Gloucestershire **NHS**
Primary Care Trust

Clinical Policies, Protocols, Guidelines and Procedures

Care and Management of Central Venous Catheters

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Care and Management of Central Venous Catheters

1.0 INTRODUCTION

1.1 The term Central Venous Catheter (CVC) refers to an intravenous catheter whose internal tip lies in a large central vein. Central Venous Catheters are used for medium to long-term venous access. These devices enable the administration of drugs, blood products, parenteral nutrition, sampling of blood and central venous pressure monitoring.

2.0 STATEMENT OF POLICY

2.1 This policy applies to all healthcare staff involved in the care and management of Central Venous Catheters.

2.2 All PCT staff dealing with Central Venous Catheters will do so in a manner which minimises the risk of infection and prevents cross infection

3.0 DEFINITION

3.1 This policy is a documented framework enabling individuals to carry out procedures, interventions and plans of care relating to the insertion and management of central venous catheters to ensure a safe outcome for the patient.

4.0 POLICY DETAILS

4.1 There are different types of CVC and it is important to establish which is being dealt with at any given time. These guidelines are applicable to all types of CVC. Differences in the management of types of CVC are specified in the text. A summary of the different types of CVC is provided below:

Type	Characteristics
Peripherally Inserted Central Catheter (PICC)	Inserted into the peripheral veins in the arm. Tip will be centrally placed usually in the Superior Vena Cava (SVC). PICCs are available as single and double lumen catheters, open ended or valved (see below). Used for long term access or when ambulatory treatment is given.
Tunnelled Catheter (TCVC) e.g. 'Groshong line' 'Hickman line' Cuffed or Uncuffed Leader catheter Hickman Apheresis used for stem cell collection	Inserted into a major vein, most commonly one of the subclavian veins. Less commonly will be inserted into a femoral vein. Will be tunnelled under the skin before exiting to provide security and a barrier to infection. May have one or two lumen and may be open-ended or valved (see below). Used for long term access or when ambulatory treatment is given.
Non-tunnelled catheter (short term, percutaneous) (Non-TCVC)	Inserted through the skin directly into a central vein such as the subclavian or jugular vein. Normally for shorter term use or for inpatient care only. May be single or multi lumen.
Haemodialysis or Hickman Apheresis Catheters (used for stem cell collection)	A large bore CVC inserted in a major vein, usually a subclavian. Used for patients receiving Peripheral Stem Cell Transplants or renal dialysis. May be tunnelled or non-tunnelled.

Totally Implanted Venous Access Devices (Port) **NOTE:** **These devises are not covered within the content of this policy. Please refer to GHNHSFT Insertion & Management of CVC's if further information is required.**	Inserted into internal/external jugular or subclavian vein by surgical cutdown. Catheter tip sits just above right atrium of the heart. The catheter is tunnelled under the skin and attached to the reservoir which is situated beneath the subcutaneous tissue on the chest wall. Used for patients with cystic fibrosis, cancer or haematological conditions and is for long term venous access.

4.2 Acronyms

Acronyms such as TCVC, have been used to clarify the identity of each of the different Central Venous Catheters and to minimise confusion.

4.3 The Groshong® Valve

This is a feature unique to CVCs manufactured by Bard Ltd. The tip of the catheter is closed. Access into the vascular system is via a slit in the side of the catheter which acts as a three way valve. In normal circumstances it opens outwards to allow fluid to be infused, it opens inwards to allow blood to be withdrawn and remains closed when neither positive or negative pressure are applied. CVCs with a Groshong® valve are easily identified because they have neither clamps nor switches to maintain a closed system.

4.4 Confirming Position

Before any CVC is used for the first time, it should be documented that the correct position of the tip has been confirmed. Position must be confirmed radiologically either at the time of insertion (e.g. image intensifier), following the procedure (e.g. chest x-ray) or a combination of the two. Advice must be sought about further x-ray confirmation if malposition is subsequently suspected.

4.5 Infection Control and Principles of Asepsis

- Procedures associated with CVC's have an associated risk of infection because of the potential for direct microbial entry to the bloodstream. Contamination may be by the patient's skin flora at the insertion site, or by the introduction of other organisms via the cannula hub or infection port.
- Risks can be minimised by strict adherence to the principles of aseptic non touch technique.
- An effective hand washing technique is the single most important factor in preventing cross infection. A no-touch technique is important in preventing contamination of sterile equipment or the patient. The most effective way of achieving this is through use of sterile gloves. All PCT staff should be conversant with the Hand Washing Policy.
- As recommended by EPIC 2 Guidelines, 2% Chlorhexidine Gluconate in 70% Isopropyl Alcohol should be used for skin cleaning prior and post CVC insertion and for cleaning the needle free devices prior to accessing the line. If any line is not compatible, 2% Aqueous solution must be used as an alternative.
- **Community Staff**: All procedures within this policy refer to cleaning surfaces with detergent wipes followed by alcohol wipes / spray. In the community when surfaces that can be damaged by alcohol such as wood have to be used to lay out dressings staff should ensure the surface is as clean as possible and use a sterile field to lay out equipment on.

Dressing a PICC

- **An aseptic non touch technique should be used at all times when undertaking care of the exit site.**
- It is common to see some bleeding from the exit site shortly after insertion. For this reason the dressing should be changed within the first 24 hours. If there is excessive bleeding the dressing should be taken down, absorbent dressing applied and covered with an occlusive dressing. Elevation and gentle pressure can help to stop persistent bleeding. Subsequent dressings can be changed weekly if using a moisture permeable occlusive transparent dressing such as Opsite IV3000™ unless the dressing is soiled, wet or detached. Sensitivity to occlusive dressings is a possibility. For these patients an alternative dressing such as sterile tape and gauze or Mepore can be used but it should be noted that these dressings are less resistant to water and will need changing daily. The use of a stat lock should be considered for stabilising the PICC, when Opsite cannot be used
- Cleansing of exit site should be carried out using 2% Chlorhexidine Gluconate in 70% isopropyl alcohol with an outward ‘single swipe’ motion removing any loose blood, exudates or other debris. The area should be dry before applying the new dressing.
- PICCs are held in place with Steri-strips which should be carefully removed and new ones applied at each dressing change.
- The exit site for PICCs should be inspected regularly for infection or inflammation using the visual phlebitis score on the core care plan. Changes should be documented and an appropriate course of action taken (see under complications).

Items required for dressing a PICC:

- Clean work surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, and then sprayed/wiped with alcohol and allowed to dry).
- Sterile dressing pack, or equivalent items – sterile gloves, sterile field, sterile gauze and galipot.
- 2% Chlorhexidine Gluconate in 70% isopropyl alcohol swab/s.
- Sachet of normal saline or alcohol swab.
- Replacement dressing such as Opsite IV3000™ or gauze and tape if allergic to Opsite IV3000™.
- Steri-strips (optional if CVC is sutured in place).

Procedure:

- Explain the procedure to the patient. Obtain and document informed consent according to Trust or local policy.
- Wash hands using a six stage technique with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (preferably liquid) and apply alcohol gel.
- Remove outer wrapper of dressing pack and place on clean surface.
- Remove the old dressing and discard. IV3000™ can be best removed by lifting edges. Then stretch and lift dressing from both sides from the bottom working upwards.
- Inspect the exit site and catheter length (either by noting the depth marks or by measuring the external portion of the PICC)
- Wash hands as above or apply alcohol gel.
- Open dressing pack and other items.
- Put on sterile gloves.
- Remove the suture wing and clean with saline or alcohol swab.
- Using 2% Chlorhexidine Gluconate in 70% isopropyl alcohol, clean around entry site of central line. Use each swab once only, wiping away from the entry site.
- Allow the skin to dry completely.

- Replace suture wing about 1cm away from exit site. Allow a small amount of slack in catheter between exit site and suture wing.
- Apply Steri-strips.
- Place new dressing over the site (if using IV3000™ ensure that the dressing adheres to the CVC itself).
- Ensure proper disposal of all waste, sharps and equipment.
- Complete documentation as necessary.

Maintaining Patency of a PICC

- All CVCs should be flushed regularly to maintain patency. For PICCs with two lumen, each should be flushed independently. The flushing solution for all Groshong® PICCs is usually 0.9% Sodium Chloride for injection (Saline). Some PICCs should be flushed with Saline but then 'locked' with a Heparinized solution (open-ended PICCs). This must be prescribed on a prescription chart indicating the strength and volume of Heparin. CVCs should be flushed with 10 mL normal saline following the administration of any drug or blood product. 20 mL normal saline should be used following the withdrawing of blood
- The frequency of flushing will depend on the type of PICC. Any PICC with the Groshong® valve is flushed routinely after use or at least every seven days. Non-valved PICCs will need to be flushed according to manufacturer's guidelines.
- Some practitioners hold the opinion that it is advisable to aspirate at least 5mL of blood before flushing. There is however evidence to suggest that such a practice can lead to blood or fibinous deposits within the line, and hasten line occlusions. Therefore whenever flushing a PICC with normal saline there is no need to aspirate blood first.
  Caution, Aspiration of blood to check patency of CVC is essential prior to administration of any drug or fluid.
- A brisk push-pause or pulsated flushing technique is used to create turbulence within the catheter and therefore reduce the possibility of fibrin and platelets building up on the internal walls of the CVC.
- The flushing technique ends whilst applying positive pressure. This can be achieved by either closing the clamp (if the PICC has one) during the last 0.5mL of flush or by removing the syringe from the needle free device whilst injecting the last 0.5mL.
- If disconnecting an infusion it is advisable to give a bolus flush even if the solution is saline to allow the technique described above to be used.
- Syringes smaller than 10mL should not be used on any CVC unless approved by the manufacturer. Small syringes can crease excessive amounts of internal pressure and can lead to rupture of the catheter.

Flushing a PICC

Items Required

- Clean work surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, then sprayed/wiped with alcohol and allowed to dry)
- Ampoule/s of normal saline.
- 2% Chlorhexidine Gluconate in 70% isopropyl alcohol swab/s.
- 70% isopropyl alcohol swab/s.
- 1 x 10mL syringes for each lumen.
- Needle for drawing up saline.
- Sterile dressing pack (or equivalent items – sterile gloves, sterile field, sterile gauze and galipot).
- Sharps bin.

Procedure

- **This is an aseptic non touch technique:**
- Explain the procedure to the patient. Obtain and document informed consent according to Trust or local policy.
- Remove the outer wrapper of dressing pack and place on clean surface.
- Wash hands using a six stage technique with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (liquid if possible) and apply alcohol gel.
- Open dressing pack and other items. Clean saline ampoule with alcohol swab, remove top and place on the corner of sterile field.
- Wash hands as above or apply alcohol gel.
- Put on sterile gloves and draw up saline without touching ampoule(s).
- Place sterile field under PICC.
- Clean the needle free device with 2% Chlorhexidine Gluconate in 70% isopropyl alcohol thoroughly for 30 seconds and allow to dry completely.
- Attach syringe containing saline and flush as per guidelines (see principles above).
- Re-clean needle free device with 2% Chlorhexidine in 70% isopropyl alcohol.
- For multiple lumen PICCs repeat the previous 3 steps.
- Discard all waste safely in accordance with Trust policy.
- Complete documentation as necessary.

Taking Blood Samples from a PICC

- On PICCs with multiple lumens, the largest (often colour-coded red) is usually the most suitable for taking blood samples. It is not necessary to remove the needle free device prior to blood sampling.
- For blood sampling from a PICC a minimum of 10mL of blood is withdrawn and discarded before withdrawing the require volume for laboratory tests. This is to prevent contamination of samples by flushing solution. The exception to this is when blood is being withdrawn for blood cultures when catheter related infection is suspected.
- Vacuum blood collection systems should be used in drawing blood from PICCs. If unsuccessful, it may be necessary to use syringes and the Vacuette® Blood Transfer Unit. **A needle and syringe must not be used**.
  Note: Antibiotic assays must not be taken from the CVC as this is the route of administration.

Items Required

- Clean work surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, then sprayed/wiped with alcohol and allowed to dry)
- Pathology Request Forms as appropriate.
- 2 x 10mL syringe and 1 x 20mL syringe.
- Needle for drawing up saline.
- 2% Chlorhexidine Gluconate in 70% isopropyl alcohol swab/s
- 70% isopropyl alcohol swab/s.
- A 10mL ampoule of 0.9% normal saline.
- Sterile dressing pack (or equivalent items – sterile gloves, sterile field, sterile gauze and galipot).
- Blood bottles.
- Vacuette® Holdex device or Vacuette® Blood Transfer Unit and 20mL syringe.
- Sharps bin.

Procedure

- **This is an aseptic non touch technique.**
- Stop all infusions except inotropes (including TPN) for 15 minutes prior to sample aspiration.

- Calculate the amount of blood required to fill the sample bottles.
- Explain the procedure to the patient. Obtain and document informed consent according to Trust or local policy.
- Remove outer wrapper of dressing pack and place on clean surface.
- Wash hands using a six stage technique with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (preferably liquid) and apply alcohol gel.
- Open dressing pack and other items. Clean saline ampoule with alcohol swab, remove top and place on the corner of sterile field.
- Wash hands as above or apply alcohol gel.
- Put on sterile gloves and draw up saline without touching ampoule.
- Place sterile field under PICC.
- Clean the needle free device thoroughly with 2% Chlorhexidine Gluconate in 70% isopropyl alcohol for 30 seconds and allow to dry completely.
- Attach empty syringe and aspirate 10mL blood and discard (NB omit this step when taking cultures).
- Attach Vacuette® Holdex device and insert appropriate blood bottles. If unsuccessful withdraw blood sample using 20mL syringe and transfer blood into blood bottles using Vacuette® Blood Transfer Unit.
- Clean needle free device again for 30 seconds again with 2% Chlorhexidine Gluconate in 70% isopropyl alcohol to remove residual traces of blood.
- Attach syringe containing saline and flush as per guidelines (see above).
- If syringe used for blood withdrawal, insert into blood bottles using Vacuette® Blood Transfer Unit. **(DO NOT USE A NEEDLE IN THIS PROCESS)**
- Label all the blood bottles at the patient's bedside.
- Dispose of all waste safely in accordance with Trust policy.

Removal of PICCs

- PICCs can be removed by nurses competent in the management of CVCs. Prior to removal, the patient's platelet count must be checked and the CVC exit site cleaned with 2% Chlorhexidine in 70% isopropyl alcohol. Using an aseptic technique, gentle traction is applied following the removal of the dressing and steri-strips.
- If there is difficulty removing the PICC the patient should be laid down with the arm at a right angle to the body and further traction applied. If this fails, apply heat to the upper part of the arm whilst applying traction to the PICC, secure it with tape and leave for thirty minutes before making a further attempt to remove it.
- Any CVC being removed should be inspected to check that the entire catheter has been removed.
- The tip of the catheter must be cut off using sterile scissors, placed in a universal container and sent to Microbiology.
- Details of PICC removal must be recorded in the appropriate nursing and/or medical notes.

Recognition of Complications and Troubleshooting

- All PICCs have potential complications and commonly occurring problems should be discussed with the patient before insertion.
- Management of PICCs should be directed at minimising the risk of complications and early identification of their signs.
- Intra-luminal colonisation of PICCs can lead to life-threatening **bacteraemia**. All patients, but particularly those likely to become immuno-compromised, should be advised to report promptly any signs of infection such as fever and malaise.
- **Infection** can also occur around the exit site (where the catheter exits the skin). PICCs should be inspected regularly (at least at each dressing change and daily if the patient is acutely unwell) for signs of infection such as erythema, discomfort, discharge. Note that pus may be absent in immuno-compromised patients. Routine observations of temperature and pulse should be recorded in hospital as a minimum.

Details of inspection and any changes must be documented in the CVC care plan.

- If a PICC related infection is suspected it is usual practice to take blood cultures from each lumen of the catheter and peripherally. Blood should not be discarded first if being taken for this purpose. Medical advice should be sought if PICC related infection is suspected.
- The patient's clinical condition will determine whether a PICC is removed because of infection. If it is removed the tip should be sent to Microbiology for culture.
- **Occlusion** of PICCs can be either extraluminal (outside of the catheter) or intraluminal (inside)
- Extraluminal occlusion is likely when it is possible to infuse or flush through the PICC but it is not possible to aspirate blood. This is sometimes referred to as 'persistent withdrawal occlusion' (PWO). PWO can be due to malposition of the PICC and an x-ray may be necessary to confirm position. More likely is the formation of a fibrin sheath which occurs in the majority of PICCs in situ.
- Attempts can be made to resolve PWO by first flushing the PICC, then (if appropriate) ask the patient to raise both arms above their head and/or take deep breaths/cough whilst an attempt is made to aspirate. Changing the position of the patient will sometimes work. Larger syringes can be used up to and including 50mL. If these measures are unsuccessful advice should be sough about the use of fibrinolytic drugs (e.g. Synerkinase).
- Intrauminal occlusion usually occurs because of clotted blood in the PICC but can also occur due to drug precipitation. Excessive force should not be used if resistance is felt during an attempt to flush a PICC. Advice should be sought about the use of fibrinolytic drugs (e.g. Synerkinase).

  Note: If there is any doubt about the patency of the CVC, cytotoxic drugs or any other drugs must not be administered.
- **Thrombosis** can occur in a matter of days of PICC insertion and staff need to be aware of this possibility. Symptoms indicating possible PICC related thrombosis include pain in the shoulder or arm, swelling of one limb, distension of local venous system, skin discolouration. Medical attention/advice should be sought if thrombosis is suspected. Venograms are often performed to confirm the diagnosis and anticoagulant therapy is commenced. Oncology patients are often given Warfarin as prophylactic therapy for potential thrombosis because they are considered a 'high risk' group.
- Mechanical **phlebitis** is most common in patients with PICCs and presents most often within the first seven days following insertion. The arm becomes sore, red and hot. There can be some swelling present. In severe cases a hard venous 'cord' can be felt above the exit site. In most cases presenting in the first week there is no infective element and antibiotics are not indicated. Most cases will resolve with the application of heat to the affected arm for 20 minutes 3-4 times a day. Sometimes non-steroidal inflammatory drugs may be prescribed. Advice from a competent practitioner should be sought in all cases.
- Infective phlebitis is identified by the presence of exudates at the exit site.
- Chemical phlebitis/extravastion is less likely in patients with a CVC than those receiving treatment peripherally but it should not be completely ruled out. Likely causes are catheter damage, fibrin sheath formation or malposition of the CVC.

Catheter Damage

- The risk of damage to PICCs can be minimised by avoiding:
  - The use of sharp instruments
  - Stretching or twisting the catheter
  - Excessive amounts of force when administering solutions
- Many PICCs with external damage can be repaired. Seek specialist advice.
- If damage occurs to CVCs the catheter should be clamped on the patient side of the damage to prevent air embolism. Damaged catheters may need to be wrapped in sterile dressing (e.g. gauze) to reduce the risk of infection. Ideally the catheter should be secured to prevent the line tracking into the vein.

Catheter Migration

- It is possible for any PICC to become dislodged from its original position. Vigilance is required to ensure that any movement of the catheter is detected. This can be achieved by being aware of the catheter length at insertion (some PICCs are actually marked in centimetres for depth) and noting this at regular intervals. An ideal time is at dressing changes. The patient should also be educated to be aware of this problem.
- If catheter migration is noted or suspected, a repeat chest x-ray may be necessary to confirm satisfactory position.

Tunnelled Central Venous Catheters

Dressing a Tunnelled CVC

- **An aseptic non touch technique should be used at all times when undertaking care of the exit site.**
- It is common to see some bleeding from the exit site shortly after insertion. For this reason the dressing should be changed within the first 24 hours. If there is excessive bleeding the dressing should be taken down, absorbent dressing applied and covered with an occlusive dressing. Gentle pressure can help to stop persistent bleeding. Subsequent dressings can be changed weekly using Opsite IV3000™ unless the dressing is soiled, wet or detached. Sensitivity to occlusive dressings is a possibility. For these patients an alternative dressing such as sterile tape and gauze or Mepore can be used but it should be noted that these dressings are less resistant to water and may need changing more frequently.
- Cleansing of exit site should be carried out using 2% Chlorhexidine Gluconate in 70% isopropyl alcohol with an outward 'single swipe' motion removing any loose blood, exudates or other debris. The area should be dry before applying the new dressing.
- Tunnelled catheters are held in situ with sutures. These should only be removed on the advice of a senior health professional with appropriate experience and knowledge. Normally the upper suture over the insertion site into the vein should be removed at 7 – 10 days and the lower one at the exit site should be removed after 21 days. This will have allowed time for the DACRON cuff to secure to the dermis layer. Recent evidence supports the use of securing devices (e.g. skin fixation devices)
- The exit site for all CVCs should be inspected regularly for infection and inflammation. Changes should be documented in the CVC care plan and an appropriate course of action taken (see under complications).

Items Required:

- Clean work surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, then sprayed/wiped with alcohol and allowed to dry).
- Sterile dressing pack, or equivalent items – sterile gloves, sterile field, sterile gauze and galipot.
- 2% Chlorhexidine Gluconate in 70% isopropyl alcohol swab/s
- Replacement dressing (Opsite IV3000™ or gauze and tape if allergic to Opsite IV3000™).

Procedure

- Explain the procedure to the patient. Obtain and document informed consent according to Trust or local policy.
- Wash hands using a six stage technique with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (liquid if possible) and apply alcohol gel.
- Remove outer wrapper of dressing pack and place on clean surface.

- Remove the old dressing and discard. IV3000™ can be best removed by lifting edges. Then stretch and lift dressing from both sides from the bottom working upwards.
- Inspect the exit site.
- Wash hands as above or apply alcohol gel.
- Open dressing pack and other items.
- Put on sterile gloves.
- Using 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol, clean around entry site of central line. Use each swab once only, wiping away from the entry site.
- Allow the skin to dry completely.
- Place new dressing over the site (if using IV3000™ ensure that the dressing adheres to the CVC itself).
- Dispose of all waste as per trust policy.
- Complete documentation as necessary.

Maintaining Patency of a Tunnelled CVC.

- All CVCs should be flushed regularly to maintain patency. For CVCs with two or more lumen, each should be flushed independently. The flushing solution for all CVCs is usually 0.9% Sodium Chloride for injection (Saline). Some CVCs should be flushed with Saline but then 'locked' with a Heparinized solution (e.g. Haemodialysis and Hickman catheters). This must be prescribed on a prescription chart indicating the strength and volume of Heparin. CVCs should be flushed following the administration of any drug, blood product and the withdrawing of blood (10mL saline).
- The frequency of flushing will depend on the type of CVC. Any CVC with the Groshong® valve is flushed routinely every seven days. Non-valved CVC in the acutely ill, hospitalised patient should be flushed at least daily.
- Some practitioners hold the opinion that it is advisable to aspirate at least 5mL of blood before flushing. There is however evidence to suggest that such a practice can lead to blood or fibinous deposits within the line, and hasten line occlusions. Therefore whenever flushing a tunnelled CVC with normal saline there is no need to aspirate blood first. **Caution – Aspiration of blood to check patency of CVC is essential prior to administration of any drug or fluid**.
- A brisk push-pause or pulsated flushing technique is used to create turbulence within the catheter and therefore reduce the possibility of fibrin and platelets building up on the internal walls of the CVC.
- The flushing technique ends whilst applying positive pressure. This can be achieved by either closing the clamp (if the CVC has one) during the last 0.5mL of flush or by removing the syringe from the needle free device whilst injecting the last 0.5mL.
- If disconnecting an infusion it is advisable to give a bolus flush even if the solution is saline to allow the technique described above to be used.
- Syringes smaller than 10mL should not be used on any CVC unless approved by the manufacturer. Small syringes can crease excessive amounts of internal pressure and can lead to rupture of the catheter.

Flushing a Tunnelled CVC

Items Required

- Clean work surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, then sprayed/wiped with alcohol and allowed to dry).
- 2% Chlorhexidine Gluconate in 70% isopropyl alcohol swab/s.
- Ampoule/s of normal saline.
- 70% isopropyl alcohol swab/s.
- 1 x 10mL syringes for each lumen.
- Needle for drawing up saline.
- Sterile dressing pack (or equivalent items – sterile gloves, sterile field, sterile gauze and galipot).

Procedure

- **This is an aseptic non touch technique.**
- Explain the procedure to the patient. Obtain and document informed consent according to Trust or local policy.
- Remove the outer wrapper of dressing pack and place on clean surface.
- Wash hands using a six stage technique with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (preferably liquid) and apply alcohol gel.
- Open dressing pack and other items. Clean saline ampoule(s) with alcohol swab, remove top and place on the corner of sterile field.
- Wash hands as above or apply alcohol gel.
- Put on sterile gloves and draw up saline without touching ampoule(s).
- Place sterile field under CVC.
- Clean the needle free device thoroughly with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol for 30 seconds and allow to dry completely.
- Attach syringe containing saline and flush as per guidelines (see principles above).
- Reclean needle free device with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol for 30 seconds.
- For multiple lumen CVCs repeat the previous 3 steps.
- Discard all waste safely in accordance with Trust policy.

Taking Blood Samples from a Tunnelled CVC.

- On CVCs with multiple lumens, the largest (often colour-coded red) is usually the most suitable for taking blood samples. It is not necessary to remove needle free devices prior to blood sampling.
- Generally for blood sampling from a CVC a minimum of 10mL of blood is withdrawn and discarded before withdrawing the require volume for laboratory tests. This is to prevent contamination of samples by flushing solution. The exception to this is when blood is being withdrawn for blood cultures when catheter related infection is suspected. Vacuum blood collection systems should be used in drawing blood from CVC's. If unsuccessful, it may be necessary to use syringes and the Vacuette® blood transfer unit. **A needle and syringe must not be used.**
  Note: Antibiotic assays must not be taken from the CVC as this is the route of administration.

Items Required

- Clean Work Surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, then sprayed/wiped with alcohol and allowed to dry).
- Pathology Request Forms as appropriate.
- 2 x 10mL syringe and 1 x 20mL syringe.
- Needle for drawing up saline.
- 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol swab/s.
- 70% isopropyl alcohol swabs.
- An ampoule of normal saline.
- Sterile dressing pack (or equivalent items – sterile gloves, sterile field, sterile gauze and galipot).
- Blood bottles.
- Vacuette® Holdex device or Vacuette® Blood Transfer Unit.
- Sharps bin.

Procedure

- **This is an aseptic non touch technique.**
- Stop all infusions (including TPN) for 15 minutes prior to sample aspiration.
- Calculate the amount of blood required to fill the sample bottles.
- Explain the procedure to the patient. Obtain and document informed consent according to Trust or local policy.
- Remove outer wrapper of dressing pack and place on clean surface.
- Wash hands using a six stage technique with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (preferably liquid) and apply alcohol gel.
- Open dressing pack and other items. Clean saline ampoule with alcohol swab, remove top and place on the corner of sterile field.
- Wash hands as above or apply alcohol gel.
- Put on sterile gloves and draw up saline without touching ampoule.
- Place sterile field under CVC.
- Clean the needle free device thoroughly with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol for 30 seconds and allow to dry completely.
- Attach empty syringe and aspirate 10mL blood and discard (NB omit this step when taking cultures).
- Attach Vacuette Holdex® device and insert appropriate blood bottles. If unsuccessful, withdraw blood sample using 20mL syringe and transfer blood into blood bottles using Vacuette® Blood Transfer Unit.
- Clean needle free device again for 30 seconds with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol to remove residual traces of blood.
- Attach syringe containing saline and flush as per guidelines (see above).
- If syringe used for blood withdrawal, insert into blood bottles using Vacuette® Blood Transfer Unit. **Do not use a needle in this process.**
- Label all the blood bottles at the patient's bedside.
- Dispose of all waste safely in accordance with Trust policy.

Removal of Tunnelled CVC

- In adults tunnelled CVCs require a minor surgical procedure to remove them using local anaesthetic and should only be performed by a doctor. For paediatrics the procedure requires a general anaesthetic and is undertaken at Bristol Children's Hospital.
- The exit site should be cleaned with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol to prevent accidental contamination.
- The platelet count must be checked prior to this procedure.
- Any CVC being removed should be inspected to check that the entire catheter has been removed. The tip of the catheter must be cut off using sterile scissors, placed in a universal container and sent to Microbiology.
- Details of CVC removal must be recorded in the appropriate nursing and/or medical notes.

Recognition of Complications and Troubleshooting

- All CVCs have potential complications and commonly occurring problems should be discussed with the patient before insertion.
- Management of CVCs should be directed at minimising the risk of complications and early identification of their signs.
- Intra-luminal colonisation of CVCs can lead to life-threatening **bacteraemia**. All patients, but particularly those likely to become immuno-compromised, should be advised to report promptly any signs of infection such as fever and malaise.
- **Infection** can also occur around the exit site (where the catheter exits the skin). In case of tunnelled CVCs infection can also present subcutaneously. CVCs should be inspected regularly (at least at each dressing change and daily if the patient is acutely unwell) for signs of infection such as erythema, discomfort, discharge, In hospital

daily observations of temperature and pulse should be recorded as a minimum. Note that pus may be absent in immuno-compromised patients. Any changes must be documented in the CVC core care plan.

- If a CVC related infection is suspected it is usual practice to take blood cultures from each lumen of the catheter and peripherally. Blood should not be discarded first is being taken for this purpose. Medical advice should be sought if CVC related infection is suspected.
- The patient's clinical condition will determine whether a CVC is removed because of infection. If it is removed the tip should be sent to Microbiology for culture.
- **Occlusion** of CVCs can be either extraluminal (outside of the catheter) or intraluminal (inside)
- Extraluminal occlusion is likely when it is possible to infuse or flush through the CVC but it is not possible to aspirate blood. This is sometimes referred to as 'persistent withdrawal occlusion' (PWO). PWO can be due to malposition of the CVC and an x-ray may be necessary to confirm position. More likely is the formation of a fibrin sheath which occurs in the majority of CVCs in situ for more than 7 days.
- Attempts can be made to resolve PWO by first flushing the CVC, then (if appropriate) ask the patient to raise both arms above their head and/or take deep breaths/cough whilst an attempt is made to aspirate. Changing the position of the patient will sometimes work. Larger syringes can be used up to and including 50mL. If these measures are unsuccessful advice should be sough about the use of fibrinolytic drugs (e.g. Synerkinase).
- Intrauminal occlusion usually occurs because of clotted blood in the CVC but can also occur due to drug precipitation. Excessive force should not be used if resistance is felt during an attempt to flush a CVC. Advice should be sought about the use of fibrinolytic drugs (e.g. Synerkinase).
- **Thrombosis** can occur in a matter of days of CVC insertion and staff need to be aware of this possibility. Symptoms indicating possible CVC related thrombosis include pain in the shoulder or arm, swelling of one limb, distension of local venous system, skin discolouration. Medical attention/advice should be sought if thrombosis is suspected. Venograms are often performed to confirm the diagnosis and anticoagulant therapy is commenced. Oncology patients are often given Warfarin as prophylactic therapy for potential thrombosis because they are considered a 'high risk' group.
- Chemical phlebitis/extravastion is less likely in patients with a CVC than those receiving treatment peripherally but it should not be completely ruled out. Likely causes are catheter damage, fibrin sheath formation or malposition of the CVC.

Catheter Damage

- The risk of damage to CVCs can be minimised by avoiding:
    - The use of sharp instruments
    - Stretching or twisting the catheter
    - Excessive amounts of force when administering solutions
- Many CVCs with external damage can be repaired and specialist advice should be sought.
- If damage occurs to CVCs the catheter should be clamped on the patient side of the damage to prevent air embolism. Damaged catheters may need to be wrapped in sterile dressing (e.g. gauze) to reduce the risk of infection.

Catheter Migration

- It is possible for any CVC to become dislodged from its original position. Vigilance is required to ensure that any movement of the catheter is detected. This can be achieved by being aware of the catheter length at insertion (some CVCs are actually marked in centimetres for depth) and noting this at regular intervals. An ideal time is at dressing changes. The patient should also be educated to be aware of this problem.

- If catheter migration is noted or suspected, a repeat chest x-ray may be necessary to confirm satisfactory position.

Hickman Apheresis / Haemodyalisis Catheters (AC)

Dressing a Tunnelled AC

- **An aseptic non touch technique should be used at all times when undertaking care of the exit site.**
- It is common to see some bleeding from the exit site shortly after insertion. For this reason the dressing should be changed within the first 24 hours. If there is excessive bleeding the dressing should be taken down, absorbent dressing applied and covered with an occlusive dressing. Gentle pressure can help to stop persistent bleeding. Subsequent dressings can be changed weekly using Opsite IV3000™ unless the dressing is soiled, wet or detached. Sensitivity to occlusive dressings is a possibility. For these patients an alternative dressing such as sterile tape and gauze or Mepore can be used but it should be noted that these dressings are less resistant to water and may need changing more frequently. Patients receiving renal dialysis will have their line dressed with MEFIX, which will be replaced at each dialysis session.
- Cleansing of exit site should be carried out using 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol with an outward 'single swipe' motion removing any loose blood, exudates or other debris. The area should be dry before applying the new dressing.
- **Solutions containing alcohol may be contraindicated for use in cleaning haemodyalisis / apheresis catheters and should be used as per manufacturer's guidelines**.
- ACs are held in situ with sutures. The upper sutures over the insertion site into the vein should be removed at 7 days and the lower one at the exit point should be removed after 21 days. Recent evidence supports the use of a securing device (e.g. skin fixation device) These should not be removed. The exit site for all CVCs should be inspected regularly for infection and inflammation. Changes should be documented and an appropriate course of action taken (see under complications).

Items Required:

- Clean work surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, then sprayed/wiped with alcohol and allowed to dry).
- Sterile dressing pack, or equivalent items – sterile gloves, sterile field, sterile gauze and galipot.
- 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol swab/s.
- Replacement dressing (Opsite IV3000™ or mefix for dialysis lines) Gauze and tape should be used if allergic to these dressings.

Procedure

- Explain the procedure to the patient. Obtain and document informed consent as per trust or local policy.
- Wash hands using a six stage technique with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (preferably liquid) and apply alcohol gel.
- Remove outer wrapper of dressing pack and place on clean surface.
- Remove the old dressing and discard. IV3000™ can be best removed by lifting edges. Then stretch and lift dressing from both sides from the bottom working upwards.
- Inspect the exit site.
- Wash hands as above or apply alcohol gel.
- Open dressing pack and other items.
- Put on sterile gloves.
- (Remove the suture wing if one is present and it is not sutured).

- Using 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol, clean around entry site of central line. Use each swab once only, wiping away from the entry site.
- Allow the skin to dry completely.
- Place new dressing over the site (if using IV3000™ ensure that the dressing adheres to the CVC itself).
- Complete documentation as necessary.

Maintaining Patency of an AC

- All ACs should be flushed regularly to maintain patency. For ACs with two or more lumen, each should be flushed independently. The flushing solution for all ACs is usually 0.9% Sodium Chloride for injection (Saline) followed by a 'lock' of **Monoparin** Heparin 5000 units per mL or **Citra lock™** for Haemo dialysis catheters. The volume used will depends on the size of the lumen which is usually indicated on the side of the catheter hub (e.g. '1.6mL'). These drugs must be prescribed on a prescription chart indicating the strength and volume of Heparin and Citra lock™. ACs should be flushed following the administration of any drug, blood product and the withdrawing of blood. The frequency of flushing will normally be at least weekly.
  Note: As Monoparin Heparin does not contain a preservative the remaining contents of the ampoule must be discarded.
- It is advisable to aspirate at least 10mL of blood before flushing to remove the Heparin / Citra lock™ sitting in each lumen. This may not be always possible due to withdrawal occlusion. The PCT has adopted a realistic approach to this; to try aspiration first but accept that in many cases this will not be possible and that flushing can still be carried out (see section below on occlusion).
- A brisk push-pause or pulsated flushing technique is used to create turbulence within the catheter and therefore reduce the possibility of fibrin and platelets building up on the internal walls of the AC. This is not required when administering the Heparin or Citra lock.
- The flushing technique ends whilst applying positive pressure. This can be achieved by closing the clamp during the last 0.5mL of flush.
- If disconnecting an infusion it is advisable to give a bolus flush even if the solution is saline to allow the technique described above to be used.
- Syringes smaller than 10mL should not be used on any AC unless approved by the manufacturer. Small syringes can crease excessive amounts of internal pressure and can lead to rupture of the catheter.

Flushing an AC

Items Required

- Clean Work Surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, then sprayed/wiped with alcohol and allowed to dry).
- Ampoule/s of normal saline.
- Monoparin Heparin 5000 units/ml or Citra lock™ for renal lines (as prescribed).
- 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol swab/s.
- 70% isopropyl alcohol swab/s.
- 3 x 10mL syringes for each lumen.
- 2mL syringe for each lumen.
- Needles for drawing up saline and Monoparin Heparin or Citra lock™ for renal lines.
- Sterile dressing pack (or equivalent items – sterile gloves, sterile field, sterile gauze and galipot).
- Sharps bin.

Procedure

- **This is an aseptic non touch technique**.
- Explain the procedure to the patient. Obtain and document informed consent as per trust or local policy.
- Remove the outer wrapper of dressing pack and place on clean surface.
- Wash hands with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (preferably liquid) and apply alcohol gel.
- Open dressing pack and other items. Clean saline ampoule(s) with alcohol swab, remove top and place on the corner of sterile field.
- Clean Monoparin Heparin / Citra lock ampoule with alcohol wipe and place on corner of sterile field.
- Wash hands as above or apply alcohol gel.
- Put on sterile gloves and draw up saline without touching ampoule(s).
- Draw up Monoparin Heparin / Citra lock™ in 2mL syringe to required volume (see AC line for amount).
- Transfer Monoparin Heparin / Citra lock™ to 10mL syringe.
- Place sterile field under AC.
- Clean the needle free device thoroughly with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol for 30 seconds and allow to dry completely.
- Attach empty syringe, open clamp and attempt aspiration of 10mL blood (see principles above). Close clamp.
- Remove syringe.
- Attach syringe containing saline, open clamp and flush as per guidelines (see principles above). Close clamp. Remove syringe.
- Attach Monoparin Heparin syringe / Citra lock™, open clamp, inject and close clamp.
- Reclean the needle free device thoroughly with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol for 30 seconds and allow to dry completely.
- For multiple lumen ACs repeat the previous 6 steps.
- Discard all waste safely in accordance with Trust policy.

Taking Blood Samples from a Tunnelled AC

- On ACs with multiple lumens, the largest (often colour-coded red) is usually the most suitable for taking blood samples. It is not necessary to remove the needle free device prior to blood sampling.
- Generally for blood sampling from an AC a minimum of 5mL of blood is withdrawn and discarded before withdrawing the require volume for laboratory tests. This is to prevent contamination of samples by flushing solution. The exception to this is when blood is being withdrawn for blood cultures when catheter related infection is suspected.
- Vacuum blood collection systems should be used in drawing blood from AC's. If unsuccessful, it may be necessary to use syringes and the Vacuette ® blood transfer unit. **A needle and syringe must not be used.**
  Note: Antibiotic assays must not be taken from the AC's as this is the route of administration.

Items Required

- Clean Work Surface (such as dressing trolley, instrument tray or work top cleaned with detergent wipe, allowed to dry, then sprayed/wiped with alcohol and allowed to dry).
- Pathology Request Forms as appropriate.
- 3 x 10mL syringe and 1 x 20mL syringe.
- Needles for drawing up saline and Heparin.
- 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol swab/s
- 70% isopropyl alcohol swab/s.
- An ampoule of normal saline.

- Monoparin Heparin 5000 units/ml / Citra lock™
- Sterile dressing pack (or equivalent items – sterile gloves, sterile field, sterile gauze and galipot).
- Blood bottles.
- Vacuette ® Holdex Device or Vacuette ® Blood Transfer Set
- Sharps bin.
-

Procedure

- **This is an aseptic non touch technique.**
- Stop all infusions (including TPN) for 15 minutes prior to sample aspiration.
- Calculate the amount of blood required to fill the sample bottles.
- Explain the procedure to the patient.
- Remove outer wrapper of dressing pack and place on clean surface.
- Wash hands using a six stage technique with an antiseptic solution e.g. hibiscrub. In the community if an antiseptic solution is not available clean with soap (preferably liquid) and apply alcohol gel.
- Open dressing pack and other items. Clean saline ampoule with alcohol swab, remove top and place on the corner of sterile field.
- Clean Monoparin Heparin / Citra lock™ ampoule with alcohol wipe and place on corner of sterile field.
- Wash hands as above or apply alcohol gel.
- Put on sterile gloves and draw up saline without touching ampoule(s).
- Draw up Monoparin Heparin / Citra lock™ in 2mL syringe to required volume.
- Transfer Monoparin Heparin / Citra lock™ to 10mL syringe.
- Place sterile field under AC.
- Clean the needle free device thoroughly with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol solution for 30 seconds and allow to dry completely.
- Attach empty syringe, open clamp and attempt aspiration of 5mL blood, Discard unless taking blood cultures.
- Attach Vacuette® Holdex device and insert appropriate blood bottles. If unsuccessful withdraw blood sample using 20 mL syringe and transfer blood into blood bottles using Vacuette® Blood transfer unit.
- Clean needle free device again with a new swab to remove residual traces of blood.
- Attach syringe containing saline, open clamp and flush as per guidelines (see principles above). Close clamp. Remove syringe.
- Label all the blood bottles and instil the blood into the bottles, using a needle-less technique.
- Dispose of all waste safely in accordance with Trust policy.

Removal of AC's

- The platelet count must be checked prior to this procedure and the exit site must be cleaned with 2% Chlorhexidine Gluconate in 70% Isopropyl alcohol to prevent accidental contamination.
- Following removal of the CVC the tip must be inspected for entire removal and then the tip of the catheter must be cut off using sterile scissors, placed in a universal container and sent to Microbiology.

Recognition of Complications and Troubleshooting

- All CVCs have potential complications and commonly occurring problems should be discussed with the patient before insertion.
- Management of CVCs should be directed at minimising the risk of complications and early identification of their signs.
- Intra-luminal colonisation of CVCs can lead to life-threatening **bacteraemia**. All patients, but particularly those likely to become immuno-compromised, should be advised to report promptly any signs of infection such as fever and malaise.

- **Infection** can also occur around the exit site (where the catheter exits the skin). In case of tunnelled CVCs infection can also present subcutaneously. CVCs should be inspected regularly (at least at each dressing change and daily if the patient is acutely unwell) for signs of infection such as erythema, discomfort, discharge, In hospital daily observations of temperature and pulse should be recorded as a minimum. Note that pus may be absent in immuno-compromised patients. Any changes must be documented in the CVC core care plan.
- If a CVC related infection is suspected it is usual practice to take blood cultures from each lumen of the catheter and peripherally. Blood should not be discarded first is being taken for this purpose. Medical advice should be sought if CVC related infection is suspected.
- The patient's clinical condition will determine whether a CVC is removed because of infection. If it is removed the tip should be sent to Microbiology for culture.
- **Occlusion** of CVCs can be either extraluminal (outside of the catheter) or intraluminal (inside)
- Extraluminal occlusion is likely when it is possible to infuse or flush through the CVC but it is not possible to aspirate blood. This is sometimes referred to as 'persistent withdrawal occlusion' (PWO). PWO can be due to malposition of the CVC and an x-ray may be necessary to confirm position. More likely is the formation of a fibrin sheath which occurs in the majority of CVCs in situ for more than 7 days.
- Attempts can be made to resolve PWO by first flushing the CVC, then (if appropriate) ask the patient to raise both arms above their head and/or take deep breaths/cough whilst an attempt is made to aspirate. Changing the position of the patient will sometimes work. Larger syringes can be used up to and including 50mL. If these measures are unsuccessful advice should be sough about the use of fibrinolytic drugs (egg Synerkinase).
- Intrauminal occlusion usually occurs because of clotted blood in the CVC but can also occur due to drug precipitation. Excessive force should not be used if resistance is felt during an attempt to flush a CVC. Advice should be sought about the use of fibrinolytic drugs (e.g. Synerkinase).
- **Thrombosis** can occur in a matter of days of CVC insertion and staff need to be aware of this possibility. Symptoms indicating possible CVC related thrombosis include pain in the shoulder or arm, swelling of one limb, distension of local venous system, skin discolouration. Medical attention/advice should be sought if thrombosis is suspected. Venograms are often performed to confirm the diagnosis and anticoagulant therapy is commenced. Oncology patients are often given Warfarin as prophylactic therapy for potential thrombosis because they are considered a 'high risk' group.
- Chemical phlebitis/extravastion is less likely in patients with a CVC than those receiving treatment peripherally but it should not be completely ruled out. Likely causes are catheter damage, fibrin sheath formation or malposition of the CVC.

Catheter Damage

- The risk of damage to CVCs can be minimised by avoiding:
    - The use of sharp instruments
    - Stretching or twisting the catheter
    - Excessive amounts of force when administering solutions
- Many CVCs with external damage can be repaired and specialist advice should be sought.
- If damage occurs to CVCs the catheter should be clamped on the patient side of the damage to prevent air embolism. Damaged catheters may need to be wrapped in sterile dressing (e.g. gauze) to reduce the risk of infection.

Catheter Migration

- It is possible for any CVC to become dislodged from its original position. Vigilance is required to ensure that any movement of the catheter is detected. This can be achieved by being aware of the catheter length at insertion (some CVCs are actually marked in centimetres for depth) and noting this at regular intervals. An ideal time is at dressing changes. The patient should also be educated to be aware of this problem.
- If catheter migration is noted or suspected, a repeat chest x-ray may be necessary to confirm satisfactory position.

People to contact for advice about Central Lines

Tunnelled CVCs, PICC

At Cheltenham General Hospital:

Practice Development Nurse (Oncology) Bleep 1052 or Extension 2831

Consultant Nurse for Oncology Bleep 1559, Extension 3881

Chemotherapy Clinical Nurse Specialist Extension 3264

Haematology Clinical Nurse Specialist Extension 4196/4325

Haematology Clinical Nurse Specialist Extension 4196/4325 GRH 5278

Gloucester Royal Hospital

Clinical Nurse Specialist Edward Jenner Unit Extension 5248

Apheresis Catheters (Haemo Dialysis Catheters)

Gloucester Royal Hospital

Clinical Nurse Manager for Renal Service County Wide Extension 6768

Access Sister Renal Ward/Cotswold Dialysis Centre Extension 6768

PORTS/Paediatric CVCs

Paediatric Respiratory Nurse, GRH. Extension 8475

Clinical Nurse Specialist, GRH. Extension 8484

Bristol Regional Centre – 0117 921 5411

5.0 CONSULTATION

5.1 PCT Infection Control and Prevention Team.
5.2 Specialist Nurse – Oncology Department GHNHSFT
5.3 Matrons (ops and development managers) Community Hospitals.
5.4 Ops and Development Managers - Community.
5.5 PCT Clinical Policy Group.
5.6 Clinical Effectiveness Committee (for information).

6.0 TARGET AUDIENCE

6.1 This policy is for use by staff employed by Gloucestershire PCT who undertake care relating to Central Venous Catheters.

7.0 COMMUNICATION OF THE POLICY

7.1 The Policy will be communicated to staff in paper format via line managers following the approved process.
7.2 The policy will be made available on the Trust Intranet and Website and it will also be highlighted in the staff newsletter.

8.0 TRAINING

8.1 Training is a process rather than an event. It consists of:
- Theoretical knowledge
- Practical training
- Supervised clinical practice
- Maintenance of up-to-date knowledge and skill
- Regular review at appraisal/Individual Performance and Development Review (IDPR).

8.2 Candidates must receive theoretical knowledge either through a formal study day or one to one/small group sessions with an expert practitioner. Theoretical training should be recorded on the competency document.
8.3 The candidate's manager may validate study and experience undertaken in previous employment at their discretion.
8.4 Those acting as assessors for supervised practice must hold an assessors qualification and must be certified as competent in the procedure themselves and undertaking the procedure regularly.
8.5 The assessor must be satisfied that the candidate has sufficient underpinning knowledge to carry out the procedure including viewing of Aseptic Non Touch Technique DVD as appropriate.
8.6 The assessor must make clear to the candidate that they are to be assessed and discuss with them the criteria against which they are to be assessed.
8.7 The assessments are recorded on the competency document relevant to the specific CVC.
8.8 The candidate must achieve all of the competency criteria for each type of CVC they are likely to encounter in their practice. Some practitioners will need to achieve all of the competencies (PICC, TCVC, AC, and Non-TCVC); others may need to achieve only one.
8.9 Some parts of the criteria may be assessed through simulation with a manikin (e.g. dealing with occlusion) but at least some of the assessment should take place in a 'live' situation.
8.10 Where the candidate is not successful in meeting all of the criteria for safe practice the supervisor should provide constructive feedback and plan re-assessment.
8.11 The candidate may request an alternative assessor is necessary. The assessor may ask an alternative assessor to take over if necessary.

9.0 COST IMPLICATIONS

9.1 As recommended by EPIC 2 Guidelines, 2% Chlorhexidine Gluconate in 70% Isopropyl Alcohol should be used for skin cleaning prior and post CVC insertion and for cleaning the needle free devices prior to accessing the line. This has a minimal

cost implication as the product is more expensive than Isopropyl Alcohol swabs previously used.

10.0 REFERENCES

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Alexander HR (1994) *Vascular Access in the Cancer Patient* J B Lippincott Company Philadelphia.
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Craft TM, Nolan J, Parr MJA (1999) *Key Topics in Critical Care* Bios Scientific Publishers, pp87 – 88
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Acknowledgements:
Gloucestershire Hospitals NHS Foundation Trust Central Venous Catheters Policy (2008)

Appendix 1

Gloucestershire Primary Care Trust

Clinical Policy Authorisation Form

NAME OF POLICY:	**Care and Management of Central Venous Catheters.**
AUTHOR:	Elizabeth Fenton – Assistant Director Nurse Leadership
DIRECTOR SPONSOR:	Jill Crook – Director of Clinical Development
NAME OF GROUP:	Clinical Policy Group

EQUALITY and DIVERSITY

An Equality & Diversity impact assessment has been completed	**Date completed: 25/1/2008**

CONSULTATION

NAME OF GROUP (S)	**DATE CONSIDERED & Recorded in minutes**
Clinical Policy Group	**October 2007**
Clinical Policy Group	**December 2007**
Infection Control	**December 2007**
Ops and Development Managers – Community and Hospital	**December 2007**
Clinical Development Nurse GHNHSFT	**December 2007 / April 2008**

EDUCATION & TRAINING:	**As detailed in section 8**
RESOURCE IMPLICATIONS:	**As detailed in section 9**

RATIFICATION

CLINICAL POLICY STEERING GROUP	**DATE APPROVED**
APPROVED	**July 2008**
REVIEW DATE:	**July 2010**

COMMUNICATION

HARD COPY ISSUED TO STAFF	**DATE: August 2008**
RECORDED ON CORPORATE SPREADSHEET	**DATE: August 2008**
POSTED ON INTRANET	**DATE: August 2008**

Appendix 2

Guidelines for the Administration of Drugs Via a CVC

Most drugs that can be administered intravenously peripherally can be administered via a CVC.

The following is guidance for the administration of drugs via a CVC:

1. Always check that a drug can be administered centrally (via a CVC). There may be a maximum rate or concentrate for administering a drug centrally. If the rate of administration of a drug is significant, always use a pump to accurately administer the drug at the correct rate.

2. If the CVC is a single lumen catheter, drugs must never be mixed unless there is evidence that they are compatible. If two drugs need to be given via the CVC and are not compatible, a "flush" must always be used (See section on flushing a CVC).

3. The exit outlet on a double and triple lumen catheter are staggered so that drugs will never come into direct contact with each other. It is therefore safe to administer drugs into each distinct lumen.

4. Blood Products – The Trust transfusion Policy states "Do not add any drugs to blood". This means that:
   - Drugs must <u>never</u> be added to a bag of blood.
   - A drug must never be administered into the same lumen as blood.
   - If blood is to be administered via a multi lumen CVC at the same time as another drug product, it is essential that if it is the FIRST dose of the drug product, that blood transfusion is withheld until this drug has been delivered. This is so that in the event of an adverse reaction occurring, there is no confusion as to which product is causing the problem. This procedure can be overridden if there is an urgent clinical need.

NB – In this context "drug" includes intravenous fluids of any kind.

Assessment of Competence for Registered Health Care Practitioners

Clinical Skill: Care of Peripherally Inserted Central Catheters

Name: ____________________ **Ward/Dept:** ____________________

Aim: To use and maintain Peripherally Inserted Central Catheters (PICC).

Objectives: The nurse will be able to:
Demonstrate understanding of the knowledge underpinning the procedure.
Demonstrate competency in performing the procedure.

Training: Attendance at a specific training session or skills station session and to complete the assessment of competence in the Care of Non-Tunnelled Central Lines and IV drug Administration.

Risk Assessment: High. (level of risk of harm to patient due to user error)

Assessment: Using performance criteria overleaf.
Those acting as trainers / assessors in clinical practice must hold an assessors qualification and must be certified as competent in the procedure themselves and be undertaking the procedure regularly.

Update: Competence to be reviewed annually at appraisal/Individual Performance Development Review (IPDR).

Underpinning Knowledge

- Demonstrates an understanding of infection control, aseptic technique and health and safety in relation to CVCs.
- Demonstrates an understanding of the different types of CVCs and the differences in their management.
- Demonstrates an understanding of how PICCs are inserted.
- Demonstrates knowledge of guidelines relating to PICCs
- Demonstrates an understanding of the signs and symptoms that could occur in the event of complications.
- Demonstrates an understanding of the necessary course of action in the event of complications occurring.
- Demonstrates the theoretical knowledge for safe administration of drugs/IV fluid via PICC.
- Offer self-care advice to patients/carers.

I certify that the above-named Registered Health Care Practitioner has completed the theoretical assessment which covered the above:

Signed:		**Date:**	
Print Name:		**Position:**	

Clinical Skill	
Performance Criteria: The practitioner will:	**Performed Safely (✓)**
1. Assesses a patient with a PICC for possible complications.	
2. Change dressing on patient using aseptic technique.	
3. Demonstrate flushing technique.	
4. Administration of drugs via a PICC.	
5. Discontinue an infusion.	
6. Take blood samples from a PICC.	
7. Demonstrate knowledge of dealing with the following problems • 'Withdrawal Occlusion' • Occlusion • Catheter damage • Catheter migration	
8. Demonstrate correct documentation of the procedure in the care plan.	

I confirm that the Registered Healthcare Practitioner named overleaf has completed the assessment competently.

Signed:		**Date:**	
Print Name:		**Position:**	

Assessor Comments:

Candidate Comments:

Declaration
I confirm that I have had theoretical and practical instruction on how to safely and competently perform and agree to comply with the policy and procedures of the Trust. I acknowledge that it is my responsibility to maintain and update my knowledge and skills relating to this competency.

Signed: .... **Grade:** ....

References:
Abrams P (1997) Urodynamics 2nd Edition Spring-Verlag, London
Mallet J & Dougherty L – The Royal Marsden Manual of Clinical Nursing Procedures (6th Edition) London
Harper & Row (1996) Lectromed Urodynamic Investigations System 6700 User Manual

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Appendix 3.2

Assessment of Competence for Registered Health Care Practitioners

Clinical Skill: Care of Tunnelled Central Venous Catheters

Name: .... **Ward/Dept:** ....

Aim: To use and maintain Tunnelled Central Venous Catheters (TCVC).

Objectives: The practitioner will be able to:

Demonstrate understanding of the knowledge underpinning the procedure.
Demonstrate competency in performing the procedure.

Training: Attendance at a specific training session or skills station session and to complete the assessment of competence in the Care of Non-Tunnelled Central Lines and IV Drug administration.

Risk Assessment: High. (level of risk of harm to patient due to user error)

Assessment: Using performance criteria overleaf.
Those acting as trainers / assessors in clinical practice must hold an assessors qualification and must be certified as competent in the procedure themselves and be undertaking the procedure regularly.

Update: Competence to be reviewed annually at appraisal/Individual Performance Development Review (IPDR).

Underpinning Knowledge

- Demonstrate an understanding of infection control, aseptic technique and health and safety recommendations in relation to CVCs
- Demonstrate an understanding of the different types of CVCs and the differences in their management.
- Demonstrate an understanding of how TCVCs are inserted.
- Demonstrate knowledge of guidelines relating to TCVCs
- Demonstrate awareness of the signs and symptoms that could occur in the event of complications.
- Demonstrate an understanding of the necessary course of action in the event of complications occurring, referring on where appropriate.
- Demonstrate safe administration of drugs/IV fluids via TCVC.
- Offer self-care advice to patients/carers.

I certify that the above-named Registered Health Care Practitioner has completed the theoretical assessment which covered the above:

Signed:		**Date:**	
Print Name:		**Position:**	

Clinical Skill	
Performance Criteria: The practitioner will:	**Performed Safely (✓)**
1. Assesses a patient with a TCVC for possible complications.	
2. Change dressing using an aseptic technique.	
3. Demonstrate flushing technique.	
4. Administration of drugs / fluids via a TCVC.	
5. Discontinue an infusion.	
6. Take blood samples from a TCVC.	
7. Demonstrate knowledge of dealing with the following problems • 'Withdrawal occlusion' • Occlusion • Catheter damage • Catheter migration	
8. Demonstrate correct documentation of the procedure in the care plan.	

I confirm that the Registered Healthcare Practitioner named overleaf has completed the assessment competently.

Signed:		**Date:**	
Print Name:		**Position:**	

Assessor Comments:

Candidate Comments:

Declaration
I confirm that I have had theoretical and practical instruction on how to safely and competently perform and agree to comply with the policy and procedures of the Trust. I acknowledge that it is my responsibility to maintain and update my knowledge and skills relating to this competency.

Signed: .... **Grade:** ....

References:
Abrams P (1997) Urodynamics 2nd Edition Spring-Verlag, London
Mallet J & Dougherty L – The Royal Marsden Manual of Clinical Nursing Procedures (6th Edition) London
Harper & Row (1996) Lectromed Urodynamic Investigations System 6700 User Manual

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Appendix 3.3

Assessment of Competence for Registered Health Care Practitioners

Clinical Skill: Care of Apheresis / Haemodialysis Catheters (AC)

Name: ______________________ **Ward/Dept:** ______________________

Aim: To use and maintain Apheresis / Haemodialysis Catheters (AC).

Objectives: The practitioner will be able to:

Demonstrate understanding of the knowledge underpinning the procedure.
Demonstrate competency in performing the procedure.

Training: Attendance at a specific training session or skills station session and to complete the assessment of competence in the care of Non-Tunnelled Central Lines and IV Drug Administration.

Risk Assessment: High. (level of risk of harm to patient due to user error)

Assessment: Using performance criteria overleaf.
Those acting as trainers / assessors in clinical practice must hold an assessors qualification and must be certified as competent in the procedure themselves and be undertaking the procedure regularly.

Update: Competence to be reviewed annually at appraisal/Individual Performance Development Review (IPDR).

Underpinning Knowledge

- Demonstrate an understanding of infection control, aseptic technique and health and safety in relation to CVCs
- The different types of CVCs and the differences in their management
- How ACs are inserted
- The guidelines relating to ACs
- The signs and symptoms that could occur in the event of complications
- The necessary course of action in the event of such complications occurring, referring on where appropriate
- Theoretical knowledge for safe administration of drugs/IV fluids via AC
- Offering self-care advice to patients/carers.

I certify that the above-named Registered Health Care Practitioner has completed the theoretical assessment which covered the above:

Signed:		**Date:**	
Print Name:		**Position:**	

Clinical Skill	
Performance Criteria: The practitioner will:	**Performed Safely (✓)**
1. Assesses a patient with an AC for possible complications.	
2. Change dressing using an aseptic technique.	
3. Demonstrate flushing technique.	
4. Demonstrate administration of drugs via an AC.	
5. Discontinue an infusion.	
6. Take blood samples from an AC.	
7. Removal of an AC	
8. Demonstrate knowledge of dealing with the following problems • 'Withdrawal occlusion' • Occlusion • Catheter damage • Catheter migration	
9. Demonstrate correct documentation of the procedure in the care plan.	

I confirm that the Registered Healthcare Practitioner named overleaf has completed the assessment competently.

Signed:		**Date:**	
Print Name:		**Position:**	

Assessor Comments:

Candidate Comments:

Declaration
I confirm that I have had theoretical and practical instruction on how to safely and competently perform and agree to comply with the policy and procedures of the Trust. I acknowledge that it is my responsibility to maintain and update my knowledge and skills relating to this competency.

Signed: ________ **Grade:** ________

References:
Abrams P (1997) Urodynamics 2nd Edition Spring-Verlag, London
Mallet J & Dougherty L The Royal Marsden Manual of Clinical Nursing Procedures (6th Edition) London
Harper & Row (1996) Lectromed Urodynamic Investigations System 6700 User Manual

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