# BARTS AND THE LONDON NHS TRUST

## GUIDELINES FOR THE USE AND MANAGEMENT OF PERIPHERALLY INSERTED CENTRAL VENOUS CATHETERS (PICCS)

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### RELATED POLICIES

- Prevention of Infection And Management Of Long-Term Central Venous Catheters and Ports (BLT/GUI/34510/IC)

  Policy No. 10 Standard Precautions including Hand Hygiene and Use of Protective Equipment and Management of Inoculation and Contamination Incidents. BLT/POL/25708/IC

- Prevention of Central Venous Catheter and Peripheral Cannula Related Infection. BLT/GUI/27008/IC

- Guidelines for the use and management of Cuffed Tunnelled Central Venous Catheter (CVC) (Hickman / Groshong lines)

- Guidelines for the use and management of Implantable Port Central Venous Catheter (PICC)

- Policy for the Administration of Injectable Medicines in Clinical Areas BLT/POL/12709/PHA
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INTRODUCTION/PURPOSE OF THE GUIDELINES

1. 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. These Guidelines relate to peripherally inserted central venous catheters (PICC). For other types of CVC refer to the relevant device Guideline. The Guideline must be read in conjunction with the Trust Core Guidelines for the Prevention of Infection and Management of Long Term CVCs and Ports (BLT/GUI/34510/IC).

2. The aim of the guidelines is to ensure that the peripherally inserted central venous catheter is managed appropriately and risk of infection relating to the CVC is minimised. The Guidelines are written to ensure compliance with the Department of Health “Saving Lives” programme and are compliant with epic2 Guidelines (Pratt et al 2007).

APPLICATION: TO WHOM THESE GUIDELINES APPLY

3. These Guidelines must be adhered to by doctors and all intravenous (IV) accredited nursing staff caring for a patient with a PICC. These guidelines are also intended to be used by any staff who are caring for a patient who is contemplating having a PICC to aid with patient decision making. The Guidelines apply to patients in all clinical areas of the Trust. Failure to comply with these Guidelines will result in increased risk of complications and infection related to the CVC.

PICCs:

4. A PICC is a fine bore CVC inserted into a peripheral vein – usually the basilic or brachial vein and threaded upwards towards the heart. Tip position is verified by chest x-ray following insertion (unless the tip has been screened during insertion using Fluoroscopy) and should be situated in the lower third of the Superior Vena Cava (SVC).

5. PICCs, like tunnelled lines, are intended for long-term use in patients who require long term infusions of fluids, blood products, drugs and parenteral nutrition. They may also provide access for routine blood sampling.

6. Unlike tunnelled Lines, PICCs do not possess a “cuff” to secure the catheter. There is nothing to keep the PICC in place unless it is secured to the skin of the patient’s arm using steri-strips and a Statlock®. Checking the external length of the PICC must be a routine part of care before administering drugs or fluids. The insertion length should be confirmed against the original insertion document (ie Insertion and Removal Device Record form).

7. PICCs can be single or double lumen. Each lumen provides independent access to the venous circulation, so that incompatible drugs/fluids may be administered simultaneously.
8. Each lumen of a PICC is equipped either with an integral clamp, or integral valve. The clamp or valve serves to seal the catheter and guard against air entry, haemorrhage and infection. Valved PICCs vary in design: the valve may be at the internal tip of each lumen (e.g. the Groshong PICC) or may be situated in the external end of the catheter (e.g. the PASV PICC).

9. Patients may return home with a PICC in situ and therefore patient education regarding the recognition and reporting of complications is of great importance. The PICC usually exits onto the patient’s arm and so it is generally not practical for the patient to care for the catheter him/herself. Liaison with the primary health-care team is vital.

10. The PICC should not be confused with a “midline catheter” which is usually 20cm in length, with the tip terminating in the region of the axillary vein, and is designed for short-term peripheral drug delivery, (Todd 1999). A midline catheter is not a Central Venous Catheter.

### Insertion of PICC

11. Insertions of PICCs should take place as a planned procedure in a designated area, such as interventional radiology, theatre, or approved ward areas. Only specially trained
clinical staff deemed competent in PICC insertion are allowed to perform this procedure unsupervised.

12. **Intended benefits:** Long-term intravenous access and blood sampling without the need for repeated venepuncture.

13. **Risks associated with PICCs**
   - Serious risks: Infection, thrombosis (blood clot), embolism, cardiac tamponard.
   - Other risks: Abnormal heart rhythms, phlebitis, malposition of the PICC, blockage of the PICC, failure to bleed back and split or breakage of the PICC.

14. **Preparation for line insertion**
   Prior to the procedure, the patient’s suitability must be assessed (Gabriel et al 2005) –
   - Whether a PICC is the best option for this patient:
     o Could the treatment be given peripherally?
     o Will treatment be of short duration so manage with a non tunnelled CVC
     o Would a Cuffed Tunnelled line be preferable?
     o Would an implanted port be more suitable?
   - The patient’s anxiety levels: would they benefit from sedation prior to line insertion?
   - The patient’s vital signs and general status. If sepsis is present treatment should be commenced prior to PICC placement.
   - The patient’s central venous catheter history including any problems, reasons for previous line removal etc
   - Any relevant past medical history, specifically taking note of any -
     o History of thrombosis. A PICC must not be attempted where there is an existing thrombosis in a vein. If the patient has experienced previous CVC-related thrombosis, anticoagulation should be considered for this patient. An examination of the central venous system by a radiologist may be needed if there are multiple venous thromboses and there is a risk of SVC obstruction
     o History of axillary lymph node clearance, lymphoedema, and / or axillary radiotherapy (eg for breast cancer. Ideally a catheter should not be placed on the side of the affected arm).
     o Past (or present) fracture of clavicle could alter venous patency
     o Cellulitis near the insertion site
     o Allergies to any of the materials used in PICC placement
     o Cardiac history. If the patient has unstable cardiac rhythms, X-Ray guidance will help avoid causing further arrhythmias during insertion. If the patient has a mechanical heart valve the guidewire or line tip must not enter the heart during insertion
   - The patient’s haematological profile:
     o FBC and coagulation screen must be done if there are reasons to think it will be abnormal (eg haematological cancer, chemotherapy, warfarin)
     o Platelets: If the platelet count is below 50, give a dose of platelets prior to line insertion. If platelet count has been falling, levels should be checked on the day of insertion
     o INR/ APTTR should ideally be 1.5 or below
Patients on Warfarin should be carefully managed. **Discussion with the patient’s medical team is essential**, but management will usually entail:

- Stopping Warfarin four days prior to insertion
- Starting low-molecular weight heparin (LMWH eg Fragmin) three days prior to insertion
- Checking INR on the morning of line insertion.
- Recommencing Warfarin (if prescribed) following successful line insertion. Patients on LMWH will need to continue until target INR is reached.
- For outpatients this will require careful coordination between the medical team, anticoagulation clinic, community nurses and GP. The inpatient team requesting the CVC will be responsible for coordinating this care.

Patients on Heparin

- If on a prophylactic dose of LMWH, there is no need to carry out a clotting screen.
- If on a therapeutic dose of LMWH no clotting screen is necessary but the CVC should be inserted 24 hours after the last dose, if given daily dose or after12 hours of a BD dose. If the patient is on IV heparin, discuss management with patient’s medical team. This can be stopped 4 – 6 hours prior to CVC insertion.

**Consent:**

15. Formal written consent for line insertion should be obtained. Please refer to Trust Core Policy “Policy for Consent for Examination and Treatment” BLT/POL/10910/HGC.

16. For further detail on PICC insertion, please see separate guidelines for PICC line insertion (soon to be available on Trust website)

**General care of a PICC**

17. **Exit Site Care:**

   **NB Always use aseptic non-touch technique when caring for PICC exit site.**

   Always fix catheter firmly to patient’s skin using Steri-strips, Statlock® and a transparent semi-permeable dressing (Bishop et al 2007)

18. **Dressings:**

   - **Post-insertion**: gauze, steristrips and Statlock® under a transparent semi-permeable dressing for 1 day  (may be longer for outpatients).
   - **After 1 day**: Biopatch®, steristrips and Statlock® under a transparent semi-permeable dressing. Change every 7 days (or sooner if dressing becomes wet, soiled or detached).
   - If patient cannot tolerate transparent semi-permeable dressing, use gauze-type dressing (e.g. Mepore) and change twice a week or more often if necessary for inspection or adherence.

Refer to 1-page Line Care Essentials.
### Action | Rational
--- | ---
Remove the old dressing using an aseptic non-touch technique | Minimise risk of infection
If there is loose blood or exudates present, remove with sterile gauze soaked in 0.9% Sodium Chloride | Saline prevents protein rich material adhering to the line
Clean with 2% chlorhexidine, 70% isopropyl alcohol solution using a 30 second back and forth friction rub and allow to dry | Friction will remove a greater percentage of skin flora and chlorhexidine will remain on the skin for up to 48 hours
Apply new chlorhexidine impregnated disc (Biopatch ®) to insertion site. Do not apply if patient sensitive to this dressing. | To minimise risk of blood stream infection
Apply new semi-permeable transparent dressing. Ensure the date of dressing change is clearly visible on the dressing | Integrity of dressing is viable for up to seven days. Changing dressing more frequently exposes the site to unnecessary contamination.
Document findings during dressing change in the patient’s health care record. | Monitor and record condition of line exit site.

19. Bathing, showering & swimming:
   - Patient should not get the dressing wet. If possible use a waterproof covering for bathing and showering (e.g. Limbo or Bathguard).
   - Swimming: Not permitted.

20. General Points relating to PICC line care:

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess external length of PICC before use</td>
<td>To confirm PICC tip position in SVC.</td>
</tr>
<tr>
<td>Take care at all times not to pull PICC out</td>
<td>Remember there’s nothing to keep the PICC in apart from the dressing.</td>
</tr>
<tr>
<td>Avoid compression to vein containing the PICC. Do not use blood pressure cuff on arm containing PICC. Any bandage or tubular dressing must be loose.</td>
<td>To avoid pressure and reduce the risk of line complications.</td>
</tr>
</tbody>
</table>
Following insertion, apply heat pad for 15 minutes, 3-4 times a day for the next 72 hours

The PICC should never be used for power-injection of contrast medium

Prevent venous spasm and mechanical phlebitis

This may cause the catheter to split

Infection Prevention and Management

21. Infection is the most common complications associated with all types of CVCs and one of the most serious.

- You must be familiar with the latest Trust Infection Control Policy No. 10 and Trust Guidelines for the Prevention of Infection and Management of Long Term CVC’s and Ports when caring for patients with a cuffed tunnelled CVC.
- Decontaminate hands before and after each patient contact using correct hand hygiene procedure.
- Always use aseptic non-touch technique when accessing the PICC line.
- Inspect the skin around the PICC line exit site for signs of infection (at least once per shift if patient in hospital and prior to each use).
- Take action immediately if there are signs of CVC-related infection. These include:
  - Tenderness, inflammation and or pain in arm or at the PICC site
  - Clinical evidence of Systemic Inflammatory Response Syndrome criteria (SIRS)
    - Temperature >38°C or <36°C
    - Heart Rate >90 bpm
    - Respiratory Rate >20 bpm
    - WCC >12 x 10^9/L or <4 x 10^9/L
    - Malaise
  - Document all findings in the Health Care record

See section on managing complications

- PICCs should be removed as soon as possible if they are not needed

Maintaining patency

22. Assessing Patency of PICCs

NB Always use aseptic non-touch technique when accessing the PICC line.

- Do not administer drugs fluids or chemotherapy unless the line is fully patent. By fully patent it is meant that:
  - There is flashback of blood
  - The line can be flushed easily
• If the PICC is not fully patent see Patency Problems section but note that community nurses or relatives caring for the PICC administering a weekly flush to an unused lumen are not routinely required to check for flashback.

• Testing for patency:
  o Test for flashback of blood before administering IV medication but note that you should not discard blood unnecessarily.
  o To assess for flashback attach a syringe containing 10mls 0.9% sodium chloride to the catheter, flush 2ml 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.

23. Flushing PICC line

NB Always use aseptic non-touch technique when accessing the CVC

<table>
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<tbody>
<tr>
<td><strong>Wipe clean the needle-free bung (Bionector®) with Chlorhexidine 2% in 70% isopropyl alcohol (eg Sanicloth 2% ®) and allow to dry for 30 seconds</strong></td>
<td>Decontaminate the bung and reduce risk of introducing infection into the blood stream</td>
</tr>
<tr>
<td><strong>Before flushing</strong></td>
<td></td>
</tr>
<tr>
<td>If there are vasoactive drugs in the lumen, withdraw prior to flushing.</td>
<td>To avoid giving bolus of the drug.</td>
</tr>
<tr>
<td>Using a brisk push-pause technique flush with:</td>
<td></td>
</tr>
<tr>
<td><strong>10 mls 0.9% sodium chloride between incompatible drugs / infusions or after blood sampling</strong></td>
<td>Helps to clear the line of any debris</td>
</tr>
<tr>
<td>Flush each unused lumen at least once a week (2 x 10mls 0.9% saline). Increase to twice weekly if there are patency problems.</td>
<td>To maintain patency</td>
</tr>
</tbody>
</table>

Patient Education

24. If patient is discharged with PICC line in situ:
  • Make arrangements for the PICC line to be flushed at least once a week or twice weekly if there are patency problems. This is can be arranged by referring patient to the community district nursing team.
  • Patients/relative may wish to learn to flush the line.
• Ensure patient has copy of relevant patient information leaflet
• Ensure patient is aware of care required
• Ensure patient is aware of the importance of reporting complications and has a contact number for this purpose (RCN 2010)

Removal

25. PICCs should be removed once they are not needed.
   • **Removal is normally a planned procedure**
   • Any qualified clinician familiar with caring for PICC lines.

26. **Procedure:**
    Always use an aseptic, non touch technique when removing a PICC

<table>
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<th>Rationale</th>
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<tbody>
<tr>
<td><strong>Patient should be sitting/lying</strong> with the PICC exit site below the level of the heart</td>
<td>This will help prevent air embolism</td>
</tr>
<tr>
<td><strong>Remove the dressing and stat lock.</strong> Take swab if signs of infection.</td>
<td>To identify micro-organism</td>
</tr>
<tr>
<td><strong>Pull PICC out slowly and gently</strong> a cm or two at a time. As each cm goes by, change the position of your hand so that your fingers are close to the exit site as you pull.</td>
<td>This will reduce the likelihood of the catheter breaking</td>
</tr>
<tr>
<td><strong>If you meet resistance, STOP.</strong> Apply warm packs to the patient’s arm for about 5 minutes before resuming. If there is still resistance, call the clinician familiar with the PICC insertion</td>
<td>Resistance may be due to venospasm</td>
</tr>
<tr>
<td><strong>Once PICC is out, apply pressure to exit site</strong> with sterile gauze for 3 minutes. Then apply an occlusive dressing (i.e. Mepore®).</td>
<td>To minimise bleeding</td>
</tr>
<tr>
<td><strong>Check that the PICC tip is present on removal</strong> (this is recognised by a rounded black tip on the line)</td>
<td>To ensure line is completely removed</td>
</tr>
<tr>
<td><strong>If systemic infection is suspected,</strong> use sterile scissors to cut off the tip of the catheter and without contaminating it drop it into a dry sterile specimen pot. Send it to microbiology for culture.</td>
<td>To identify organism</td>
</tr>
<tr>
<td><strong>Apply sterile dressing. Keep wound dry for 1 to 2 days or until healed</strong></td>
<td>To prevent infection</td>
</tr>
</tbody>
</table>
MANAGING COMPLICATIONS OF PICCS

**Systemic infection**

27. Pyrexia plus or minus: rigor after flushing, sore throat, generally feeling unwell, hypotension, tachycardia, shock (Krzywda 1999, INS 2006)

- **Possible cause:**
  - Catheter Related Blood Stream Infection

- **Management:**

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<tr>
<th>Action</th>
<th>Rationale</th>
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<tbody>
<tr>
<td><strong>Urgently refer to medical staff.</strong> May be treatable without catheter removal depending on patient’s clinical status and colonising organism. Microbiology opinion must be sought.</td>
<td>Early detection and management can reduce severity of infection</td>
</tr>
<tr>
<td><strong>Take peripheral and line blood cultures as per Trust guidelines.</strong></td>
<td>Cultures taken from both line and peripheral stab can help to identify the source of infection</td>
</tr>
<tr>
<td><strong>TPR &amp; BP. Frequency will depend on patient’s clinical status.</strong></td>
<td>Monitor vital signs for possible deterioration</td>
</tr>
<tr>
<td><strong>If there are signs of PICC site infection see below.</strong></td>
<td></td>
</tr>
</tbody>
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**Local infection**

28. Inflammation and tenderness at the exit site, or venous cord

- **Possible cause:**
  - Infection
  - Local skin irritation or sensitivity

- **Management:**

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
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</thead>
<tbody>
<tr>
<td><strong>Take a swab</strong></td>
<td>To help identify organism if present</td>
</tr>
<tr>
<td><strong>Change dressing to alternative if irritation appears to be dressing related</strong></td>
<td>Irritation maybe due to dressing</td>
</tr>
</tbody>
</table>

11
Refer to medical staff. Microbiology opinion must be sought regarding which antibiotic line lock to use when appropriate. The CVC may need to be removed if unable to treat infection.

If exudate present, line will need to be removed.

4 hourly TPR & BP if patient in hospital

If patient also shows signs of systemic infection, see also above.

To commence correct treatment

To minimise spread of infection

To detect deterioration in condition

Catheter patency problems

29. The catheter is sluggish, or there is no flashback of blood, or there is complete blockage.

- Possible causes:
  - Clotted blood in catheter
  - Fibrin sheath (which may be diagnosed using fluoroscopy)
  - Malpositioned catheter
  - Kinked or twisted catheter
  - Build up of lipids (Parenteral Nutrition)
  - Drug Precipitation

(Baskin et al 2009)

Management

30. No flashback of blood or Catheter flow is sluggish

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask the patient to take deep breaths and try different positions. Flush briskly using 10mls 0.9% sodium chloride. If this fails use a thrombolytic.</td>
<td>Deep breathing creates pressure changes in the chest and position changes will move the line position which may be sufficient to allow flash-back of blood.</td>
</tr>
<tr>
<td>If lipids/drug precipitation suspected consult pharmacy advice for suitable agent to dissolve occlusion.</td>
<td>Precipitated drugs can block catheters and can potentially be dissolved by altering the chemical environment of the drugs.</td>
</tr>
</tbody>
</table>

31. Catheter is completely blocked or sluggish line fails to respond to above

- Use a 3-way tap technique to instil thrombolytic into catheter (see below).
- What is a thrombolytic?
  - A thrombolytic is a drug capable of breaking up a thrombus.
  - Urokinase is a commonly used thrombolytic for unblocking CVCs. An alternative drug used is Alteplase (t-PA).
  - A thrombolytic must always be prescribed.
Heparin and Heparinized saline are NOT thrombolytics: they are capable only of inhibiting thrombus formation

- When should you use a thrombolytic? Use a thrombolytic to improve patency in the following situations:
  - flashback of blood is absent
  - free-flow of fluids is sluggish or intermittent
  - resistance is felt when flushing
  - the catheter/lumen is completely blocked

32. How to use a thrombolytic (Mayo 1989 Baskins 2009)

Management:

<table>
<thead>
<tr>
<th>Arrange prescription. (Caution if patient’s clotting is severely deranged or if high doses of an anticoagulant are being given concurrently.)</th>
<th>Thrombolytics are prescription only medications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draw up the thrombolytic as per the Trust drug monograph</td>
<td>To ensure correct concentration and dose</td>
</tr>
<tr>
<td>Instil the thrombolytic into the catheter and wait 2 hours (or preferably longer if possible). Do NOT force the thrombolytic into the catheter if the lumen is completely blocked: see Using a Thrombolytic in a Completely Blocked Catheter (below).</td>
<td>Forcing the agent into the line risks fracturing the line or dislodging the port</td>
</tr>
<tr>
<td>Assess the catheter again. It is best to flush the catheter with 0.9% sodium chloride prior to attempting to obtain flashback; otherwise there is a risk of creating a further blockage in the line before you have cleared it.</td>
<td>There is no need to worry that you are flushing the thrombolytic into the patient: small doses can be flushed into the patient without danger unless the patient has exceptionally deranged clotting</td>
</tr>
<tr>
<td>If full function has not returned instil the thrombolytic again and leave in for longer – several hours or overnight if possible.</td>
<td>The fact that Urokinase has a half life of 20 minutes once it is in the patient’s system is irrelevant to how long it carries on working while still in the catheter. This explains why leaving it in longer is often more effective</td>
</tr>
<tr>
<td>If the procedure fails to restore function consider whether lipids / drug precipitation could be causing a blockage. If not, refer to medical staff: a chest x-ray may reveal malposition of the line.</td>
<td></td>
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</tbody>
</table>
33. Using a Thrombolytic in a Completely Blocked Catheter

Attach 3-way-tap & syringes see below. (NB 3-way taps are now contraindicated for routine IV use but are still available for this procedure. Always use a 3-way tap without an extension set)

Diagram 1.

- **Three-way Tap Technique**

   ![Diagram of a catheter with a three-way tap and syringe](image)

   - **Urokinase**
   - **Empty syringe**

   Attempting to create a vacuum in the catheter will cause the thrombolytic drug to be pulled down further into the catheter, increasing the chance that it will come in contact with the clot blocking the line.

   - **Open clamp (if there is one).**
   - **Open stopcock** to the empty syringe and the blocked catheter.
   - **Pull back on the plunger** of the empty syringe. You will need to pull quite forcibly.
   - **Maintain suction** with one hand and with the other hand turn stopcock so it is closed to the empty syringe and open to the syringe containing thrombolytic, which will be sucked into the catheter.
   - **Leave for several hours or overnight.** Do not clamp catheter as this will prevent the thrombolytic from penetrating into the line.
   - **After this time, assess the catheter by attempting to flush the catheter using 0.9% sodium chloride in a 10ml syringe.** Do not use excessive force.
   - **Do not use excessive force.**
   - **Do not aspirate.** It is best NOT to try aspirating before flushing at this stage as you may block the catheter again.

   To create a vacuum in the empty syringe

   Opening the stopcock between the vacuum and the line creates vacuum in the line and draws in thrombolytic into the line. Don’t worry if it seems that very little thrombolytic is sucked in: even a tiny volume will reach several cm into the catheter.
If the catheter is still completely blocked, repeat the procedure: this may need repeating up to three times before it works. Sometimes leaving the thrombolytic in overnight seems to help. Don’t worry about overdosing the patient: if the catheter is blocked none of the drug will actually have been flushed into the blood stream.

Once the catheter can be flushed, and only then, check for flashback. If flashback is absent, administer thrombolytic as described above. Drawing back on the line first can cause further blockage.

If the procedure fails despite three attempts consult medical team with a view to removing the catheter.

34. What if the thrombolytic fails to restore function?

Management:

If a thrombolytic used correctly (see below) fails to restore function, contact medical team. A chest x-ray may need to be carried out to check the position of the line. If a chest x-ray shows that the catheter is correctly placed, it may be worth investigating further using fluoroscopy which may reveal a fibrin sheath.

If the cause could be a build up of lipids from 
Parenteral Nutrition or drug precipitation consult pharmacy advice for a suitable agent to dissolve occlusion. Thrombolytic drugs will be ineffective against drug precipitation.

Pain, swelling or leakage at PICC site

35. Pain or visible swelling when PICC is used or fluid leaks from external catheter when PICC is flushed.

- Possible causes:
  - PICC tip placement may be incorrectly positioned: check before taking any other action
  - Malposition of catheter / migration
  - External length increased (as recorded on the Insertion and Removal Device Record)
  - Breakage of the PICC
  - Fibrin Sheath (which may be diagnosed using fluoroscopy)
Management:

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stop using the catheter.</strong></td>
<td>Risk of drug infiltrating subcutaneously</td>
</tr>
<tr>
<td><strong>External length increase</strong>: patient needs</td>
<td>For confirmation of tip placement. An incorrectly positioned catheter must be removed.</td>
</tr>
<tr>
<td>chest x-ray</td>
<td></td>
</tr>
<tr>
<td><strong>Refer to medical staff:</strong></td>
<td>An incorrectly positioned catheter should usually be removed. Internal fracture cannot be repaired. If there is a fibrin sheath severe enough to cause leakage the catheter should be removed.</td>
</tr>
<tr>
<td><strong>Leak or breakage of PICC (external):</strong></td>
<td>For confirmation of tip placement.</td>
</tr>
<tr>
<td>competent staff to repair PICC and then x-ray</td>
<td></td>
</tr>
<tr>
<td><strong>Chemotherapy:</strong></td>
<td>To limit the possible damage caused by the drug.</td>
</tr>
<tr>
<td>follow NELCN Cytotoxic Policy if extravasation occurs.</td>
<td></td>
</tr>
<tr>
<td><strong>If it is found that the catheter is fractured or faulty complete Incident (Datix) Form.</strong></td>
<td>In order to ensure follow-up if device is at fault</td>
</tr>
<tr>
<td>Record the make and lot number on the incident form.</td>
<td></td>
</tr>
</tbody>
</table>

**Pain or swelling of arm, neck or shoulder**

36. With or without distension of neck / peripheral veins

- Possible cause:
  - Thrombosis.
  - Mechanical Phlebitis

Management

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Refer to medical staff</strong></td>
<td>For investigation of suspected thrombosis. It may or may not be possible to treat thrombosis without catheter removal.</td>
</tr>
<tr>
<td><strong>If patient shows signs of infection, see guidance on managing infection above.</strong></td>
<td>Thrombosis and infection often occur together.</td>
</tr>
</tbody>
</table>

**Palpitations / Abnormal ECG**

37. Palpitations/Abnormal EGC

- Possible causes:
  - Cardiac arrhythmias related to CVC
Management:

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>If occurs on insertion try pulling out the line by 1 cm at a time until palpitations stop</td>
<td>Adjusting the line may resolve the arrhythmia</td>
</tr>
<tr>
<td>If patient is distressed or unwell as a result of abnormal rhythm, call for urgent medical assessment and monitor vital signs</td>
<td>Incorrectly positioned CVC can lead to arrhythmias.</td>
</tr>
</tbody>
</table>

38. Cardiopulmonary symptoms
- These may include any of the following: respiratory distress / failure apnoea, reduced O₂ saturation levels, tachycardia, bradycardia, hypotension, pallor, cyanosis, anxiety, chest pain, loss of consciousness
- **Possible causes:**
  - Air or catheter embolism
    - Pulmonary embolism
    - Cardiac tamponade / pericardial effusion

Management:

<table>
<thead>
<tr>
<th>Action</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Call for medical assistance / Critical Care Outreach Team / resuscitation team</strong></td>
<td>Medical emergency</td>
</tr>
<tr>
<td><strong>Administer O₂</strong></td>
<td>First line drug in emergency situation</td>
</tr>
<tr>
<td><strong>Monitor vital signs</strong></td>
<td>As baseline and to monitor effects of any treatment.</td>
</tr>
</tbody>
</table>

Name of Author: Raquel Villanueva
Designation: Senior Sister, 7A (Paget Ward), SBH
Date: 9\(^{th}\) March 2010
References:


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**Stewart Elaine** Clinical Nurse Specialist Cancer Services BLT
Appendices