

Guidelines for Caring for Patients with Central Venous Access Devices

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Purpose

These guidelines are to be used for the care of all patients, who have central venous access devices. They are to be used both within the Children's Hospital and in the community by nursing and medical staff that have been trained in their use.

Intended Audience

All nursing and medical staff involved in the care of central venous access devices.

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1. Background and Context

Central venous access devices are inserted when a child requires frequent and/or long term venous access. For example, the administration of parental nutrition, cytotoxic drugs or frequent antibiotics. These lines are usually inserted in theatre by a surgeon when the child is under a general anaesthetic.

A central line can be any of the following:-

Skin Tunnelled Central Venous Access Device, also known as a Broviac or Hickman line, or by the child as a "wiggly".

Direct access central venous access line,

Totally implanted reservoir device also known as a Portacath (port) or TIVAD (Totally implanted venous access device).

Long line, mid line or PICC line which is a less permanent central line used with increasing frequency across the Trust.

2. Best Practice Summary

1. All staff undertaking these procedures must be knowledgeable about and adhere to the relevant hospital policy.
2. An aseptic non-touch technique (ANNT) should be used when accessing any central line (Rowley and Clare, 2010), unless directed otherwise by medical team.
3. Before accessing the line, it is important to check for any sign of damage to the line or attachments. It is also necessary to observe for signs of leakage when accessing the line.
4. Blood should only be taken from the line when clinically indicated, remembering that the system must be flushed afterwards using 0.9% Sodium chloride solution. (See Appendix J on page 12 "Obtaining blood specimens via Central Venous Catheters").
5. When drugs are administered via the system, it must first be flushed with an appropriate solution, e.g. 0.9% Sodium chloride solution in a **10mL syringe**. The line must be flushed before and after each drug is administered and before hepllocking the system. A small number of drugs are incompatible with 0.9% Sodium chloride e.g. Ambisone and some cytotoxic drugs. In such cases the line

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must be flushed with the alternative solution as indicated in the Trust Parental Administration Guideline.

6. Guidance must be sought immediately from experienced clinical staff if there are problems with any line.
7. If the line is difficult to flush, seek immediate advice and/or help from experienced nursing staff in the Trust. (For blocked or stiff lines, please refer to Clinical Guideline No. 986 Central venous access device management.)
8. If there is evidence of back flow or flash back, the system must be inspected, obvious problems rectified and the system flushed clear with 0.9% Sodium chloride before re-heplocking or re-connecting to an infusion.
9. Currently there is Heparin Sodium 10 units per ml available for heplocking central lines. The Heplock Sodium must be prescribed.
10. Any central line that is in use for intermittent boluses, infusions which are running at a low rate or infusions should be heplocked once a day, 0.9% Sodium Chloride flushes are sufficient at other times of access within a 24 hours period.
11. All central lines must be clamped under positive pressure when an infusion or bolus injection is completed.
12. The product to be used for cleaning the access valves and skin around central line insertion sites is 2% Chlorhexidine Gluconate wipes (EPIC 2014). In neonates, skin cleansing is done with 0.5% Chlorhexidine Gluconate solution.

Central Venous Lines (CVL) will terminate with a Trust approved needleless valve. The valve will be changed at the following times or as per manufacturer's recommendations:-

1. Weekly at the time of heplocking, if the line is not in use.
2. Every 72 hours if an inpatient. If an in line filter is used this may be left in situ for 96 hours – see manufacturers guidelines. Document the change in either the medical notes or the nursing documentation.
3. After taking blood cultures.
4. After all blood and blood product transfusions.
5. At every filter/line change on PICU.
6. With every full line change when administering Parental Nutrition as per the Parental Nutrition Guideline.

If not in use, a CVL must be heplocked via the valve weekly, using 3-5mls Heparin Sodium 10 units per ml. The line should then be looped around the exit site and securely taped, and the ends put into a "wiggly" bag worn around the child's neck.

Ports - If not in use, the Port must be heplocked every four weeks, using 4-5mls Heparin Sodium 100 units per ml. When a Port is accessed for intermittent bolus injections, the Gripper extension with Smartsite valve should be securely taped to the skin. This dressing will only be changed when clinically necessary, damaged or contaminated. The valve should be changed at the times stated above for CVLs. It is recommended that the needle is changed every 14 days if in long term use. If the child is neutropenic (Neutrophils < 0.5 x 10⁹/l) the needle should be changed after 7 days.

3. Intended Audience

All nursing, allied healthcare professionals and medical staff involved in the care of central lines.

4. Guideline

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Appendix A:

PROCEDURE FOR CHANGING NEEDLESLESS VALVE

Please refer to the Trust Parental Nutrition guidelines for specific information if a patient is receiving parental nutrition.

<u>Equipment</u>	10ml syringe	
	Sterile gloves	
	5mls Heparin Sodium 10 units/ml	
	Pre-printed label	Blunt fill filter needle
	2%Chlorhexidine Gluconate wipes	Needlesless valve
	Optional sterile dressing towel	

Procedure

1. Wash and dry hands thoroughly.
2. Obtain all the necessary equipment.
3. Open the pack of gloves, empty all sterile components onto the sterile field of glove packaging (or use the dressing towel as a sterile field).
4. Open Heparin Sodium ampoule, place beside sterile field.
5. Open wipes packaging, drop wipes onto sterile field.
6. Bring the child into the treatment room; explain the procedure. Get the child's line out ready for the procedure.
7. Wash and dry hands thoroughly, put on sterile gloves.
8. Using blunt fill filter needle draw up Heparin Sodium 10 units/ml, discard blunt fill filter needle.
9. Clean the valve and end of the line with a Chlorhexidine wipe. **Scrub the hub.**
10. Remove valve, clean the end of the line with another part of the Chlorhexidine wipe. Leave to dry.
11. Attach new valve.
12. Flush line with 4-5mls Heparin Sodium 10 units/ml via new valve using syringe. Whilst giving final 0.5 – 1ml clamp the line, remove syringe.
13. Ensure the child is comfortable and the line is secure.
14. Clear away all equipment, dispose of all items and document in notes according to hospital policy.

Appendix B:**PROCEDURE TO BE FOLLOWED WHEN BREAKING INTO A CENTRAL LINE SYSTEM
– TO CONNECT OR CHANGE INFUSION SETS**

This applies to any type of central line.

<u>Equipment</u>	Prescription chart
	IV fluid
	IV administration set
	10ml syringe
	Blunt fill needle
	Injection tray
	2% Chlorhexidine Gluconate wipe
	5mls 0.9% Sodium chloride solution plus pre-printed label
	Trust approved stopper to cap off syringe

Procedure

1. Wash and dry hands thoroughly.
2. Obtain all the necessary equipment.
3. Prime administration set with prescribed IV fluid. Draw up 0.9% Sodium chloride solution using blunt fill needle. Discard blunt fill needle, attach stopper and label syringe.
4. Explain the procedure to the child and family.
5. Wash and dry hands thoroughly, put on non sterile gloves.
6. Using part of the wipe pick up the end of the central line i.e. needless valve. Thoroughly clean the valve with a Chlorhexidine wipe, allow to dry. **Scrub the hub**
7. Discard stopper, perform access procedure. If line is heplocked, flush with 0.9% Sodium chloride to ensure patency, then connect line. If only changing administration sets, flushing is not required unless there is incompatibility between the infusion fluids.
8. Ensure the system is complete and secure.
9. Set infusion pump as per hospital policy.
10. Clear away all equipment, dispose of all items and document in notes according to hospital policy.

Appendix C:**ADMINISTRATION OF BOLUS DRUGS INTO A CENTRAL LINE VIA A NEEDLELESS VALVE AND THE LINE IS HEPLOCKED**

<u>Equipment</u>	Injection tray
	Prescription chart
	Drugs and diluents (if not prepared by Pharmacy)
	0.9% Sodium chloride solution and pre-printed label
	Heparin Sodium 10 units/ml and pre-printed label
	Syringes
	Blunt fill and blunt fill filter needles
	2% Chlorhexidine Gluconate wipe
	Trust approved stopper to cap syringes

Procedure

1. Wash and dry hands thoroughly.
2. Obtain all the necessary equipment.
3. Draw up all drugs, flushing solution and Heparin Sodium 10 units/ml using appropriate syringes and blunt fill needles. Discard blunt fill needles, cap syringes with stopper and ensure that syringes are labelled.
4. Take prepared equipment to the child and explain the procedure.
6. Using part of the wipe pick up the end of the central line i.e. Smartsite valve. Thoroughly clean the valve with a Chlorhexidine wipe, allow to dry. *Scrub the hub*
7. Flush with correct flushing solution to check patency of the line.
8. Administer drugs over recommended time, flushing before and after each drug.
9. Heplock the line if required (see page 7).
10. Ensure the child is comfortable and that the line is secured.
11. Clear away all equipment, dispose of all items and document in notes according to hospital policy.

Appendix D:**PROCEDURE TO BE FOLLOWED WHEN HEPLOCKING A CENTRAL LINE**

<u>Equipment</u>	Injection tray
	Prescription chart
	0.9% Sodium chloride solution and pre-printed label
	Heparin Sodium 10 units/ml and pre-printed label
	Syringes
	Blunt fill and blunt fill filter needles
	2% Chlorhexidine Gluconate wipe
	Trust approved stoppers to cap syringes

Procedure

1. Wash and dry hands thoroughly.
2. Obtain all the necessary equipment.
3. Draw up 0.9% Sodium chloride and Heparin Sodium 10 units/ml using the appropriate blunt fill needles. Discard blunt fill needles, cap syringes with stopper. Ensure that syringes are labelled.
5. Take prepared equipment to the child and explain the procedure.
6. Using part of the wipe pick up the end of the central line i.e. Smartsite valve. Thoroughly clean the valve with a Chlorhexidine wipe, allow to dry. *Scrub the hub*
7. Flush the line with 5mls 0.9% Sodium chloride solution.
8. Flush the line with 4-5mls Heparin Sodium 10 units/ml. Whilst giving final 0.5-1ml, clamp the line, remove the syringe.
9. Ensure that the child is comfortable and the line is secured.
10. Clear away all equipment, dispose of all items and document in notes according to hospital policy.

Appendix E:**PROCEDURE TO BE FOLLOWED WHEN ACCESSING A PORT FOR ROUTINE FLUSHING**

<u>Equipment</u>	Dressing trolley Dressing pack 2% Chlorhexidine Gluconate wipes Sterile gloves Straight Hüber needle or Gripper needle of the correct size 10ml syringe and blunt fill filter needle Heparin Sodium 100 units/ml Plaster
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If prescribed, local anaesthetic cream must be applied in the appropriate timespan before the procedure.

Procedure

1. Clean the dressing trolley.
2. Obtain all the necessary equipment.
3. Explain the procedure to the child.
4. Wash and dry hands thoroughly.
5. Open the dressing pack and other necessary accessories. Open the Heparin Sodium 100 units/ml and open Chlorhexidine wipe packaging, drop wipes into gallipot.
6. Wash and dry hands, put on sterile gloves.
7. Draw up prescribed amount of Heparin Sodium 100 units/ml using blunt fill filter needle. Discard the blunt fill filter needle and fit syringe to the Hüber or Gripper needle extension and prime, expelling any air. Retain the needle and syringe on the sterile field.
8. Clean around the Port access site thoroughly using the Chlorhexidine wipe. Allow to dry. Place dressing towel under the Port access site.
9. Palpate and locate the Port and identify the latex injectable reservoir. Hold the Port securely and insert the Hüber/Gripper needle at an angle of 90⁰ to the skin, through the latex port until it meets the back plate of the Port. Withdraw the syringe plunger until blood is aspirated. Flush with the Heparin Sodium 100 units/ml, removing the needle whilst injecting the last 0.5ml of solution. Immobilise the Port with one hand while removing the needle.
10. Immediately press on the puncture site with a gauze swab.
11. Ensure that the child is comfortable, apply small plaster if required or requested by the child.

12. Clear away all equipment, dispose of all items and document procedure according to hospital policy.

Appendix F:

PROCEDURE TO BE FOLLOWED WHEN ACCESSING A PORT FOR USE

<u>Equipment</u>	Dressing trolley	Dressing pack
	Gripper needle of correct size	Sterile gloves
	10ml syringes	Blunt fill and blunt fill filter needles
	Needleless valve	0.9% Sodium chloride solution
	Trust approved semi permeable dressing	
	2% Chlorhexidine Gluconate wipes	Heparin Sodium 10 units/ml

If prescribed, local anaesthetic cream must be applied in a timely manner before the procedure.

Procedure

1. Clean dressing trolley.
2. Obtain all the necessary equipment.
3. Explain the procedure to the child.
4. Wash and dry hands.
5. Open dressing pack and other necessary accessories. Open Heparin Sodium 10 units/ml and 0.9% Sodium chloride, open Chlorhexidine wipe packaging, drop wipes into gallipot.
6. Wash hands and put on sterile gloves.
7. Connect the Smartsite valve to the Gripper needle extension. Draw up 0.9% Sodium Chloride and Heparin Sodium 10 units/ml using blunt fill and blunt fill filter needles. Discard these blunt fill needles, prime Gripper system with 0.9% Sodium chloride. Retain syringes within the sterile field ensuring that they are identifiable.
8. Clean around the Port access site thoroughly using Chlorhexidine wipes. Allow to dry. Place dressing towel under the Port.
9. Palpate and locate the Port and identify the latex injectable reservoir. Hold the Port securely and insert the Gripper needle at 90° to the skin, through the latex until it meets the back plate of the Port. Attach the syringe of 0.9% Sodium chloride via the Smartsite valve. Withdraw the syringe plunger until blood is aspirated, flush with 0.9% Sodium chloride. Heplock the system and ensure that the clamp is closed.
10. Cover the needle ensuring a loop of the extension set is coiled under a suitable dressing. Secure the extension set to the patients skin separate to the dressing to minimize accidental displacement if pulled.
11. Ensure that the child is comfortable.

12. Clear away all equipment, dispose of all items and document in notes according to hospital policy.

DRESSINGS

Dressings are used to - prevent contamination with extraneous matter,
- promote patient comfort,
- aid the secure fixation of the device,
- prevent children from interfering with the device.

Appendix G:

CENTRAL VENOUS LINES – CARE OF EXIT SITE

Introduction The exit site is a potential site of infection as it is a long term break in the skin's integrity. As a potential source of infection, the exit site requires careful monitoring and scrupulous hygiene.

The current policy for exit site care is:-

1. Sterile dressing change every 7 days.
2. Exit site cleaned with 2% Chlorhexidine Gluconate wipes. Except for neonates when 0.5% Chlorhexidine Gluconate solution must be used.
3. Trust approved semi permeable dressing dressing applied after cleaning.

Equipment Dressing trolley
Sterile dressing pack
2% Chlorhexidine Gluconate wipes (0.5% Chlorhexidine gluconate solution and gauze swabs for neonates)
Trust approved semi permeable dressing
Microbiology swabs if clinically indicated
Additional Mepore tape for securing the line

Procedure

1. Clean trolley and assemble prepared equipment.
2. Explain the procedure to the child and family.
3. Wash hands, open dressing pack, prepare all equipment.
4. Remove old dressing and discard in bag.
5. Examine exit site.
6. Take swabs for Microbiology if site looks infected e.g. red or oozing.
7. Wash and dry hands thoroughly.
8. Perform aseptic dressing using Chlorhexidine wipes (or Chlorhexidine soaked gauze swabs in neonates). Wipe round the exit site in a circular movement, from the exit site outwards for about 5cms.

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9. Clean the line with a fresh wipe, from the exit site down the line for about 10cms.
10. Allow the Chlorhexidine to dry.
11. Apply Trust approved semi permeable dressing over the exit site, ensuring good skin adhesion.
12. Apply a strip of suitable tape across a loop of the line 2-3cms below the main dressing.
13. Insert the hub of the line in a "wiggly" bag, if worn by the child.
14. Clear away used equipment. Discard used dressing equipment in a yellow clinical waste bag.
15. Document the care given in the nursing care plan.

Most children with CVLs will go home with them in situ. The dressing still needs to be done every 7 days. Some parents may wish to learn how to do the dressing, so nursing staff should teach them. When parents have been assessed as competent, they can do the dressing at home and during future hospital admissions if they wish.

Some parents may not want the responsibility of doing the dressing and should not be pressurised into doing it. In this case, the ward staff needs to make arrangements for the dressing to be done on clinic visits or at home by community nurses.

Appendix H:**PORTS – CHANGE OF A DRESSING**

The Gripper needle is covered and secured with an Trust approved semi permeable dressing. When a Port is in use the dressing only needs to be changed if it becomes soiled or there is a clinical indication. A planned needle change automatically ensures a new dressing.

<u>Equipment</u>	Dressing trolley	Sterile dressing pack
	Sterile gloves	
	Microbiology swabs	
	2% Chlorhexidine Gluconate wipes	
	Trust approved semi permeable dressing	

Procedure

1. Wash and dry hands thoroughly.
2. Clean trolley.
3. Gather necessary equipment, prepare pack.
4. Explain the procedure to the child.
5. Remove old dressing, taking care not to dislodge the Port needle.
6. Wash and dry hands thoroughly.
7. Assess site, take swabs for Microbiology if an infection is suspected.
8. If the site is clean and dry, apply Trust approved semi permeable dressing. If site appears contaminated, clean with Chlorhexidine wipes using a circular motion away from the needle. Allow to dry then apply new dressing.
9. Ensure the child is comfortable.
10. Clear away all equipment and dispose of all items according to hospital policy.

Appendix I:**LONG LINES and PICCs – CHANGE OF DRESSING**

The long line entry site is secured under Trust approved transparent semi permeable dressing for ease of observation. The Trust approved semi permeable dressing can remain in place for up to 7 days, but can be changed earlier if required. Care must be taken not to dislodge the long line. The catheter hub may be padded to ensure the child's comfort. The procedure for cleaning the site is the same as for CVLs (see page 10).

Appendix J:**GUIDELINES FOR OBTAINING BLOOD SPECIMENS VIA CENTRAL VENOUS CATHETERS**

Nurses authorised to undertake the procedure of obtaining blood specimens via central venous catheters will be on Part 8 or 15 of the Professional Register, Band 5 or above. They must be willing to undertake the role following training and will be identified and supported by their Ward Manager.

Training will consist of off-the-job theoretical input and practical demonstrations. It will be followed by a period of practice under supervision. Training will be facilitated by the Clinical Educators.

A competency package must be completed with the final assessments carried out by the Clinical Educator.

Nurses undertaking this role must be aware of the option of having Hepatitis B vaccination. Individuals who have queries should liaise with their Manager or Occupational Health for advice.

PROCEDURE TO BE FOLLOWED WHEN TAKING BLOOD SPECIMENS VIA CENTRAL LINES, TERMINATING WITH A NEEDLELESS VALVE

The information given below is guidance for ALL staff when taking blood specimens via central lines.

Equipment

The precise equipment needed will vary depending upon the specimens to be obtained, but will include:-

- Completed laboratory request forms
- Syringes, at least four 10ml syringes
- Blunt fill filter needles
- 0.9% Sodium chloride solution and pre-printed label
- Heparin Sodium 10 units/ml and pre-printed label
- Specimen bottles
- 2% Chlorhexidine Gluconate wipes
- Sterile gloves
- Trust approved stopper to cap syringes

Procedure

1. Collect all equipment.
2. Wash and dry hands thoroughly.
3. Draw up prescribed volumes of 0.9% Sodium chloride and Heparin Sodium 10 units/ml for flushing the line after the blood has been taken, using appropriate syringes and blunt fill needles. Discard blunt fill needles, cap syringes with stopper and label syringes.
4. Take prepared equipment to the child and explain the procedure.
5. Get the end of the line out ready for the procedure.

6. Open sterile gloves, open wipe packaging, empty wipes onto sterile glove field.
7. Wash and dry hands thoroughly, put on gloves.
8. Clean the valve thoroughly using a Chlorhexidine wipe. Allow to dry.
9. If obtaining blood specimens from a central line that is being used for an infusion, that infusion must be disconnected and the line flushed with 0.9% Sodium chloride. If the other lumen of a double lumen line is also connected to an infusion that line must be clamped shut before starting this procedure.
10. Ensure that the clamps are open. Using a 10ml syringe via the needlesless valve withdraw 3mls of blood. Discard this sample. **NB** if blood cultures are required, use this first sample for the cultures do not discard. In this case take at least 5mls.
11. Using a fresh empty syringe withdraw the appropriate volume of blood for the requested specimen(s). Flush the central line using the prepared syringe of 0.9% Sodium chloride.
12. Transfer the blood to the appropriate specimen containers, checking all patient details and mixing as recommended by the Pathology Department.
13. Heplock the central line following the guideline or recommence any infusions that were temporarily stopped.
14. Ensure that the child is comfortable and that the line is well secured.
15. Complete the labels on all specimen bottles clearly.
16. Clear away all equipment and dispose of all items according to hospital policy.
17. Arrange for the blood specimens to be transported to the relevant Pathology laboratories.

Appendix K:**PROCEDURE FOR DEALING WITH BLOCKED CENTRAL LINES**

If a central line is stiff to flush or unable to flush, the following steps should immediately be followed:-

1. Check that the clamps are open and the line is not kinked or twisted.
2. If it is a port, check that the needle has not become dislodged. If it has become dislodged, then the needle will have to be removed and the port re-accessed as soon as possible.
3. Attempt to flush the line with 0.9% Sodium chloride then Heplock as per Appendix D on page 7.
4. If the line still does not flush after these steps, report the problem to the medical staff and obtain a written prescription for Urokinase. (See Clinical Guideline No. 986 Central venous access device management).
5. Instil the Urokinase using procedure outlined in Appendix D, substituting Urokinase for Heparin Sodium.
6. Label the line stating that Urokinase is in situ plus the time and date it was instilled to prevent use of the line.
7. After a minimum of 2 hours, attempt to withdraw the Urokinase then flush the line with 0.9% Sodium Chloride and Heplock. If the line is still blocked, report back to the medical staff for advice.
8. Document the outcome in the child's nursing care plan.

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