegaderm dressing. If needle is not flush with skin place a small piece of keyhole cut gauze between the skin and needle housing.
- Once accessed the Huber needle may remain in situ for up to 14 days or as per local policy.
- Sterile technique must be adhered to while accessing the port with a hubar needle.
- Once accessed and a Needle free bung is applied, strict non-touch technique is sufficient and the **Port is managed as per Hickman Policy.**
- Ensure that the child is comfortable and that the line is well secured.

- Dispose of all equipment appropriately. Decontaminate hands with antiseptic solution.
- Document procedure in patient's healthcare records.

7.0 Troubleshooting

Port-A-Cath Infection

7.1 Definition

A documented rise in temperature in a clinically well child following flushing of the catheter associated with a chill/rigor and transient constitutional disturbance e.g. fatigue or decreased activity that settles spontaneously or with antipyretic measures. (Please follow the same protocol as for the management of Hickman Catheter Line Infections)

7.2 Port Occlusion

Obstruction secondary to thrombus formation is one of the complications associated with implantable Ports. Do not attempt to unblock totally occluded ports unless trained to do so as it may dislodge a catheter embolus. Contact OLCHC, Haematology/Oncology medical team who may decide that Urokinase may need to be prescribed to unblock the line occlusion. *Implantable Port 5,000 Units of Urokinase (Syner-KINASE® brand) in 1ml of saline*

Note: Please follow the Protocol for instillation of Urokinase into a Blocked Hickman Catheter. The same protocol applies to port occlusion also.

7.3 Port Erosion, Splitting of the catheter

If skin breaks down over the port reservoir seek advice from the Haematology/Oncology Team in OLCHC supervising the child's care. Once port erosion occurs the device usually requires removal.

If there is a suspected break on the internal part of the catheter seek advice from the Haematology/Oncology team in OLCHC. The child may need a lineogram to confirm the breakage.

7.4 Port Pocket Infection

Swelling, tenderness and redness at the port site or along the catheter tract suggests port pocket infection. Please follow the action procedure in the next page when needle not in-situ and needle in-situ.

Appendix 1

If needle not in situ

ACTION	RATIONALE
If possible avoid accessing the Port	If needle is inserted through the skin into the Port, infection may be introduced into the Port and catheter. If child's condition dictates or no other venous access available it may be preferable to access the Port. If this action is taken ensure blood cultures are obtained and IV antibiotics are commenced. Contact the medical team at OLCHC supervising the child's treatment.
Culture any purulent discharge	To identify cause of infection
Give IV antibiotics via peripheral cannula for 48 hours	To clear Port pocket infection
Access the Port after 48 hours. If the infection is responding to IV antibiotics the Port may be accessed and antibiotics continued via Port.	Once infection is treated Port may be used. This is advisable if skin infection has cleared to treat any infection that may have entered the Port
Check Port daily for signs of skin breakdown	To identify Port erosion. If Port erosion presents contact OLCHC medical team supervising the child's treatment as device may require removal.

Appendix 2

If needle in situ

ACTION	RATIONALE
Do not remove the needle	It has provided a conduit for the infection which may already have entered the port
Continue to give IV antibiotics via the port for 48 hours	To treat infection if it has tracked through to the port
If no improvement after 48hours remove the needle and continue IV antibiotics peripherally	To rest skin. Port has received some treatment with antibiotics
If improvement in the condition of the skin – continue to treat through the port	Treatment is effective

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