GUIDELINES FOR THE MANAGEMENT OF CENTRAL VENOUS CATHETERS IN ADULTS

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1. Introduction

1.1 Central venous catheters (CVCs) or central venous access devices (CVAD) or central lines are tunnelled catheters intended for long-term access, inserted into the superior or inferior vena cava or right atrium or a large vein leading to these vessels. For purposes of this guideline the terminology Central venous catheters (CVCs) will be used only throughout.

1.2 Patients with cancer and other illnesses may require intravenous / cytotoxic therapy over a long period. Insertion of a central venous line will enable them to receive treatments such as chemotherapy, total parental nutrition, blood products, fluids, medications and blood sampling without the need for multiple venepunctures.

1.3 Catheters are inserted in hospital and many patients and carers are taught to be self caring prior to discharge. The community nurse may be involved in providing ongoing care for some of these patients with a catheter when they are discharged into the community.

1.4 CVCs disrupt the integrity of the skin, making infection with bacteria or fungi possible. Infection may spread to the bloodstream and hemodynamic changes and organ dysfunction (severe sepsis) may ensue, possibly leading to death.

2. Rationale of the Guideline

2.1 To ensure that practice across BACHS is safe and is based on current best practice guidelines by focusing on:
• preventing infection to reduce the incidence of catheter related bloodstream infection (CRBSI)
• management of the potential complications of CVCs
• maintaining catheter patency and preventing any damage to the device and in essence improving the quality of life of the patient.

2.2 To standardise the management of CVCs across BACHS and to ensure that staff caring for the patient with central venous catheters have access to guidelines and procedures to prevent complications occurring.

3. Key related documents

These documents should be read in conjunction with this guideline:

• BACHS Consent to Examination & Treatment (2010)
• BACHS Standard infection control precaution (2010)
• BACHS Infection control Isolation policy (2010)
• BACHS clinical waste management policy (2009)
• BACHS Hand Hygiene policy & procedure (2010)
• BACHS Decontamination policy
• BACHS Infection prevention management policy (2010)
• BACHS Management of contamination injury (Needlesticks/sharps) (2009)
• NHS BA Latex Policy (2007)
• NHS BA Medicines Management policy (2009)
4. Scope of the Guideline

4.1 These guidelines are applicable to all staff involved in the care of adult patients with a Peripheral Inserted Central Catheter (PICCs), Hickman Line (skin tunnelled catheter), apheresis catheter or a Port—a-Cath (see Appendix 1&2 for background information as well as illustrations and description of the types of catheter).

4.2 For children, see Central line policy and procedure- Children's community team

4.3 This document does not include guidance on CVC removal, its insertion, complications of insertion, parenteral feeding and intravenous therapy which is addressed separately within Leeds Teaching NHS Hospital Trust, Bradford NHS Teaching Hospital Foundation Trust and Airedale NHS Hospital Foundation Trust.

4.4 Bradford and Airedale community Health Services (BACHS) will only be concerned with the ongoing care of patients with a Central line. Management of their care and the central line will be exclusively facilitated as prescribed by their care plan from their secondary care provider.

5. Responsibilities and accountabilities

5.1 Service managers for staff involved in caring for patients with central line catheters are responsible for ensuring all relevant staff have access to this guideline and any equipment required for the care and maintenance of the CVC.

5.2 Service Managers and the Clinical Lead for Professions and Quality have a responsibility to ensure access to appropriate training and updates is facilitated for all relevant staff groups.

5.3 Heads of Service, the Clinical Lead for Professions and Quality and the Clinical Lead for Palliative Care will ensure staff are made aware of any policy changes and the need for new skills updates and training as relevant.

5.4 Staff involved in the care of patients with a CVC must have attained an acceptable standard of competency.

5.5 Staff have a responsibility to identify any areas for skills update or training requirements as detailed in the guidance notes for maintaining competency.

5.6 Staff must forward details of all CVC patients in their care to the Infection prevention control lead to record and collate and provide updates of care.

5.7 The Clinical Lead for Professions and Quality and the Clinical Lead for Palliative Care are responsible for facilitating the review and update of this guideline.
6. Infection Prevention and Control and CVC related bloodstream infections (CVCR-BSIs)

6.1 Infection prevention control and maintenance of CVC patency are of paramount importance in order to preserve the line for as long as possible. As well as reduce the risk for the patient developing any avoidable complications.

6.2 CVCs require a care regime to maintain optimum functionality and prevent patient complications. Some complications (e.g. sepsis, thrombosis) may be life threatening and it is important practitioners involved in the care of these devices are able to identify these and take appropriate interventional steps.

6.3 Bloodstream infections associated with central venous catheter insertion are a major cause of morbidity, mortality and increased costs of care.

6.4 A prevalence survey found that 42.3% of bloodstream infections in England alone are central line related (Smyth, 2006).

6.5 The ‘Saving lives high impact intervention’ recommends the use of the CVC bundle approach- a scientifically grounded approach that focuses on elements of the care process to improve patient outcomes by reducing the rate of CVCR-BSIs (DOH, 2007).

6.6 The CVC bundle consists of five components but just three aspects are relevant to the community setting:

- hand hygiene,
- use of chlorhexidine at each dressing change and access to the insertion/exit site (2% chlorhexidine gluconate in 70% isopropyl alcohol)
- At least a weekly review and monitoring of the central line

These interventions will be further discussed in the ‘Principles of Care of the Central Venous Catheter’ section.

6.7 The Health Act 2006 Code of Practice for Prevention and Control of Healthcare Associated Infections (HCAI) requires that all NHS organisations embed robust, standardised evidence based guidelines to ensure the effective prevention and control of Healthcare Associated Infections into everyday practice and applied consistently by all practitioners.

6.8 BACHS infection control policies takes into account these principles which must be applied to the care of all patients undergoing healthcare in the community. It includes all activities where there is a risk of contact with blood, body fluids, excretions and secretions which could potentially be infectious.

6.9 These principles are the basic minimum standard of hygiene which must be applied when in contact with blood or any other body fluids. It is a means of reducing the risk of the spread of infection to others and a means of protecting patients, staff and visitors.

6.10 Please refer to all BACHS infection control and prevention policies and procedures including guidance around clinical waste management & disposal whilst using this guideline.
7. Principles of Care of the Central Venous Catheter

7.1 General principles

7.1.1 General asepsis technique

7.1.1.1 An aseptic non-touch technique (ANTT) must always be used for catheter site care and for accessing the system to reduce the risk of infection associated with CVC care and maintenance. A strong correlation exists between bacteraemia and the presence of a CVC.

7.1.1.2 Please ensure that all equipment used for catheter site care are sterile or sterilised. (Refer to the Aseptic technique policy for further information).

7.1.1.3 Effective hand hygiene is required before and after accessing or dressing a CVC. Following hand antisepsis, sterile latex free gloves should be used when changing the insertion site dressing or line manipulation (EPIC 2, 2007).

7.1.1.4 Please note that the use of gloves does not eliminate the need for hand hygiene.

7.1.1.5 It is best practice to use non-latex gloves for procedures involving exposure to chemotherapy where there is no risk of contact with blood or body fluids.

7.1.1.6 Where there is the risk of contamination by blood and bodily fluids a disposable plastic apron should be worn to prevent contamination of clothing (RCN, 2005; EPIC2, 2007).

7.1.1.7 Please ensure that appropriate sharp boxes i.e. the purple tops should be used for sharps disposal.

7.1.1.8 Refer to relevant BACHS infection control policies for further detail on aseptic techniques mentioned.

7.1.2 Accessing the line

7.1.2.1 When accessing catheters, this should be undertaken in a way which reduces the risk of contamination with microorganisms. EPIC2 (2007) suggest that the use of needleless connectors (or needle-free access devices) on the ends of CVCs reduces the contamination rate of these catheters compared with a standard cap. This will minimise interruptions to the closed system.

7.1.2.2 Key points to be aware of:

- Do not allow air to enter the catheter- use a needleless connector to ensure a closed system
- All syringes and intravenous administration sets must be carefully primed (by clamping the lumen) to prevent air embolism. The negative pressure within the chest may suck air into the catheter during inspiration especially if the patient is sitting up.
- Health care personnel should ensure that all components of the system are compatible and
secured, to minimise the risks of leaks and breaks in the system.

- Only 10 ml (or larger) size syringes should be used when administering or removing fluid/blood from a line. NB: The pressure created as a liquid is injected into a CVC is dependent upon the size of the syringe. This pressure is measured in pounds per square inch (PSI).
- For all CVCs, recommended maximum pressure should be no greater than 40 PSI. This will be achieved by undertaking the ‘push pulse’ flushing technique to maintain patency of the CVC (HYCCN, 2009). Refer to Appendix 3 for the push pulse flushing technique.

7.1.2.3 It is recommended that the following process is used for changing the needleless components:

- Bionectors should be replaced weekly
- Please refer to the manufacturers’ guidance for the appropriate replacement protocol if this information is not provided. (Medical Devices Alert 2005; Health and social care Act 2008).

7.1.2.4 For Community Hospital patients with long-term vascular access devices the bungs should be changed on a set day (Sunday) to ensure continuity within and between units. The risk of contamination increases with every interruption to the closed system.

7.1.2.5 Whenever the bung/access device is removed from the catheter then it must be replaced with a new, needleless access device/bung.

7.1.2.6 If the catheter possesses an integral clamp, keep it closed whenever the cap is removed and at all other times except when administering or withdrawing fluids. Clamping should always take place at the designated area and never at the thickened area near the hub (except Hickmans).

7.1.2.7 The clamp will prevent air entry and bleeding should the luer lock cap become unattached. Repeated clamping away from the specially reinforced area may result in damage to the catheter.

7.1.3 Signs of infection

7.1.3.1 Any sign of systemic or local infection should always be taken seriously and refer to the responsible secondary care provider.

7.1.3.2 Local infections often present as exit site erythema and swelling. Standard treatment includes patient observations (BP, temp, pulse, respirations), and refer back to the discharging ward or hospital unit.

7.1.3.3 Systemic infections often present with patients reporting pyrexia, feeling unwell or rigors particularly associated with catheter flushes. Where a patient presents with a suspected catheter related systemic infection it is imperative they are admitted for a medical assessment immediately.

7.1.3.4 Investigation of systemic infections includes the need to obtain blood cultures peripherally and from the suspected catheter. Treatment of these infections involves admission to hospital and intravenous antibiotics.

NB: It is imperative that the care of patients exhibiting symptoms of systemic catheter
related infection is prompt as this complication can be life threatening.

7.1.3.5 All staff should use the central line inspection of phlebitis score (CLIPS) tool anytime they provide care/ treatment to the patient via the CVC device and access the insertion/exit site (refer to appendix 3 for the template).

7.1.4 Catheter Fracture

7.1.4.1 Catheters may fracture although these are rare events. The primary focus when this occurs must be to ensure the safety of the patient, through minimising the risk of air embolism and chemotherapy spillage.

7.1.4.2 Where there is a catheter fracture or it is accidentally cut, clamp it without delay proximal to the break. Catheters without clamps, such as PICCs should be folded back on themselves above the fractured area and secured. Send back to referring hospital ward as applicable.

7.1.4.3 A catheter with a fracture that is awaiting a medical decision or repair must be labelled to alert nurses that it must not be used. Specialist advice should be sought or referral, as appropriate, immediately back to the patients secondary care provider to consider removal or repair of the catheter to prevent haemorrhage, air embolism and infection.

7.1.4.4 The fractured area of a catheter should be covered by applying a transparent dressing.

7.1.5 Catheter securement

7.1.5.1 Securement techniques or anchoring devices have proved to be successful in the reduction of the incidence of central venous catheter related bloodstream infections (CVCRBSIs) and reducing the risk of accidental needle stick injuries. Securement techniques may also include the use of securement devices, sutures or, dressings.

7.1.5.2 In the community, patients may be discharged from hospital with a Statlock as catheters may require additional securement to prevent the risk of migration. This will also maintain patient’s comfort, to prevent tension or accidental dislodgement, and to reduce ‘to and fro’ motion which increases the risk of catheter related sepsis.

7.1.5.3 In all such cases, the receiving staff should consult with the discharging hospital to ascertain any specific care requirements as well as ordering replacements.

7.1.5.4 Statlocks are the securement method of choice for PICC catheters and Skin Tunnelled Catheters for the first three weeks whilst the anchor wing is in situ. Its placement should be in accordance with the manufacturer’s guidelines.

7.1.5.5 A strict aseptic technique must be maintained at all times whilst accessing the device.

7.1.5.6 Statlock devices should be replaced every seven days, if their integrity is compromised or where they are contaminated (e.g. with blood). Staff involved in the care of patients with a CVC will be required to order statlock devices as agreed with the referring secondary care provider.
7.2 Accessing the Catheter

Micro organisms that colonise catheter hubs and the skin surrounding the CVC insertion site are the cause of most catheter related blood stream infections. Skin cleansing and antisepsis of the insertion site is therefore one of the most important measures for preventing catheter related infections (EPIC2, 2007).

7.2.1 Skin disinfection

7.2.1.1 Staff should ensure that the CVC site care solution is compatible with catheter materials (tubing, hubs, injection ports, luer connectors and extensions) and carefully check compatibility with the manufacturer’s recommendations (RCN, 2005; YCN, 2007; EPIC2, 2007).

7.2.1.2 A solution of 2% chlorhexidine gluconate in 70% alcohol is the recommended choice of solution for the disinfection of catheter hubs.

7.2.1.3 An aqueous solution of chlorhexidine gluconate should be used if use of alcohol is not suitable for patients (EPIC, 2007). Chlorhexidine may not be suitable for all patients, please refer all queries regarding patient requirements (eg alternative antiseptic solutions, patient allergies, religious/ belief implications on care etc) to the secondary care provider in the first instance.

7.2.2 CVC patency

7.2.2.1 The patency and correct functioning of the catheter should be established before it is used for administering therapeutic drugs or fluids.

7.2.2.2 Failure to regularly maintain the patency of a CVC may result in delays in treatment, cost implications as well as preventable catheter complications that may arise leading to the discomfort of the patient.

7.2.2.3 Signs of catheter occlusion, whether partial or complete, should be taken seriously and action should be taken earlier rather than later to restore full patency. Ignoring the early signs may lead to the development of more serious problems which cannot then be easily rectified – eg complete blockage or thrombosis. Please refer to the section 8, Preventing and managing CVC complications.

7.2.2.4 Staff using CVCs can be confident of access if all three of the following apply:

- The catheter can be flushed with ease.
- Blood can be withdrawn from the catheter.
- The patient experiences no discomfort during flushing and there are no other complications.

7.2.2.5 How to assess for the above three criteria- some points to note:

- A proper assessment of the catheter involves observing the exit site and the area around as this may reveal any signs of thrombosis, leakage, infection etc. While this is not necessarily appropriate every time the catheter is used it should be a regular part of your practice.

- Checking for flashback of blood does not necessarily mean you have to discard blood. For example, attach a syringe containing 10ml 0.9% sodium chloride to the catheter, flush a couple
of ml into the line and then withdraw. As soon as you see a trace of blood in the catheter or syringe just flush the rest of the sodium chloride into the line briskly using the push-pause technique routinely when flushing the catheter - i.e. flush briskly, pausing briefly after approximately each ml of fluid. The ‘push-pause’ technique causes turbulence within the catheter, which helps to flush away any debris and prevent occlusion of the lumen.

7.2.2.6 It is essential that active measures are taken to maintain the patency of the catheter. This is normally achieved by the regular administration of a heparin flush solution, however the National Patient Safety Agency (2008) recommend that the use of heparin flushes in all devices, including complex central venous or arterial catheters is minimised.

7.2.2.7 In light of this recommendation heparin flush solutions must only be used in accordance with

a) written guidance from the secondary or tertiary care organisation which has overall responsibility for the patient where and

b) a formal prescription or patient group direction.

7.2.2.8 As with all medicines, care must be taken to ensure the correct product is selected and the correct dose administered.

7.2.3 Flushing of CVCs

Flushing is recommended to promote and maintain patency and prevent the mixing of incompatible medications and solutions

On discharge from secondary care, as an acceptance criteria for admission into community care, all patients will be expected to have their individual care plan and protocol of care with the following guidance within:

• Frequency, procedure and type of flush solution to be used for their CVC device

• details of the treatment and general care of the patient

7.2.3.1 Flushing After and Between Uses - Flushing Technique

Do not use syringes smaller than 10 ml for infusion into the catheter. Smaller syringes exert greater pressure. The larger size will prevent excessive pressure being exerted on the lumen which might cause it to rupture. NB: Syringe size alone is not sufficient to prevent rupture. Regardless of the syringe size, if any resistance is felt and more pressure is applied to overcome it, this may result in catheter fracture.

Use a brisk ‘push-pause’ flushing technique routinely when flushing the catheter. Refer to appendix 3 for more details. NB: It is necessary to create a positive pressure when flushing the tubing to prevent backflow of blood into catheter. This is accomplished by clamping the tubing while flushing. If using a positive displacement cap, do not clamp tubing until after removal of syringes (RCN 2005; RCN 2007).

If the catheter possesses a clamp, clamp the line while the final ml of the flush is being injected. If there is no clamp you can achieve a “positive pressure finish” by removing the syringe from the Statlock while injecting the last ml: but note that to avoid any spray from the syringe you should hold sterile gauze around the connector while doing this. Maintaining
positive pressure helps prevent blood entering the catheter after flushing, which might lead to occlusion or thrombus formation.

7.2.4 Dressing and Care of the Site

The following must be considered before dressing changes as well as general care of the insertion / exit site:

S - Sterility
S - Stability
I - Inspection (Allows for continuous visual inspection of the catheter and insertion site)
V - Versatility (Ability for the patient to shower and bathe without the dressing becoming saturated)
D - Duration (Limited dressing changes)

7.2.4.1 The safe maintenance of a central venous catheter and relevant care of the catheter site are essential components of a strategy for preventing catheter related (CR) infections in patients. This includes good practice in all aspects of catheter care, and the use of an appropriate catheter site dressing regimens.

7.2.4.2 The type of dressing selected should be based upon minimising the risk of infection and optimising patient comfort. Based on the essential criteria (SSIVD) mentioned above transparent dressings are the dressings of choice.

7.2.4.3 Where established skin tunnelled CVC insertion sites are dressed because of an infection, the insertion site must be cleaned with 2% chlorhexidine gluconate in 70% isopropyl alcohol individual wipes and allowed to air dry prior to application of a new dressing.

7.2.4.4 Cleaning should be carried out using an aseptic technique.

7.2.4.5 During dressing changes a 2% chlorhexidine gluconate in 70% isopropyl alcohol should be used to clean the catheter site using an outward 'single-swipe' motion to avoid transferring bacteria to the exit site, and then allowed to air dry. Check manufacturer's recommendations on the use of alcohol based substances and also the patients care plan for any implications on their care.

7.2.4.6 Transparent dressings should be replaced every seven days except where there is an indication that they need changing sooner or the integrity of the dressing is compromised e.g. blood leakage, infection or after flushing the line.

7.2.4.7 Where a skin tunnelled catheter is in situ including skin tunnelled apheresis lines, the catheter insertion site may be left without a dressing once the insertion is healing provided:

- There are no signs of infection- query is it red, hot and inflamed?
- The catheter is well anchored to avoid possibility of migration or skin abrasions
- The patient is in agreement with this practice

7.2.4.8 Where catheter insertion/exit sites shows evidence of infection, regular dressings should be performed until the problem resolves. This should be reviewed regularly subject to an improvement in the appearance and state of the infected site.
Each time the dressing is changed the exit site should be assessed for any signs of infection using the CLIPS tool (refer to appendix 3) and documented in the patient’s care plan/notes.

7.2.4.9 If site is red or discharging, then check the patient’s temperature. If concerned inform the patient’s GP or refer back to the discharging ward or hospital unit as applicable.

7.2.4.10 Established skin tunnelled CVC insertion sites which are a minimum of 3 weeks post insertion or displaying no signs of infection do not require routine maintenance with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution/individually wipes. These sites may be left undressed and cleaned with running water e.g. shower (NPSA, 2008).

7.2.4.11 If a patient demonstrates an allergy to the semi-permeable transparent dressing then contact the referring hospital ward for information on any other preferable alternatives.

7.2.4.12 If sutures are in situ upon the patient’s discharge from hospital, advice should be sought from relevant patient’s secondary care provider regarding removal of these.

7.2.4.13 The patient may take advice to run clear water over site at the end of showering, but it is not advised to immerse the catheter in bath water or to swim.

Table 1: Summary of dressing and CVC site care

<table>
<thead>
<tr>
<th>Dressing / site status</th>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
</table>
| Catheter insertion site without dressing: | Why? Check and confirm the following:  
  - There are no signs of infection  
  - The catheter is well anchored to avoid possibility of migration or skin abrasions  
  - The patient is in agreement with this practice | The site may be left without a dressing once the insertion is healing provided |

Exit site dressings within the first two days of insertion:  
- If this leads to “strike-through” on a dry dressing, (i.e. exudates / blood/serous fluid observed on the outside of a dry dressing) it should be changed immediately using an aseptic technique as a wet surface provides “a liquid pathway for bacteria to travel” to the wound  
- A dry dressing should be covered and sealed with a transparent dressing  
- If there is excessive bleeding and the gauze/dressing becomes soggy it should be changed. In most cases this will absorb any oozing but not necessitate changing the dressing.  
- If bleeding is excessive the dressing should be changed every time strike-through occurs and replaced with a more absorbent or  
- Routine taking down of the dressing post-insertion to inspect the site merely exposes the patient to increased risk of infection.  
- On the other hand most exit sites bleed to some extent following insertion.  
- It is not acceptable to add more dressings on top of blood-soaked dressings which have been in contact

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<table>
<thead>
<tr>
<th>Dressing / site status</th>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>thicker dressing. Pressure should then be applied to the site and the patient encouraged to lie fairly still until the bleeding settles. Refer back to Hospital</td>
<td>with a moist outer surface, because of the infection risk.</td>
<td></td>
</tr>
</tbody>
</table>

**On-going dressing regimes after the first 1-2 days:**

- Where a dressing is used it should be inspected regularly and renewed immediately should it become soiled, wet or detached
- If the exit site is reddened, painful, exudating or infected, increase the frequency of dressing change depending on the amount of exudates. Refer back to hospital

**A moist environment is one in which bacteria readily multiply**

**Sign of infection:**

- Regular dressings should be performed until the problem resolves. This should be reviewed regularly subject to an improvement in the appearance and state of the infected site.

**Signs:** If site is red or discharging, then check the patient’s temperature. If staff is concerned inform the patient/s GP or refer back to the discharging ward or hospital unit as applicable.

**Exit site minimum of 3 weeks / 21 days post insertion showing no sign of infection:**

If not displaying any signs of infection does not require routine maintenance with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution/individual wipes/dressing. These sites may be left undressed and cleaned with running water

8. Prevention and Management of CVC complications

Refer to Appendix 7 to access the quick reference guide tool for managing problems with CVCs (HYYCN, 2009).

8.1 Catheter-related infection

8.1.1 Catheters may become infected, resulting in local or systemic infections. Catheter-related bloodstream infections can be severe and life-threatening depending on the micro-organism involved such as MRSA Bacteraemia.

8.1.2 Local infections often present as exit site erythema and swelling. Standard treatment includes patient observations (BP, temp, pulse, respirations), and refer back to the hospital discharging ward or GP.
8.1.3 A tunnel infection is characterized by pain and induration along the track of the catheter.

8.1.4 Systemic infections often present with patients reporting pyrexia, feeling unwell or rigors particularly associated with catheter flushes.

8.1.5 Where a patient presents with a suspected catheter related systemic infection it is imperative they are admitted for a medical assessment immediately. Investigation of systemic infections includes the need to obtain blood cultures peripherally and from the suspected catheter and to undertake regular patient observations (BP, temp, pulse, respirations). Treatment of these infections involves admission to hospital and intravenous antibiotics.

**NB: It is imperative that the care of patients exhibiting symptoms of systemic catheter related infection is prompt as this complication can be life threatening.**

8.1.6 Particular care should be taken to ensure patients are aware of the potential for catheter related infections and are aware they should contact the hospital immediately if they experience any worrying symptoms.

8.1.7 All staff should use the central line inspection of phlebitis score (CLIPS) tool anytime they access the insertion/exit site (refer to appendix 3 for the template).

8.2 Catheter blockage

8.2.1 Partial and complete catheter blockage is evidenced by difficulty in aspirating blood or infusing fluid.

8.2.2 Forcible introduction of fluid down an obstructed lumen may cause catheter rupture. Catheter occlusion may include blockage due to kinking of the catheter, “pinch off syndrome”, occlusion of the catheter tip on the vessel wall, fibrin sheath or fibrin flap or luminal thrombus, or migration of the tip into a smaller vessel.

8.2.3 Pinch-off syndrome occurs when a skin-tunneled catheter is occluded by a patient’s clavicle and first rib, resulting in resistance or occlusion that is positional. It typically presents as an occluded catheter when a patient’s arm is in a resting position. However, when the arm is raised, catheter patency is restored.

8.2.4 If pinch-off syndrome is suspected, refer the patient to their secondary care provider as urgent.

8.3 Catheter-related thrombosis

8.3.1 Catheter-associated thrombosis may be spontaneous, or may result from a prothrombotic state. If suspected the patient must be referred on to their secondary care provider. The catheter will normally require removal if thrombosis is confirmed. Refer to appendix 5 for the quick guide matrix to managing CVC complications

8.3.2 Intraluminal thrombosis may be prevented by adhering to appropriate flushing protocols and ensuring good placement of the catheter tip.

8.3.3 If the patient has a PICC, any swelling of the arm should be monitored. Swelling alone does not
confirm thrombosis, and if suspected will be confirmed radiologically, by Doppler ultrasound CT scanning or other imaging. If confirmed, the PICC would be removed and anticoagulants commenced as described previously.

8.4 Catheter Phlebitis

8.4.1 Phlebitis is a complication associated only with PICCs which usually presents 3-7 days after insertion and is characterised by erythema above the insertion site which over time tracks along the length of the vein.

8.4.2 It may also include tenderness and swelling. In such cases, advise the patient to contact the discharging ward or hospital unit.

8.4.3 The central line inspection of phlebitis score (CLIPS) tool should be used as a systematic consistent approach to assessing and evidencing characteristics of the infection sites as seen by the practitioner involved.

8.5 Catheter migration and tip placement

8.5.1 Catheter migration is usually recognised when catheter length appears longer than expected. Where a PICC is inserted, the length of external catheter at insertion will be recorded in the patient notes and this can be used as a baseline upon which to assess migration.

8.5.2 In any event, where migration is suspected, individual cases must be referred on to the responsible secondary or tertiary care organisation who has responsibility to undertake remedial action.

9. Accepting a patient with a CVC into the community

9.1 Patients will be accepted into the community subject to provision of their individual care plan protocol which should include information/procedures for flushing their CVCs and other relevant procedures that BACHS community staff would be involved in whilst managing their care.

9.2 Other essential information would include contact details of the referring hospital ward and responsible Consultant as well as a process or pathway to manage any complications that may arise.

9.3 It is expected that prior to discharge from hospital, patients and their carers should:
   • receive both verbal and written education regarding the care of the CVC line.
   • Ensure the patient is able to care for the CVC when discharged or that their carer is able to assist with the maintenance of the device.
   • Educate patients in the importance of hand hygiene and refraining from unnecessary handling of the catheter entry site.

9.4 The role of the receiving Community Nursing team is to ensure that all of the above has happened and to reiterate education and advice.

9.5 Please refer to appendix 6 for further details on patient information
10. Staff training & Education

10.1 All staff groups involved in the care and management of patients with CVCs must access the appropriate training. They must have completed their mandatory infection prevention and control training and updates as required.

10.2 They should ensure they are competent in the skills to execute these procedures as relevant to their role and responsibilities.

10.3 The training package will be delivered by BARD but will be supported by the Palliative care team and also relevant service managers to be affected by this guideline.

10.4 It will be initially a full one day course followed by an annual competency update.

10.5 Practitioners managing CVCs must be able to demonstrate their competency and be able to:
- Discuss the issues of accountability and responsibility in relation to central line administration.
- Discuss specific safety issues associated with different routes of administration as well as care and prevention of catheter related bloodstream infection (CRBSI) and also managing a central venous catheter safely (NICE, 2003; DOH, 2006).
- Recognises and manages common complications associated with the CVC.
- Demonstrates an understanding of the information and educational requirements of patients prior to and post CVC insertion.
- Understand the physical and psychological impact a CVC has upon the patient and carer.

10.6 Practitioners should not engage in the care and management of CVCs unsupervised until they have achieved competence in this practice.

10.7 Competency will be assessed by appropriately skilled practitioners as identified within the service teams (CST, DNs and Community Matrons).

10.8 Aspects of CVC interventions which involve the practice of intravenous therapy must not be delegated to individuals who have not been assessed as competent in this role.

10.9 Staff will be required to complete all mandatory infection prevention control training as per training needs analysis and if not up to date will not be allowed to perform this procedure.

11. Monitoring and implementation

11.1 This guideline will be reviewed two years after its publication and approval against staff compliance with the requirement to minimise the use of heparin flushes as well as overall compliance with the central line bundles of preventive care.

11.2 This may be subject to any amendments or revisions made to enclosed procedures from ANHSFT and BNHSFT for flushing central lines of patients in our care settings made prior to this timescale.

11.3 The guideline will also be audited against key elements of infection prevention that would focus...
on achieving a reduction in the incidence of catheter related bloodstream infection (CRBSI). The Health Act 2006 Code of Practice states that NHS organisations must audit key policies and procedures for infection prevention.

11.4 Consequently an audit tool with appropriate criteria will be developed to monitor compliance against the central line bundle for ongoing care relevant to BACHS. There are five key components involved but only three are pertinent to the service we provide:

- hand hygiene,
- use of chlorhexidine at each dressing change (2% chlorhexidine gluconate in 70% isopropyl alcohol)
- At least a weekly review and monitoring of the central line

11.5 Compliance validation of these elements against the individual patient care process will highlight elements of their care that are or are not performed or undertaken.

12. Dissemination of the CVC guideline

All relevant staff will be made aware of this guidance through staff talk, within relevant team/service meetings and BACHS intranet.
13. References


Birmingham East & North NHS (2008) Policy for the care of patients with Central venous catheters (CVC)


Leeds Teaching Hospital Trust (2005) Guideline for the prevention of infection associated with central venous catheters


National Institute for Clinical Excellence (2003) Infection control, prevention of healthcare-associated infection in primary and community care. NICE Clinical guideline No. 2


North Trent Cancer network (2008) Central venous Access device policy


Royal College of Nursing (RCN) (2007) Standards for Infusion Therapy. London: Royal College of Nursing


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Appendix 1: Background information Illustrations of the types of CVCs available as well as positioning

(i) Definition of a Central Venous Catheter (CVC)

The term Central Venous Catheter (CVC) refers to an intravenous catheter whose internal tip lies in a large central vein. There are various different types of CVC but common to all is the idea that the tip of the catheter floats freely within the bloodstream in a large vein and parallel to the vein wall. Blood flow around the catheter is maximised, and physical and chemical damage to the internal walls of the vein are minimised.

Opinions vary about the ideal place for the tip of a CVC but it is generally accepted that for a catheter to be considered a “central catheter” the internal tip should be in one of the following positions.

a. Superior vena cava
b. Junction of the right atrium and the superior vena cava (also known as the atrio-caval junction)
c. Right atrium
d. Inferior vena cava above the diaphragm (femoral catheters)

Tip positions outside these areas are thought to be related to a significantly higher risk of complications, notably thrombosis. In practice, CVC tips are not static and their position varies depending on the patient’s position, arm movements etc.

(ii) Indications

- To monitor central venous pressure
- To administer large amounts of intravenous fluids (e.g. colloids, blood products etc.)
- To administer irritant, vesicant or hyper-osmolar drugs / fluids (for example Noradrenaline/Adrenaline, NaHCO3, Parenteral Nutrition, chemotherapy etc.)
- To provide long term access for frequent or prolonged use (e.g. chemotherapy, antibiotics,

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blood sampling, apheresis, continuous renal replacement therapy (CRRT), haemodialysis etc.).

**Guidelines for the insertion of central venous catheters are not covered in this guideline.**

**Figure 2: Hickman /Groshong line insertion illustrated** (Sansivero G. (1998))
Appendix 2: Types of Catheters and descriptions of each

Central Venous Catheters (CVCs) commonly found within the speciality include:
- Peripherally inserted central catheters (PICCs)
- Skin-tunnelled catheters (Hickman-type and Broviac lines).
- Groshong Line
- Alternative ports (includes apheresis catheters and ports (which are encountered less frequently), non tunnelled devices (subclavian, jugular/femoral lines) and implantable ports (port-a-caths) for children

**Peripherally Inserted Central Catheters (PICC Lines)**

**Figure 3: PICC Line** (North Trent Cancer network, 2008)

There are 2 types of PICC lines in common usage-
- *Bard Groshong PICC lines:*

**Figure 4: Example of a BARD PICC** (http://home.caregroup.org/centralLineTraining/)

A translucent silicone, thin walled, blunt tipped catheter. The line has a radiopaque stripe and depth markings and an attachable suture wing. There is an attachable suture wing for skin fixation. The line has a 3-position valve, which prevents the need for a clamp.
• Vygon PICC lines: A polyurethane, thin walled, open-ended catheter. The line is depth marked 60 cm catheter.

_Hickman Line (Skin Tunnelled Catheter)_

A silicone skin – tunnelled catheter intended for long term access, inserted into the superior or inferior vena cava or right atrium or a large vein leading to these vessels. These lines have clamps for use, when accessing the line to prevent air embolism and/or blood loss. Available in single, double and triple lumen, usually colour coded. The red or brown lumen is usually larger in size and is used for blood sampling.

**Figure 5: Example of a Hickman line** (North Trent Cancer network, 2008; Great Glasgow & Clyde NHS, 2008)

_Groshong Line_

A translucent or blue silicone, thin walled, blunt tipped, cuffed skin – tunnelled catheter. The line has a radiopaque stripe and an attachable suture wing. The line has a patented

**Figure 6: Example of a Groshong Line** ([http://home.caregroup.org/centralLineTraining/](http://home.caregroup.org/centralLineTraining/))
three-position valve, which prevents the need for a clamp. Available in colour coded single and double lumen. The red lumen is used for blood sampling. *Heparin solution is not required when flushing Groshong lines.*

**Alternative Ports**

If alternative devices are being used for example implantable venous access systems i.e. Port-A-Cath or Vascuports; the Community Nurse must liaise with the Acute Trust linked to the patient’s care or seek specialist advice from BACHS Children’s community team based at Horton park centre as these devices are more usually used in paediatric care.

**Figure 7: Example of an implantable port (North Trent Cancer network, 2008)**
Appendix 3: Procedure for flushing catheters

Please Refer To The Next Few Pages For The Following:

Airedale NHS Foundation Trust’s ‘Flushing’ and ‘Taking Blood Samples’ from a Central Line procedure

BACHS Central Line Inspection of Phlebitis Score Form (Clips)

Bradford Teaching Foundation Hospital Trust sample Central Line Inspection of Phlebitis Score Form (Clips)

BACHS Central line care plan management template

Procedure for using a push pulse technique to flush CVC devices

- Open ended catheter e.g. BARD, Hickman – flush with 5mls heparinised saline in a 10ml syringe. Clamp while injecting the last 0.5mls to maintain positive pressure in the catheter.
- Valved catheters e.g. BARD Groshong PICC – flush with 10mls sodium chloride 0.9%. These lines do not have a clamp and naturally maintain positive pressure.
- Positive pressure needle free device – use the flush appropriate for the line. On completion of flush remove the syringe and then clamp.
- Implanted Ports – flush with 10mls sodium chloride 0.9% and then 5mls heparinised saline. Clamp while injecting the last 0.5mls to maintain positive pressure in the catheter.
- Clean with 2% CHG (in 70% alcohol wipes) and ensure the line is secured.
- Dispose of equipment.
- Document administration.
- Evaluate care given and plan future care.

Procedure for cleaning catheter insertion site

Cleaning:
- Clean exit site at dressing changes using 2% CHG in 70% isopropyl solution using an outward "single-swipe" motion to avoid transferring bacteria to the exit site.

Dressings:
- Post-insertion: gauze under transparent dressing for 1-3 days.
- After 3 days: Transparent dressing recommended. Change every 7 days

Bathing & showering:
- The exit site must not be allowed to get wet.
### CENTRAL LINE INSPECTION OF PHLEBITIS SCORE (CLIPS) TOOL

<table>
<thead>
<tr>
<th>Patient Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital No/NHS Number:</td>
<td></td>
</tr>
<tr>
<td>Consultant:</td>
<td></td>
</tr>
<tr>
<td>Discharging Ward/Hospital:</td>
<td></td>
</tr>
<tr>
<td>D.O.B:</td>
<td></td>
</tr>
<tr>
<td>CVC Inserted By:</td>
<td></td>
</tr>
<tr>
<td>Insertion Site:</td>
<td></td>
</tr>
<tr>
<td>Type of Lumen:</td>
<td></td>
</tr>
<tr>
<td>Patient Infection History:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line Site Appears Healthy</th>
<th>CLIPS Score Total:</th>
<th>Decision Made:</th>
<th>Any Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No signs of phlebitis:</td>
<td>Observe Line:</td>
<td></td>
</tr>
<tr>
<td>Line Site Appears Healthy</td>
<td>One of the Following is Evident:</td>
<td>Possible First Signs of Phlebitis:</td>
<td>Observe Line:</td>
</tr>
<tr>
<td>1</td>
<td>Early Stages of Phlebitis:</td>
<td>Inform Medical Staff:</td>
<td>Refer to: Guidelines for the Management of Central Venous Catheters in Adults</td>
</tr>
</tbody>
</table>

Guidelines for the management of Central venous catheters in adults © BACHS 2010
Flushing a Central Venous Catheter – Guidance from Airedale Foundation NHS Trust

(EQUIPMENT)

1. 2 x new cap for the end of the catheter (double)
2. 3 x 10ml syringes for each lumen
3. Filter Needles x 2 one for each lumen
4. Green needles x 2 one for each lumen
5. Chlorhexidine 2% wipes or Chlorhexidine in alcohol solution
6. 2 x 10ml vial of normal saline 1 for each lumen
7. Heparin solution (either one 5ml vial hepsal or two 2ml vials Hepflush for each lumen)
8. A dressing pack
9. Alcohol-based hand-rub eg Manusept

Gather all equipment onto a clean surface

PROCEDURE TO FLUSH THE CATHETER

1. Thoroughly wash and carefully dry your hands
2. Open 1 dressing pack onto a cleaned surface
3. Open the remaining equipment onto the towel
4. Clean hands with hand-rub
5. Put on sterile gloves
6. Draw saline into a 10ml syringe one for each lumen using green needles
7. Draw up hepflush using filter needles
8. Place the dressing towel under the catheter
9. Clean the outside of the line, clamp and hub with gauze soaked with chlorhexidine or chlorhexidine wipes
10. Ensure the clamp on the catheter is closed and remove the cap
11. Clean the end of the catheter carefully with gauze with chlorhexidine on or the wipe and allow to dry
12. Attach the empty 10ml syringe onto the catheter, open the clamp on the catheter, withdraw back approx 2 – 3mls to remove the fluid in the catheter and re-clamp the catheter and remove the syringe from the catheter and discard
13. If you feel resistance as you inject into the catheter and the catheter begins to bulge, stop injecting re-cap the catheter and contact the hospital for advice
14. Attach the syringe containing the saline onto the catheter, open the clamp on the catheter, inject the solution slowly using a pulsating action, re-clamp the catheter and remove the syringe
15. Attach the syringe containing the heparin onto the catheter, open the clamp on the catheter, slowly inject the heparin into the catheter maintaining a positive pressure on the syringe as you close the clamp
16. Remove the syringe and attach the new cap to the end of the catheter
17. Dispose of the equipment safely
18. If the catheter has more than one lumen please treat them as completely separate lines and flush each one.

Please do not hesitate to contact the hospital if you have any problems or concerns.

CONTACT NUMBERS Haematology/Oncology Day Unit 01535 292934
Pat Dyminski CNS 01535 652511 (bleep 3115) Ward 3 01535 202031
TAKING BLOOD SAMPLES FROM A CENTRAL LINE

EQUIPMENT

1. "A dressing pack or 2 sterile dressing towels and gauze squares.
2. Chlorhexidine in alcohol solution or large spirit swabs
3. 1 5ml syringe, 1 10ml syringe, 1 10ml syringe and 1 syringe large enough to take the blood sample or Vacutainer system and Adapter
5. Cap for the catheter.
7. 10mls vial of normal saline
8. Heparin solution (either one 5ml vials Hepesal or two 2ml vials Hepflush)
10. Pathology blood sample request form.
11. Alcohol based hand rub e.g. Menusept.

PROCEDURE

1. Thoroughly wash and carefully dry hands
2. Open dressing pack or 1 dressing towel onto a clean surface.
3. Open remaining equipment onto the pack or towel.
4. Clean hands with the alcohol hand rub
5. Draw up heparin solution into a 5ml syringe. And normal saline into 10ml syringe
6. Clean hands with the hand rub
7. Place sterile dressing towel under the catheter
8. Put on sterile gloves.
9. Clean the outside of the catheter, clamp and hub with gauze with chlorhexidine solution or a large spirit swab
10. Ensure the clamp on the catheter is closed and remove the cap from the end of the catheter.
11. Clean the end of the catheter carefully either with g
   chlorhexidine solution or a large spirit swab and allow

12. Attach a 10ml syringe or Vacutainer system to the catheter unclamp the line withdraw 10mls of blood
   the catheter, remove the syringe or the blood bottle
   Vacutainer system and discard the blood.

If the catheter will not bleed, try moving the patient to move the tip of the catheter away from the vein.
Lift up the arm on the side of the catheter, stand the up, lie the patient down, ask the patient to cough
Central Catheters will not bleed

13. Attach the second syringe or blood bottle to the Vacutainer system and withdraw enough blood
    blood bottles required, or fill the required bottle
    Vacutainer system reclamp the catheter and rep
    syringe or Vacutainer system.

14. Attach saline syringe to the end of the catheter
    inject slowly, reclamp the catheter and remove syr

15. Attach heparin syringe to the end of the catheter
    slowly maintaining a positive pressure on the syring
    reclamp the catheter.

16. Remove the syringe, clean the end of the cathete
    required, and put the clean cap onto the end of the

17. Ensure the correct amount of blood is put in ex
    bottle and that the bottles are labelled correctly.

18. Dispose of equipment safely.

19. Place blood in the request bag and send to pathok

Please do not hesitate to contact the hospital if any problems or concerns. CONTACT NUMBERS

Haematology/Oncology Day Unit 01535 292934
June Toovey CNS 01535 652511 (bleep 3115)
WARD 3 01535 292031
# CENTRAL LINE INSPECTION OF PHLEBITIS SCORE (CLIPS)

**DAY CASE UNIT**

**Date of insertion:**

**Inserted by:**

**Insertion site:**

**Type of lumen:**

**Biopatch & Dressing dated:**

## Guidelines

<table>
<thead>
<tr>
<th>Line site appears healthy</th>
<th>DATE</th>
<th>CLIPS SCORE</th>
<th>DRESSING &amp; BIOPATCH CHANGED*</th>
<th>Comments/Action taken</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>* No Pain</td>
<td>Day</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One of the following is evident:</td>
<td>Day</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Slight pain at line site</td>
<td>Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Slight redness around line site</td>
<td>Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two or more of the following are evident:</td>
<td>Day</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Pain at line site</td>
<td>Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Erythema</td>
<td>Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Swelling</td>
<td>Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Pyrexia</td>
<td>Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Oozing</td>
<td>Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Pus</td>
<td>Day</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Early stages of phlebitis:**

- Inform medical staff.
- Refer to:
  - Protocol for the management of Suspected Sepsis Related to Central Venous Catheters.
  - OR
  - Protocol for the management of suspected parenteral nutrition (PN) Central venous Catheter related sepsis.

**Central Line Inspection of Phlebitis Score**

**Removal of Line:**

**Date removed:**

**Removed by:**

**Swab taken:**

**Yes**

**No**

**Tip sent for C&S:**

**Yes**

**No**

**Sterile dressing to site:**

**Yes**

**No**

* CHANGE AND DATE DRESSING & BIOPATCH EVERY 7 DAYS (OR AS CLINICALLY REQUIRED)  ICT Nov 2008
BACHS Central line management Care Plan

Medication – Central Line Management

<table>
<thead>
<tr>
<th>Instructions</th>
<th>Date, time &amp; signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undertake patient centred assessment, planning care jointly with the patient and carer in line with BACHS Central Line policy.</td>
<td></td>
</tr>
<tr>
<td>Ensure the preservation of privacy and dignity is central to assessment and treatment.</td>
<td></td>
</tr>
<tr>
<td>Ensure procedure is fully explained and understood by patient and obtaining consent in line with BACHS consent policy.</td>
<td></td>
</tr>
<tr>
<td>Ensure referral is accompanied by guidelines for managing the central line.</td>
<td></td>
</tr>
<tr>
<td>Ensure products used for flushing the line are prescribed appropriately.</td>
<td></td>
</tr>
<tr>
<td>Maintain health and safety by:</td>
<td></td>
</tr>
<tr>
<td>- All aspects of care to be undertaken in line with guidelines for managing the central line provided by the referring oncology unit.</td>
<td></td>
</tr>
<tr>
<td>- Dispose of waste in line with BACHS infection control and waste management policies.</td>
<td></td>
</tr>
<tr>
<td>- Dispose sharps in line with BACHS infection control policies.</td>
<td></td>
</tr>
<tr>
<td>Evaluate effectiveness of treatment at each visit, acknowledging patient satisfaction.</td>
<td></td>
</tr>
<tr>
<td>Provide appropriate lifestyle education.</td>
<td></td>
</tr>
<tr>
<td>Document intervention in line with NMC guidelines for records and record keeping BACHS standards for clinical records keeping.</td>
<td></td>
</tr>
</tbody>
</table>

Policies can be accessed at the following site:
http://nww.bradford.nhs.uk/extranet/Policies/Pages/default.aspx

Patient Specific instructions

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Appendix 4- Patient information

Patients/carers who have agreed to care for their line and would be flushing and/or dressing the line themselves should have additional guidance provided to support this as follows:

- Provision of a 24-hour contact number if they have any worries about their line.
- Information regarding activities and possible restrictions that are applicable with day to day activities of having CVC.
- Information on when they should contact the hospital e.g. signs of possible infection, pain at exit site.
- Before discharge from hospital, patients and/or carers should be taught how to safely manage their CVC and be provided with written guidance to support this.
- Ongoing support should be available to patients with a CVC and their carers.
- Verbal and written information is to be provided for all patients and/or carers on how to access support both during and outside normal working hours.

Staff MUST check as part of discharge process that patient has received this information.
Table 1: Troubleshooting – A quick reference guide for managing CVC complications (HYYCN, 2009)

<table>
<thead>
<tr>
<th>Presenting symptom/s</th>
<th>Potential problem</th>
<th>Possible cause</th>
<th>Recommended actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest pain&lt;br&gt; Dyspnoea&lt;br&gt; Tachycardia/irregular pulse&lt;br&gt; Hypotension</td>
<td>Air embolism or Atrial fibrillation</td>
<td>Air entering the venous system during insertion or catheter use</td>
<td>Seek urgent medical advice/emergency admission</td>
</tr>
<tr>
<td>Pain on inspiration and expiration, dyspnoea</td>
<td>Pneumothorax</td>
<td>Air entering the space between the plural lining and the lung</td>
<td>Seek urgent medical advice/emergency admission</td>
</tr>
<tr>
<td>Tingling&lt;br&gt; Loss of movement down part or all of the affected limb&lt;br&gt; Shooting pain</td>
<td>Nerve injury</td>
<td>Damage to the nerves in the local area can occur</td>
<td>Contact the cancer centre/unit for medical advice</td>
</tr>
<tr>
<td>Coughing&lt;br&gt; Ear/neck pain on the side of insertion/palpitations or arrhythmia’s&lt;br&gt; Inability or difficulty aspirating blood (See flow chart )&lt;br&gt; Swelling of neck, chest arm or leg.&lt;br&gt; Shoulder tip pain</td>
<td>Catheter malposition</td>
<td>Catheter in the wrong place</td>
<td>Contact the cancer centre/unit x-ray may be required</td>
</tr>
<tr>
<td>Swelling of neck, chest, arm or leg&lt;br&gt; Skin discoloration&lt;br&gt; Skin temperature changes&lt;br&gt; Infusion difficulties&lt;br&gt; Inability to aspirate blood</td>
<td>Thrombosis in vein</td>
<td>Thought to be caused by damage to vein wall causing the release of thromboplastic substances that cause platelets to collect at injury site. These may grow into a larger thrombus or small bits break away and cause occlusion of a vessel elsewhere</td>
<td>Seek urgent medical advice/emergency admission</td>
</tr>
<tr>
<td>Pain redness along the vein, tracking and swelling. For PICC lines – if post 10days insertion consider whether chemical phlebitis or infection. Mechanical phlebitis less likely after 10 days insertion</td>
<td>Mechanical phlebitis/ infection</td>
<td>Irritation of the vein due to movement of the catheter in the vein (not associated with tunnelled CVCs but can occur with PICC’s)</td>
<td>Ensure the line is appropriately secured. If less than 10 days ensure the patient is applying heat packs as advised. Refer to Cancer centre/unit for advice, may require anti inflammatory or antibiotic medication</td>
</tr>
<tr>
<td>catheter</td>
<td>Blood present in the lumen of the catheter</td>
<td>Fault in catheter, or line flushed incorrectly</td>
<td>Flush the line using correct technique. If back flow continue seek advice from the secondary care provider</td>
</tr>
<tr>
<td>Inability to flush the line</td>
<td>Catheter occlusion&lt;br&gt; Pinch off</td>
<td>Line adhered together near clamp</td>
<td>Follow flow chart&lt;br&gt; Refer to secondary care</td>
</tr>
<tr>
<td>Presenting symptom/s</td>
<td>Potential problem</td>
<td>Possible cause</td>
<td>Recommended actions</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------</td>
<td>----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Difficulty in aspirating blood</td>
<td>Catheter occlusion syndrome</td>
<td>Line kinked or twisted Clot or fibrin sheath in catheter. Infusion stopped Drug precipitate blocking catheter. Lipids from TPN feed blocking catheter When the catheter is compressed between the clavicle and the first rib</td>
<td>Refer to secondary care provider Refer to the secondary care provider who will assess Secondary care provider to consider venogram to confirm patency dependant on the chemotherapy regimen. Medical consultation required.</td>
</tr>
<tr>
<td>Redness and tracking at site. Purulent discharge at site</td>
<td>Infection at insertion site</td>
<td>Infection at insertion site. Sheath has formed around the catheter tip</td>
<td>Refer to the Secondary care provider as applicable</td>
</tr>
<tr>
<td>Pyrexia of unknown origin, rigors. These may occur up to one hour after line has been flushed and should be investigated</td>
<td>Infection associated with the catheter</td>
<td>Infection</td>
<td>Refer to secondary care provider.</td>
</tr>
<tr>
<td>Leakage from the catheter when used. Damage visible</td>
<td>Damage to catheter</td>
<td>Use of a sharp object near the catheter or movement twisting of the catheter (PICC’s are vulnerable to fracture). High pressure on the syringe as injecting into the catheter.</td>
<td>Refer to secondary care provider for advice (NB Many CVCs can be repaired by cancer centre/ unit)</td>
</tr>
<tr>
<td>Line appears longer at the exit site or the cuff is visible. On measurement the length is on longer than upon insertion.</td>
<td>Line migration (Common problem for PICC’s)</td>
<td>Can occur with general activity, caution should be taken when removing dressings specifically PICC’s not to pull the line.</td>
<td>Refer to the secondary care provider for advice. X-ray to confirm the catheter tip may be required</td>
</tr>
<tr>
<td>Skin changes at insertion site - thickening of skin at point of insertion. - pink/red in colour.</td>
<td>Skin over granulation</td>
<td>Unknown - possibly due to inflammatory response of injured tissue, as prolonged and excessive inflammation</td>
<td>Discuss with the cancer unit/ centre A change of dressing may be indicated. Polyurethane foam dressings e.g. Lyofoam are...</td>
</tr>
<tr>
<td>Presenting symptom/s</td>
<td>Potential problem</td>
<td>Possible cause</td>
<td>Recommended actions</td>
</tr>
<tr>
<td>----------------------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>can lead to over granulation (Dunford et al 1999). The presence of a foreign body interfering with healing may also contribute (Harris and Rolstad 1994)</td>
<td>suggested for over granulation (Harris and Rolstad 1994).</td>
</tr>
</tbody>
</table>
Appendix 6: Background Information: Complications of CVCs (Cancer Services Central Venous Catheter Care Guidelines 2009)

1) Pneumothorax

A pneumothorax is the presence of air in the pleural space between the lungs and the chest wall. It can occur during the insertion of a CVC when a needle used to access the subclavian or jugular veins inadvertently punctures the lung. The risk of pneumothorax is considerably reduced when ultrasound guidance is used to access the veins. Since most CVCs used in Cancer Services are inserted in this way, a chest x-ray to screen for pneumothorax following insertion is no longer routinely carried out. If the catheter has been inserted using fluoroscopy to screen the tip position, then there will be no need for a post-insertion chest x-ray at all. However if the catheter has been inserted without fluoroscopy a post-insertion chest x-ray will still be required to check the tip position. The exception is with short term femoral CVCs. Here there is no risk of pneumothorax and the tip position is not routinely checked.

A pneumothorax may be clinically silent, or may lead to a life-threatening emergency situation with respiratory distress, reduced oxygen saturation levels, tachycardia or hypotension. A small pneumothorax may resolve spontaneously. In severe cases a chest drain may be necessary.

2) Infection

Infection is the most common complication associated with central venous access and one of the most serious with estimated mortality rates ranging from 1 – 35%.

Much effort has been put into reducing CVC infections across UCLH over the last few years, including the implementation of a “Central Venous Catheter Care Bundle” based on the Department of Health Saving Lives campaign and focusing on measures to reduce infection including skin preparation, use of standardised insertion packs, choice of catheters, securement techniques, exit site care, documentation and removal of CVCs as soon as they are no longer needed. For further information see the Infection Control page on the internal website. Contamination can occur during insertion of the CVC or at a later stage via the hands of healthcare workers, or transferred from the patient’s skin or other anatomical sites. Infection may be relatively minor or may be life-threatening.

Bacteria can colonise a CVC either on its exterior or interior surface: ie colonisation is either extraluminal or intraluminal. Extraluminal infections usually begin at the exit site and may remain confined to that area or may track along the catheter into the bloodstream. Intraluminal infections are caused by contamination via the hub of the catheter.

A Microbiology opinion should usually be sought in deciding the best action to take in the event of signs of infection. Exit site infections can often be treated successfully with antibiotics, especially in PICCs, and in tunnelled CVCs (Hickman lines) where the vein and the exit site are separated by the tunnel. In non-tunnelled centrally inserted CVCs, however, treatment is less likely to be successful, as there is less distance between the exit site and the bloodstream. By the same token, infections in tunnelled CVCs involving the skin tunnel itself above the cuff are notoriously difficult to treat and the same applies in implantable ports where there is infection of the port pocket.

The risk of infection can be reduced by strict adherence to Aseptic Non-Touch Technique.
Intravenous tubing and stopcocks should be changed according to the UCLH Infection Control Guidelines. If Parenteral Nutrition is to be given, one lumen should be used exclusively for this purpose.

3) Thrombosis

Thrombosis occurs when a clot develops within the vein around the catheter. Unless the clot is at the internal tip of the catheter, it will not usually affect the patency of the catheter. Thrombosis formation is a natural response to vascular injury. Damage to the vessel wall can occur during catheter insertion, or may be due to mechanical or chemical irritation in an incorrectly placed catheter eg where the tip of the catheter is in too small a vein, or rubbing against the vein wall instead of floating parallel to it.

The risk of thrombosis is increased in patients who are pregnant or immobile or who have diabetes or cancer. Surgery, chemotherapy, hormonal agents, haemodialysis and CVC-related infection are all thought to be risk factors. It used to be thought that minidose Warfarin might reduce the risk of thrombosis in Cancer patients, but this has recently been disproved.

Patients who develop thrombosis are at increased risk of pulmonary embolism and infection. A large proportion of cancer patients with CVCs have thromoses which are never detected. When a thrombosis does become symptomatic, it will usually cause swelling of the arm, neck, face or lower limb. There may be associated pain, tingling or numbness, distended neck or peripheral veins. The presence of a thrombosis can usually be confirmed by use of Doppler ultrasound. Clinically evident thrombosis is more common in cancer patients with PICCs than with tunneled CVCs or implantable ports, probably because they occupy smaller veins which are more easily occluded.

Unless the catheter is incorrectly positioned, it may be possible to treat a thrombosis using anticoagulants without removing the catheter.

4) Air Embolism

An air embolism is a potentially fatal complication. It can happen at any stage if air is allowed to enter the catheter – eg if a catheter is left unclamped when the cap is removed – but is most likely to occur during the insertion or removal of the catheter. The risk is increased if the patient is dehydrated, is unable to lie flat, or has an uncontrolled cough at the time of insertion or removal. As with pneumothorax, air embolism may be clinically silent or may be accompanied by any or all of the following: anxiety, cyanosis, dyspnoea, tachycardia, hypotension, chest pain, loss of consciousness and death.

5) Cardiac Arrhythmias

Atrial or ventricular arrhythmias can occur when the tip of the CVC is placed within the heart. In practice, non-tunneled and tunnelled CVC tips correctly placed in the right atrium rarely cause arrhythmias. PICCs are probably most likely to cause problems because the PICCs are more floppy and more likely to move within the vein than other CVCs. They can also move further into the heart as the patient moves his / her arm. Arrhythmias caused in this way will usually resolve when the catheter is pulled back by a few centimetres. Any patient experiencing unresolved palpitations or arrhythmias should be assessed by a medical team as soon as possible.
6) Cardiac Tamponade

This is a rare complication of CVCs, seen mainly in neonates. Cardiac tamponade arises when fluid (in this case blood) accumulates in the pericardial space around the heart and impairs cardiac function. This is a catastrophic, often fatal event. The patient is likely to exhibit a sudden onset of severe cardiorespiratory symptoms. Cardiac tamponade can arise in a patient with a CVC if the heart is punctured either during insertion or subsequently by a malpositioned catheter.

7) Patency Impairment

Patency is said to be impaired in any of the following situations:

- The catheter is completely blocked and cannot be flushed at all.
- The catheter can be flushed using a syringe but there is sluggish, absent or intermittent free-flow when infusion of fluids by gravity is attempted.
- The catheter flushes easily but aspiration of blood is sluggish or absent.

Patency problems should be taken seriously. Ignoring the early signs may lead to the development of more serious problems which cannot then be easily rectified – eg complete blockage or thrombosis.

The causes of patency problems include:

Clotted blood within the catheter: This can be avoided by good flushing techniques as described in these guidelines. When problems do arise, they can usually be solved relatively easily by use of a thrombolytic such as Urokinase: see section on “Maintaining Patency”.

Fibrin Sheath: Fibrin sheaths are thought to occur in most CVCs left in place for over 7 days. A fibrin sheath is a kind of sleeve made of a fibrous collagen substance which can form around the catheter within the blood stream. It may extend to form a kind of “sock” protruding beyond the tip of the catheter, and if this happens it may impair the patency of the catheter: most commonly it will prevent blood from being withdrawn from the catheter because the fibrin sheath is sucked against the tip of the catheter. In severe cases a fibrin sheath may also lead to backtracking of infused fluids between the fibrin sheath and the catheter, causing leakage of those fluids into the tissues. Fibrin sheaths may be diagnosed using fluoroscopy and are associated with an increased risk of infection as they provide an ideal medium for the proliferation of bacteria. They can sometimes be removed by stripping under imaging or by an infusion of a thrombolytic.

Mechanical obstruction: A mechanical obstruction can occur internally or externally. Internal obstruction may be due the catheter being incorrectly positioned: eg it may be kinked or the tip of the catheter may be resting against a vessel wall rather than floating free within the bloodstream (see Incorrect Position below). This might be due to poor insertion technique, or due to catheter dislodgement. A simple chest x-ray will often reveal an incorrectly positioned catheter. External kinking of the catheter can also cause patency problems: it’s worth checking for a bra-strap or an over-tight stitch before looking for a more complicated cause.

Build up of lipids from parenteral nutrition or drug precipitation within the catheter caused by too high a concentration or incompatibility of drugs: If this appears to be a likely cause of occlusion, consult Medical/Pharmacy advice for a suitable agent to dissolve occlusion.
8) Incorrect Position

A CVC should be considered to be in an incorrect position when any of the following apply:

- The tip is not in the right atrium, the superior or the inferior vena cava.
- The tip of the catheter is not floating freely parallel to the vein wall.
- The catheter is kinked within the body or pinched between internal structures.

Incorrect position may be the result of poor insertion technique or may occur spontaneously in a previously well-positioned catheter. It is not unknown for a CVC to “migrate” within the venous system for no apparent reason. Hadaway reports that “Changes in intrathoracic pressure, coughing, sneezing, Valsalva manoeuvre such as during heavy lifting, vigorous extremity use, forceful flushing, or congestive heart failure could lead to migration of the tip”. In addition the catheter may become dislodged if it is not correctly secured in place, or is accidentally pulled.

If a CVC is incorrectly positioned there is a high risk of thrombosis and patency impairment. If it is kinked internally there is also the risk that the catheter may split, leading to extravasation of drugs / fluids and in serious cases, embolisation of the catheter itself.

You should suspect incorrect position if there are patency problems despite the use of a thrombolytic, if the patient complains of pain on flushing, if the external length of the catheter increases, if the patient develops a thrombosis, or if the cuff of a tunneled CVC protrudes from the exit site.

A malpositioned, kinked or pinched catheter should be repositioned, replaced or removed as soon as practicable (except PICCs in certain situations discussed below). Leaving it in place for any length of time represents a high risk of thrombosis and/or catheter fracture / embolism. Immediately following insertion, PICCs are sometimes found on X-ray to have fed up into the jugular vein, across into the opposite subclavian, or back down an arm vein. In these cases it may be worth leaving the PICC in overnight or flushing briskly with 20ml 0.9% saline* and then repeating the X-ray as the PICC will often move into the Superior Vena Cava. Discuss with the person inserting the PICC and patient’s medical team.

9) Extravasation of Fluids / Drugs due to Incorrect Needle Position or Needle Dislodgement (in Implantable Ports)

The non-coring needle should be correctly placed into the port. If the needle is not inserted far enough into the port or if the needle misses the port altogether this may lead to fluids / drugs being infused into the subcutaneous tissues.

The needle may become dislodged if it is inadequately secured with dressing tape, if there is tension on the extension tubing or if the needle used is of insufficient length, causing the patient's normal movements to loosen the needle. The problem will usually be noticed when there is discomfort and/or oedema at the entry site combined with lack of free-flow of fluids.

If extravasation has occurred or is suspected, the needle should be removed and a fresh needle used to access the port correctly. If vesicant or irritant solutions (eg chemotherapy) are extravasated, seek advice from secondary care provider as applicable by patient.
10) Catheter Fracture

This may occur externally or internally and may result from over-forceful flushing, trauma to the catheter or incorrect position (eg kinking leading to wear-and-tear).

An external fracture will result in leakage of blood or fluids from the catheter. Sometimes there is an obvious fracture. The line must be clamped or folded over on itself immediately to prevent air embolism. Sometimes the catheter can be repaired or replaced over a guidewire but the advisability of this will depend on the patient's clinical status. In addition, unless the correct equipment and expertise are available for a repair to be carried out, the catheter should be removed immediately, as there is a high risk of infection and air embolism.

Internal fracture will usually result in patency impairment and/or pain, redness and swelling when the catheter is flushed. There is a risk that the catheter itself will embolise. If this occurs there may be no symptoms at all or there may be signs of pulmonary embolism, i.e. acute onset of any or all of the following - anxiety, pallor, cyanosis, shortness of breath, rapid weak pulse, hypotension, chest pain, loss of consciousness.

11) Separation of port and catheter (in Implantable Ports)

This is rare but should always be considered when problems arise with patency of the port or there is Extravasation with associated discomfort and oedema despite proper position of needle. As with catheter fracture (see catheter fracture section above) there is a risk that the catheter may embolise. Surgical removal or repair of the port and catheter is essential if separation is confirmed.
### Appendix 7: Equality impact assessment (EQIA)
#### Stage One: Screening of a policy, procedure, tender or strategy

<table>
<thead>
<tr>
<th>1. Name of policy, procedure, tender or strategy.</th>
<th>Guidelines for the management of central venous catheters in adults</th>
<th>2. Who has been consulted?</th>
<th>Members of PASC Palliative care Clinical Lead District Nursing service Head of Service- Lindsay Longfield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it a policy, strategy, procedure or practice?</td>
<td>To ensure that practice across BACHS is safe and is based on current best practice guidelines by focusing on:</td>
<td></td>
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<tr>
<td></td>
<td>• preventing infection to reduce the incidence of catheter related bloodstream infection (CRBSI)</td>
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<tr>
<td></td>
<td>• management of the potential complications of CVCs</td>
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<tr>
<td></td>
<td>• maintaining catheter patency and preventing any damage to the device and in essence improving the quality of life of the patient.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Main aims</td>
<td>To standardise the management of CVCs across BACHS and to ensure that staff caring for the patient with central venous catheters have access to guidelines and procedures to prevent complications occurring.</td>
<td>4. How has the policy been explained to those most likely to be affected?</td>
<td>Community nursing staff are expected to implement the policy. As a result:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>➢ It will discussed at clinical staff team meetings</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>➢ Patients and their carers will be consulted on an individual basis</td>
</tr>
</tbody>
</table>
Collecting and collating existing information and data

Please indicate in the table below whether the policy, strategy, procedure or tender has the potential to impact adversely on the equality target groups.

<table>
<thead>
<tr>
<th>Equality target group</th>
<th>1. Is the policy <em>likely</em> to have a potential differential impact with regards to the equality target group listed?</th>
<th>2. How have you arrived at the conclusions in box 1?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 = no</td>
<td>i. Who have you consulted? (appropriate individuals/groups internally and externally)</td>
</tr>
<tr>
<td></td>
<td>1 = little</td>
<td>ii. What have they said?</td>
</tr>
<tr>
<td></td>
<td>2 = medium</td>
<td>iii. What information/data have you interrogated?</td>
</tr>
<tr>
<td></td>
<td>3 = high</td>
<td>(library search, complaints data, PALS, research reports, local studies, advice from internal and external specialists)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>iv. Where are the gaps in your analysis?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>v. How will your paper promote the equality duties if they apply?</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Older people</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Young people</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Early years</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The policy is for adults and therefore will only impact individuals who are over 18 years. A separate policy is available for children.</td>
<td></td>
</tr>
<tr>
<td>Disability</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Sensory disabilities</td>
<td>Only if over 18 and have a CVC in situ</td>
<td></td>
</tr>
<tr>
<td>Physical disabilities</td>
<td>0</td>
<td>No evidence of adverse impact</td>
</tr>
<tr>
<td>Learning disabilities</td>
<td>0</td>
<td>Patients and their carers as applicable will be consulted on an individual basis</td>
</tr>
<tr>
<td>Mental health</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>same as above</td>
<td>No evidence of adverse impact</td>
</tr>
<tr>
<td>Women</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Transgender</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td>Minority ethnic communities Gypsies and travellers</td>
<td>0 same as above</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Religion or belief</td>
<td>Christian Muslim Hindu Buddhist Sikh Jew Other</td>
<td>0 same as above</td>
</tr>
<tr>
<td>Sexual orientation</td>
<td>Lesbian Gay men Bisexual</td>
<td>0 same as above</td>
</tr>
</tbody>
</table>

Summary

Is a more full equality impact assessment required? **NO**

Please describe the main points arising from the initial screening here that support your decision

The guidelines was developed as a result of the NPSA’s safety alert (NPSA, 2008) which requests that all NHS organisations ensure that relevant guidance available locally reflected the requirement for the minimisation in the use of heparin as a flushing solution in central access devices. In effect this guideline will only affect patients that have a central venous catheter in situ and are over 18 years of age, receiving treatment irrespective of equality group. Patients will be consulted on an individual basis for any possible implications affecting the equality strands as indicated above.

Policy lead conducting impact assessment:

Approved by (member of the equality and diversity team): Lynne Carter, Head of Equality and Diversity

Date:
Appendix 8: Procedural Document Checklist

To be completed by the document sponsor prior to submission to the relevant committee for approval.

<table>
<thead>
<tr>
<th>Title of document:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>To be submitted to which committee?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1. <strong>Title</strong></th>
<th>Yes/No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the title clear and unambiguous?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is it clear whether the document is a guideline, policy, protocol or care pathway?</td>
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<th>2. <strong>Introduction</strong></th>
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<td>Is the purpose of the document clearly stated?</td>
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<td>Is sufficient information given to place the document in context?</td>
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<th>3. <strong>Scope</strong></th>
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<td>Have any key limitations of the scope been made clear?</td>
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<th>4. <strong>Key roles and responsibilities</strong></th>
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<td>Are key roles and responsibilities clear and unambiguous?</td>
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<th>5. <strong>Format and style</strong></th>
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<th>6. <strong>Content</strong></th>
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<td>Does the document present information in a clear and logical manner?</td>
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Are the requirements of the document reasonable and achievable? (eg training and competency, equipment, staff capacity)

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7. **Evidence Base**

- Have key sources of information been checked?
- Has relevant evidence been appraised and used appropriately?
- Are key sources referenced?

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8. **Equality impact assessment**

- Has the equality impact assessment being completed and attached as an appendix?

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9. **Consultation**

- Has sufficient consultation been undertaken?

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10. **Implementation and monitoring**

- Is it reasonable to expect immediate implementation of this document?
- Are the stated monitoring arrangements reasonable and achievable?

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11. **Development and consultation**

- Is a summary of the document’s development and consultation processes attached as the final appendix?
- Were there any particularly contentious issues to be managed during this process? If yes, how were they resolved or do they remain contentious?

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Further comments:
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Appendix 9: Summary of policy development and consultation

In 2008 the National Patient Safety agency recommended the use of heparin flushes in all devices, including complex central venous or arterial catheters, should be minimised.

Patients with central venous catheters (CVC) referred into BACHS services come from a number of hospital trusts each with their own view / perspective for the management of CVC.

Therefore, this guideline aims to ensure that practice across BACHS is safe and based on current best practice guidelines focusing in particular on:

- Preventing infection
- Managing complications in CVC
- Maintaining catheter patency

The guideline also aims to standardise the management of CVCs across BACHS and to ensure that staff caring for patients with a CVC in situ have access to guidelines to support and ensure competence of staff in preventing complication.