Vascular Access Device Policy

This procedural document supersedes: PAT/T 73 v.3 – Vascular Access Device Policy

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Executive Sponsor(s):	Chief Nurse
Author/reviewer: (this version)	Carol Scholey, Infection Prevention & Control Practitioner
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Target audience:	Clinical Staff

Amendment Form

Please record brief details of the changes made alongside the next version number. If the procedural document has been reviewed **without change**, this information will still need to be recorded although the version number will remain the same.

Version	Date Issued	Brief Summary of Changes	Author
Version 4	October 2022	• Page 6 procedural guidance – length of stay for PICC line • Page 12 link on complication and troubleshooting updated • Page 19 on Appendix 1 Central Venous Catheter Insertion Checklist • Page 24 – Appendix 4, change heading Updated reference	Carol Scholey
Version 3	April 2021	**Amendment** • Page 9 – regarding post CVC insertion, checks must be done (instead of should) and 3 checks must be done (not one of them) and 1 to be done at earliest opportunity • Evidence of all the checks must be documented in notes (again not one of the checks)	Amended by: Padma Gopal Clinical Director Anaesthesia, Pain and Critical Care
Version 2	August 2020	**Amendment** • Page 8 – additional guidance regarding bleeding added • Page 9 – confirming satisfactory placement of the CVC added • Page 16 – added annual auditing requirements by anaesthetist	Amended by: Liam Wilson - Head of Patient Safety and Experience Carol Scholey - Lead Nurse IPC Padma Gopal – Consultant Anaesthetist
Version 1	July 2019	• New policy - merged Central Venous Access Devices (CVADs) Care and Management Policy - PAT/T 23 v.5 and Peripheral Venous Cannula (PVC) Management Guidelines – PAT/T 45 v.3 • Please read in full.	Paula Johnsin and Jayne Wicks; IPC Practitioners

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1 INTRODUCTION

Venous Access Devices are an essential part of medical care and the choice and management thereafter can have a significant effect on patient safety.
Although the incidence of local or blood stream infections associated with Peripheral Venous Catheter (PVC) is low, serious complications can occur because of the frequency in which the PVC is used (RCN 2016, NICE 2013). Through the application of best practice, complications and infections can be reduced.

Central Venous Access Devices (CVADs) are used for short and long-term care. These devices enable the administration of fluids, drugs, blood products, parenteral nutrition, sampling of blood and central venous pressure monitoring. Catheter related blood stream infections (CR- BSI) associated with the insertion and maintenance of CVADs remains a significant risk to patients and a burden to the NHS (EPIC 3). All Vascular Access Devices must be used in accordance with the manufacturer's guidance.

2 PURPOSE

The guidance content is based on national guidelines for the management of Venous Access Devices and sound infection prevention and control principles.

The purpose of this guidance is to promote the appropriate and safe use of Venous Access Devises throughout the Trust, and provide guidance for staff.

The use of Vascular Access Devices in Neonatal/Paediatrics patients and Total Implanted Vascular Access Devices (Ports) for haemodialysis purposes are not covered in this policy.

3 DUTIES AND RESPONSIBILITIES

Operator should be a competent practitioner following appropriate training and Trust approved assessment of competence.

Infection Prevention and Control are responsible for ensuring implementation by monitoring audit results.

Ward and Department Managers are responsible for ensuring implementation within their area, and for ensuring all staff who work within the area adhere to the principles contained in the Policy.

Consultant Medical Staff are responsible for ensuring their junior staff read and understand this policy, and adhere to the principles contained in it at all times.

Divisional Management Teams are responsible for monitoring implementation of this guidance and for ensuring action is taken when staff fail to comply with the policy.

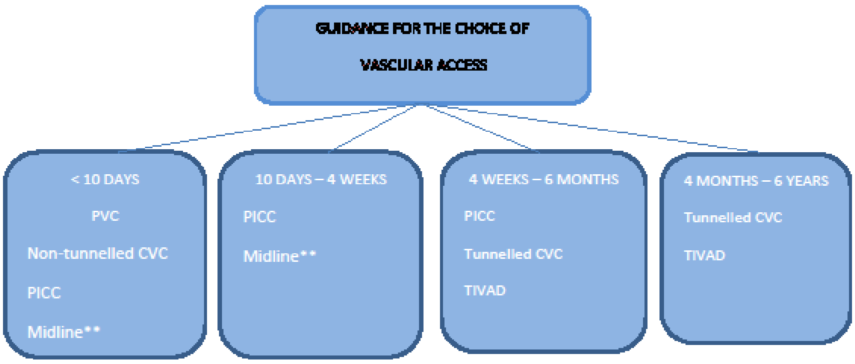
Site Co-ordination Teams and Bed Managers are responsible for ensuring patients are placed in accordance with this guidance, and for escalating any situations where safe placement cannot be achieved.

On-call Managers are responsible for providing senior and executive leadership to ensure implementation of this guidance, and for ensuring infection risks are fully considered and documented when complex decisions need to be made regarding capacity and patient flow.

Board of Directors - Their role is to support the implementation of a Board to Ward culture to support a Zero Tolerance approach to Health Care Associated Infections.

4 PROCEDURAL GUIDANCE

The requirements of the patient will determine the type of Venous Access Device used.



****Caution**

MIDLINES ARE NOT CENTRAL LINES and therefore must NOT be used for any therapy which is to be given centrally.

POINTS TO CONSIDER PRIOR TO PLACEMENT OF CVAD

- Is there a genuine need for IV therapy which must be delivered via a central line
- What is the anticipated duration of therapy
- Relevant PMH: e.g. coagulopathy, cardiac or respiratory dysfunction, surgery/trauma or radiotherapy to chest or neck
- Abnormalities of vascular anatomy e.g. previous central vein stenosis, DVT of upper limb or insertion of a Superior Vena Cava stent
- Future access needs e.g. Avoidance of potential vein damage where AV* fistula is required for dialysis
- Has there been any previous problem with CVAD insertion
- Any local infection.
- Is the patient able to lie flat
- Is the patient allergic to local anaesthetic, sedation, dressing or cleaning solution
- Are there staff on the ward who are competent*
- Patient factors: cognitive function
- Patient preference/lifestyle issues/body image

Epic 3: National Evidence-based Guidelines for Preventing Healthcare Associated Infections in Hospitals in England

UK Vessel Health and Preservation Framework

https://www.3mlearning.co.uk/media/1155/vhp-poster.pdf

PATIENTS LACKING CAPACITY

Sometimes it will be necessary to provide care and treatment to patients who lack the capacity to make decisions related to the content of this policy. In these instances staff must treat the patient in accordance with the Mental Capacity Act 2005 (MCA 2005).

- A person lacking capacity should not be treated in a manner which can be seen as discriminatory.
- Any act done for, or any decision made on behalf of a patient who lacks capacity must be done, or made, in the persons Best Interest.
- Further information can be found in the MCA policy, and the Code of Practice, both available on the Extranet.

There is no single definition of Best Interest. Best Interest is *determined on an individual basis. All factors relevant to the decision must be taken into account, family and friends should be consulted, and the decision should be in the Best interest of the individual. Please see S5 of the MCA code of practice for further information.*

5 GENERAL PRINCIPLES

5.1 Insertion

PVCs

1. **Aseptic Technique –** Insert peripheral vascular access device utilising aseptic technique including hygiene

2. **Site Selection –** Carry out assessment of a patient's veins prior to insertion of a vascular access device. Site selection should include a consideration for patient comfort and should avoid crossing a joint e.g. the antecubital fossa, wherever possible.

3. **Skin Preparation –** Patient's skin should be prepared with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity povidone-iodine application is used)

4. **Dressing –** A sterile semi-permeable dressing is applied to the vascular access device that allows the site to be observed.

5. **Documentation -** Documentation included; date, time and reason for insertion. Vessel Health Assessment, details of site preparation. The types and size of the vascular access device should be recorded.

CVADs

1. **Aseptic Technique -** Device is inserted using an approved aseptic technique.

Full sterile barrier precautions (Gown, mask, eye protection, sterile gloves and full body drape) must be used during catheter placement. Full body drape is necessary to reduce risk of CVAD wire becoming contaminated during insertion.

Hand hygiene in the form of surgical hand scrub should be undertaken when performing this procedure.

2. **Site Selection -** Ultrasound (USS) should be used for all jugular insertions and should also be considered for all other routine placements of central lines.

Subclavian site is preferable to jugular for non-tunneled lines and non-dialysis lines, anatomical complications should be considered. However, the expertise of the inserter may need to guide the choice of site, as subclavian lines are considered more difficult to insert, with true ultrasound visualization difficult to achieve and particular skill is required in managing complications including pneumothorax.

Femoral veins should be avoided wherever possible. However, femoral lines may be considered a valid option, in the absence of a skilled CVAD inserter, particularly in bedbound, continent patients who have mild / moderate coagulopathy or concomitant anti-platelets. If used in an emergency there should be a documented plan for replacement.

3. **Skin Preparation -** The chosen site should be meticulously cleaned with sterile 2% chlorhexidine gluconate in 70% isopropyl alcohol solution, extending out to wide margins and be allowed to air dry before breeching the skin.

Use an alcoholic povidone-iodine solution for patients with a history of chlorhexidine sensitivity.

4. **Dressing & securement -** A sterile semi-permeable dressing is applied.

Any stabilization devices should not interfere with the observation of the site.

5. **Documentation -** Documentation includes: date, time and reason for insertion. Vessel Health Assessment (if appropriate), details of site preparation. The type and size of the vascular access device should be recorded.

OTHER CONSIDERATIONS

Evidence based practice suggests that non tunneled Central Venous Access Devices account for the majority of Catheter Related Blood Stream infections. (Epic 3)

Prior to insertion of catheter, please ensure the appropriate consent is obtained in accordance with trust policy (PAT/PA 2).

All planned placements of CVADs should be undertaken in radiology department, anaesthetic room, theatre, intensive care units, or clinical area designated fit for this purpose. **Bedside placement should not occur except in an emergency.**

In emergency situations when ultrasound equipment and/or expertise is not immediately available, use anatomical landmark methods.

Replacement of short term catheters under a guide wire exchange is no longer considered acceptable- Biofilm develops onto the line very quickly and the absence of external signs of infection is a very poor marker of true absence of infection.

When using ultrasound, the operator must ensure the sterile probe cover and gel are used to reduce the risk of contaminating the sterile field.

Catheters should be chosen with the appropriate number of lumens, based on an assessment of the minimum number considered necessary (EPIC 3 2013).

The Central Venous Catheter Insertion Checklist document must be completed when inserting a CVC. **Appendix 1.**

5.2 Initial Care CVADS- Post Insertion

Secure catheter with appropriate securement device e.g. Stat-lock® for PICC, sutures or stat-lock® for jugular or subclavian and sutures for tunneled lines.
Where initial oozing occurs, sterile gauze may be used but the site should be cleaned and redressed with the approved sterile, transparent, semi-permeable dressing within 48 hours.
If excessive bleeding, further investigation maybe required to rule out the source of bleeding.

Confirming satisfactory placement of the CVC

The following checks (1, 2 and 3) must be undertaken before use:

1. Confirm that the CVC lies within a blood vessel by checking that blood can be aspirated freely from each lumen of the CVC (this will not identify whether this is in an artery or a vein).
2. Confirm that the blood vessel is a vein rather than an artery. There are several ways to determine this. The gold standard is transducing which should show (if inserted into vein) a venous waveform. Venous pressure can be measured by manometry but is rarely performed now.
3. Blood gas analysis (In an emergency situation this must be done but should not delay lifesaving treatment).

The following check to be undertaken at the earliest clinical opportunity:

4. Chest x-ray to confirm satisfactory position of the CVC tip and exclude mechanical complications, such as pneumothorax. Chest x-ray to be done at the earliest clinical point.

- On a chest x-ray, for upper body CVCs, the tip of the CVC should lie at the level of the right main bronchus or within the 2 cm above this point.
- The risk of vessel erosion and perforation is increased if the tip of the CVC is perpendicular to and touching the side wall of a vein. If necessary the CVC should be

withdrawn to achieve a satisfactory position; for left internal jugular and left subclavian approaches this may mean that the CVC tip sits in the brachiocephalic vein.

(Evidence of the above checks must be documented in the notes/checklist)

All lumens should be flushed with Normal Saline to check patency of lumens prior to the use of the catheter.
Length of PICC from insertion site to anchorage point must be measured and documented on the CVAD IPOC, to help detect if PICC has dislodged.
Needle free connector should be connected to all lumens; to reduce the risk of needle stick injury.

Ensure that all sharps are used and disposed of in accordance to the Trust Policy (PAT/IC 8).

The CVAD insertion must be documented in the patients' medical records, including date, time, site, clinician, size and type of device, batch number, reason for insertion and confirmatory check.ongoing management and care

6 ONGOING MANAGEMENT AND CARE

PVCs
An Aseptic Non Touch Technique (ANTT) should always be maintained whilst dealing with PVC.

Hands must be decontaminated prior to and after accessing PVC.

Wear personal protective equipment only when indicated and in accordance with the standard Precautions policy. Gloves and apron should not compromise hand hygiene.

PVC should be reviewed daily and if not accessed within the prior 48 hours or if there are signs of infection/phlebitis, they should be removed immediately and a swab sent for culture and sensitivity.

Indication of ongoing need and vessel health should be documented at least once a shift. The insertion site should be visually inspected at each intervention for signs of infiltration, extravasation, and leakage. At a minimum of once each shift a visual infusion phlebitis (VIP) score should be recorded.

The site should be inspected and using VIP score for signs of phlebitis (Loveday et al 2014). Needle free access device should be either single or double extensions depending on clinical indications.

Access ports and catheter hubs are decontaminated with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry before and after accessing the device (If the patient has a sensitivity povidone-iodine in 70% alcohol application is used).

A peripheral cannula should be flushed using a pulsatile flush (ending with positive pressure) before and after each use to check for patency prior to administration of a medication, and at least daily if not in use, using 0.9% sodium chloride.

PVC Dressings - Sterile, transparent, securing dressing must be changed using the aseptic technique at a minimum, every 7 days or sooner if the integrity of the dressing is compromised. E.g. loose, damp or soiled. The insertion site should remain visible through the dressing.

Cleaning of the access site should be carried out with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity povidone-iodine in 70% alcohol application is used) at each dressing change.
Transparent dressings particularly moisture permeable dressings, should not be bandaged as the visibility and moisture permeability are obscured.

PVC administration set replacement
Giving sets should be labelled with the date and time to ensure they are changed at correct intervals.

IV administration sets should be changed as follows:

72 hours	Continuous infusion of clear fluids
24 hours	Lipids
After 2nd unit, after transfusion episode or at 12 hours, whichever is sooner	Blood or blood products
Platelets must be transfused through new giving sets	Platelets
Administration sets to be discarded after each use	Intermittent infusion

CVADs
Indication of ongoing need vessel health should be documented at least once a shift, vascular access devices are removed when no longer indicated or if there are signs of infection/phlebitis.

Central lines must be monitored closely, assessed at each access and the CVAD IPOC completed once daily. This should include documentation of the CVAD VIP*- see appendix 2.

Daily risk assessment for the continued requirement of the CVAD should be recorded in the medical records. Lines should be removed as soon as no longer clinically indicated to reduce the risk of complications.

Length of PICC from insertion site to anchorage point must be measured and documented daily on the CVAD IPOC to help detect if the PICC has dislodged.

To access a CVAD you must have completed the 272 Clinical Skills Training Package, be up to date with 272 Anaphylaxis (complete e-learning every two years) and also be competent with

272 Clinical Skills Training Package IV Administration, revalidate the practical part of the skill and refresh e – learning every three years.

Always use an aseptic technique; ensuring hands are decontaminated in line with the 5 moments of hand hygiene.

CVAD lumens should be flushed before and after every use, and all lumens at least once daily if not in use. Draw up 9ml of 0.9% sodium chloride ensure wiping the pod (before breaking the seal) and CVAD lumen for 30 sec and dry for 30 sec with 2% chlorhexidine in 70% Isopropyl wipes. Draw back 1ml of blood to turn saline rose colour checking for clots. Flush with the now 10ml rose 0.9% sodium chloride using push pause technique.
The lumen must always be aspirated before flushing to check patency.
For all CVADs (excluding renal) always use a 10ml syringe; smaller syringes Create high pressure that will damage/rupture the line.

Flushing with sodium chloride is recommended in general clinical areas.

Specialized areas such as Haematology, Oncology, Critical care, Paediatrics and Renal will have local protocols for use of heparin flushes. Contact the Trust's Pharmacy for advice.

Taking bloods from a CVAD should not be a routine occurrence.

A skin decolonisation agent e.g. Prontoderm foam ® must be used daily in accordance with manufacturer's instructions.

Weekly MRSA screen should be undertaken–Nose, groin and CVAD site.

CVAD administration set replacement

Administration sets for continuous infusions are changed, at a minimum, every 96 hours.

Administration sets in continuous use for blood and blood components should be changed every 12 hours, or when transfusion is complete. Platelets must be infused through new giving sets.

Giving sets are labelled with the date and time to ensure they are changed at correct intervals. TPN administration sets should be changed when the TPN has finished or 24 hours after commencement of the infusion.

TPN must be delivered via a dedicated lumen and bung.

Blood products can be administered concurrently with another drug/infusion (including TPN) through a dual bore catheter (BCSH 2007).

Needle free connectors should be replaced according to manufacturer's instructions (e.g. currently 7 days /120 uses for Swan- locks® and 200 uses for Max plus® devices) or sooner if device appears faulty.

CVAD dressing

After the initial insertion phase, sterile, transparent dressing should be changed, using the aseptic technique, at a minimum, every 7 days or sooner if the integrity of the dressing is compromised. Dressings should be replaced by trained and competent staff.

Cleaning of the access site should be carried out with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution and allowed to air dry. (If the patient has a sensitivity, povidone-iodine in 70% alcohol application can be used) at each dressing change.

The aim of this dressing is to minimize the contamination of the insertion site and provide stability of the device.

The dressing choice is-Chlorhexidine impregnated transparent semi-permeable dressing (CHG) recommended for patients receiving TPN or considered high risk of infection. A sterile transparent semi-permeable dressing for all other patients.

Any stabilization device should not interfere with the observation of the site.

When removing dressing from PICC line; pull dressing towards the insertion site to reduce risk of dislodgement.

6.1 Complications and Trouble Shooting

Also see Appendix 3 & 4

CVADs

Lines which are visibly damaged should be considered for immediate removal-
Only extenuating circumstances, such as cardiac resuscitation could a faulty line be possibly left; and replaced when patient is stable.

Infection

Consider line related infection if there are clinical signs infection around the device and/or the patient triggers the Sepsis Pathway.

Obtain blood cultures – See Appendix 5. If the patient is having TPN, please take advice from the nutritional nurse if line required blood cultures.

Consider full sepsis screen on the patient.

Refer to the “Management of Catheter Related Bloodstream Infection (CRBSI), including Antibiotic Lock Therapy” on the Antibiotic Website.
https://oesn11hpbml2xaq003wx02ib-wpengine.netdna-ssl.com/wp-content/uploads/2021/11/CRBSI-2021.pdf

If the patient is receiving TPN seek advice from microbiologist and Nutrition team regarding the continuation of TPN while waiting for blood culture results.

If the line is removed, send the catheter tip for culture & sensitivity testing **IF** line related sepsis is suspected. Use sterile scissors to cut the tip (approximately 5cm) into a sterile universal container.

Do not routinely replace CVADs as a means to reduce infection.

<u>Thrombosis</u>
See Appendix 6

6.2 Removal

<u>PVC</u>
A Cochrane Review published in 2015 found no evidence to support changing PVCs every 72-96 hours. Therefore PVCs are now only changed if clinically indicated.

However PVCs should still be removed if no longer clinically indicated or there are signs of phlebitis, infection or thrombophlebitis or a VIP score of 2 or greater (see Appendix 2). Removal of the PVC should be an aseptic non touch technique.

The device should be removed carefully using a slow steady movement and pressure should be applied until haemostasis is achieved, to reduce the risk of haematoma formation.

This pressure should be firm and not involve any rubbing movement.

A haematoma will occur if the device is carelessly removed, causing discomfort and a focus for infection (Loveday 2014).

If site appears infected, obtain swab and send to microbiology for culture and sensitivity. Please complete a Datix.

The site should be inspected to ensure bleeding has stopped and should then be covered with a sterile dressing (Loveday 2014).

The cannula integrity should be checked to ensure the complete device has been removed RCN 2016.

Document removal on the PVC on the daily plan of care sheet.

This documentation ensures adequate records for the continued care of the device and patient as well as enabling audit and gathering of statistics on rates of phlebitis and infiltration.

CVADs

Remove any CVAD that is no longer required to reduce the risks of complications. The line should only be removed following authorisation from the medical team

Tunneled lines require referral to the vascular team for removal.
Routine line removals do not need the line tip sending for culture.

Check if patient is on anticoagulants before removing the line- Blood results should be checked prior to removal for any clotting deficiencies.

Procedure
Explain the procedure to the patient, ensure the patient understands and gain valid consent.

Patient should be placed in the **Trendelenburg position** (head slightly lower than feet, can tilt the bed to achieve this) when removing the CVAD; if this is not possible then supine position is acceptable (NOT in an upright sitting position). This is to prevent risk of air embolism.

- Wash hands and don apron.
- Open sterile dressing pack using ANTT onto clean trolley and decant other sterile equipment onto the sterile field.
- Gel hands.
- Put on non-sterile gloves and remove transparent dressing. Remove tapes or securing dressing.
- Remove gloves, clean hands with gel and don sterile gloves from pack.
- Observe the site for signs of local infection.
- Clean site with 2% Chlorhexidine in 70% Isopropyl alcohol wipe for 30 seconds and allow drying for 30 seconds.
- Remove any skin sutures securing the catheter. (Central lines will be sutured).
- Hold sterile gauze over the insertion site.
- Ask the patient to perform the **Valsalva manoeuvre** (see definitions) and as patient is performing this manoeuvre hold the catheter with one hand near the point of insertion and with gentle traction, withdraw the line.
- As catheter begins to move, begin to press down on the insertion site with gauze.
- As the last centimetre is removed apply firm pressure to the site.
- If any resistance is encountered, do not force catheter.
- NB: Occasionally when removing a PICC the vein will go into spasm and cause resistance and the PICC may appear to be stretching as you withdraw it. If this occurs, pause for a moment, gently massage the arm above the PICC insertion site and resume gentle traction until the line is out. Always seek advice if problems persist.
- Maintain firm pressure for a minimum of 5 minutes after the catheter has been removed**.** (This may be longer for patients using anticoagulants). If site continues to bleed maintain pressure and inform Doctor.

- The patient can now be sat up around 45 degrees.
- Check the catheter tip is intact on removal (Central line only).
- The measurement of the PICC line once removed must be compared against the insertion length documented in the patient's notes.
- Routine line removals do not need the line tip sending for culture.
- When bleeding has stopped cover site with an occlusive dressing.
- Dispose of all equipment according to hospital policy.
- Leave patient comfortable and document date/time and reason for removal in patient's notes.

7 TRAINING/SUPPORT

Staff will receive instructions and direction regarding the management of Venous Access Devices used in Trust from a number of sources:-

- Trust Policies and Procedures available on the Intranet
- Ward/departmental/linemanagers
- Clinical Skills Training Package on PVC insertion & CVAD Access & Maintenance.
- Education update sessions which can be delivered by a number of formats e.g. face to face and e-learning.
- Advice is also available from the DBTH Intranet site.

Please note: The training requirements of staff will be identified through a learning needs analysis (LNA). Role specific education will be co-ordinated/ delivered by the topic lead. Alternatively, training may be accessed via an approved e-learning platform where available.

8 MONITORING COMPLIANCE WITH THE PROCEDURAL DOCUMENT

What is being Monitored	Who will carry out the Monitoring	How often	How Reviewed/ Where Reported to
Patients at high risk of Catheter Related Blood Stream Infections (CRBSI) : TPN patients	Nutritional Specialist Nurse	Weekly surveillance	Post Infection Reviews Deficits identified will be addressed via agreed action plan to comply with policy
Compliance with guidelines to reduce risk of complications	Infection Prevention and Control Practitioners and clinical areas	Monthly	Invasive device audits
Training needs for management of CVAD's	Ward and Department Managers Training and Education Department	Annually	Staffs Professional Development Appraisal. Attendance will be captured via ESR system
Regular audit of compliance with documentation on insertion/removal	Anaesthetist	Annually	Audit of compliance with documentation to comply with policy

9 DEFINITIONS

ANTT – Aseptic Non Touch Technique
AV - Arterio-Venous
CVAD - Central Venous Access Device
DVT – Deep Venous Thrombosis
IPOC - Integrated Pathway of Care
IV - Intravenous
PICC - Peripherally inserted central catheter
PMH - Past Medical History
PVC - Peripheral Venous Catheter
TIVAD -Total implanted vascular access device (port)
TPN - Total Parenteral Nutrition
VIP - Visual Infusion Phlebitis.

Bacteraemia - Bacteria in the circulating blood.

Best Interest -There is no single definition of best interest. Best Interest is *determined on an individual basis. All factors relevant to the decision must be taken into account, family and friends should be consulted, and the decision should be in the Best interest of the individual. Please see S 5 of the MCA code of practice for further information.*

Landmark method - This involves passing the needle along the anticipated vein using surface anatomical landmarks and knowledge of the anatomy as a guide.

Midline- Long venous catheter inserted into arm veins which does not extend centrally.

Paired cultures -Blood cultures taken, at the same time, from both peripheral and CVAD lumens.

Ports - Portacath devices are used generally in Paediatrics – not fitted at DBTH. Long term use.

Tunnelled Catheter – CVC which is tunneled away from exit site and has anchoring cuff.

Two Dimensional (2-D) -This provides a 'real time' grey scale image of the anatomy imaging Ultrasound.

Valsalva manoeuvre- exhalation against a closed airway, usually done by closing one's mouth, pinching one's nose shut while pressing out as if blowing up a balloon.

10 EQUALITY IMPACT ASSESSMENT

The Trust aims to design and implement services, policies and measures that meet the diverse needs of our service, population and workforce, ensuring that none are disadvantaged over others. Our objectives and responsibilities relating to equality and diversity are outlined within our equality schemes. When considering the needs and assessing the impact of a procedural document any discriminatory factors must be identified.

An Equality Impact Assessment (EIA) has been conducted on this procedural document in line with the principles of the Equality Analysis Policy (CORP/EMP 27) and the Fair Treatment For All Policy (CORP/EMP 4).

The purpose of the EIA is to minimise and if possible remove any disproportionate impact on employees on the grounds of race, sex, disability, age, sexual orientation or religious belief. No detriment was identified. (See Appendix 8)

11 ASSOCIATED TRUST PROCEDURAL DOCUMENTS

This policy should be read in conjunction with the following policies, particularly:

- Hand Hygiene (PAT/IC 5)
- Sharps Policy - Safe Use and Disposal (PAT/IC 8)

- Management of Sharps Injuries and Blood and Body Fluid Exposure Incidents (PAT/IC 14)
- Consent to Examination or Treatment Policy (PAT/PA 2)
- Mental Capacity Act 2005 - Policy and Guidance including Deprivation of Liberty Safeguards (DoLS) (PAT/PA 19)
- Equality Analysis Policy (CORP/EMP 27)
- Privacy and Dignity Policy (PAT/PA 28)
- Risk Identification, Assessment and Management Policy (CORP/RISK 30)
- Pathology Specimens - Collection and Handling of Pathology Specimens (PAT/IC 11)
- Fair Treatment for All (CORP/EMP 4)
- Injectable Medicines Policy (PAT/MM 5)
- Spillages of Blood and other Body Fluids (PAT/IC 18)
- Standard Infection Prevention and Control Precautions Policy (PAT/IC 19)
- Clinical Skill Training Package - PVC & CVAD
- Management of Catheter Related Bloodstream Infection (CRBSI), including Antibiotic Lock Therapy: https://www.dbth.nhs.uk/wp-content/uploads/2017/12/CRBSI-final.pdf

12 DATA PROTECTION

Any personal data processing associated with this policy will be carried out under 'Current data protection legislation' as in the Data Protection Act 2018 and the UK General Data Protection Regulation (GDPR) 2021.

For further information on data processing carried out by the trust, please refer to our Privacy Notices and other information which you can find on the trust website: https://www.dbth.nhs.uk/about-us/our-publications/information-governance/

13 REFERENCES

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APPENDIX 1 – CENTRAL VENOUS CATHETER INSERTION CHECKLIST

IPOC 1784
WPR48230
WHITE
April 2021

We care

Central Venous Catheter Insertion Checklist

NHS
Doncaster and Bassetlaw Teaching Hospitals
NHS Foundation Trust

AFFIX LABEL HERE IF AVAILABLE

NHS Number: ....
District Number: ....
Surname: ....
Forename(s): ....
Address: ....
....
D.o.B.: ....

Pre-Procedure Checklist

Patient ID checked	☐ Yes ☐ No
Allergies checked	☐ Yes ☐ No
Indication:	
Coagulation state reviewed (bloods/drugs)	☐ Yes ☐ No
USS, sterile cover & sterile gel all available	☐ Yes ☐ No
CVC pack available	☐ Yes ☐ No
Correct length line	☐ Yes ☐ No
Consent If "No", reason:	☐ Yes ☐ No

Time Out - Just prior to needle insertion

Patient position optimal	☐ Yes ☐ No
Team introduced and assigned roles	☐ Yes ☐ No
Correct length line	☐ Yes ☐ No
Assistant to monitor sterility throughout	☐ Yes ☐ No
Patient-specific concerns If 'Yes', reason:	☐ Yes ☐ No

Sign Out - Just prior to desterilising

Guidewire removed	☐ Yes ☐ No
Needle-free connectors attached (+ 3 way tap to monitoring lumen)	☐ Yes ☐ No
Sterility maintained	☐ Yes ☐ No
Sterile dressing applied	☐ Yes ☐ No
Post-procedure check CVP transduced (must be done)..........mmHg At earliest clinical opportunity: SO_2 on blood gas ....%	
CXR	☐ Yes ☐ No
Complications (if yes, document details and debrief overleaf).	☐ Yes ☐ No

Date & Time: ....

Operator: .... Supervisor: ....

Assistant: ....

Person completing form (title/name/signature):
....
....

CXR reviewed: Yes ☐ N/A (femoral) ☐ Date & Time: ....

Is the CVC safe to use? ☐ **Yes** ☐ **No** Title/Name/Signature: ....

Documentation of procedure - (if not on anaesthetic chart)

Location: DCC ☐ ED ☐ Theatre ☐ Other: ....

Type: (tick both if for double line insertions) CVC ☐ Vascath ☐ PICC ☐ PA Introducer ☐

Site: Right ☐ Left ☐ Internal jugular ☐ Subclavian ☐ Femoral ☐ Basilic ☐ Cephalic ☐

Anaesthesia: Lignocaine 1% ☐ Lignocaine 2 % ☐ Sedation ☐ General ☐

Length of line: 12.5cm ☐ 16cm ☐ 20cm ☐ Other: ....
Length at skin (cm): .... **Number of sutures:** ....

Asepsis: Hat, Mask, Scrubbed, Gown, Gloves ☐ Eye protection (optional) ☐ 2% chlorhexidine to skin and dried ☐ Sterile drape ☐ Sterility maintained ☐

Ultrasound-guided: Yes ☐ No ☐ – if "No", document reason below If "Yes", guidewire visualised in vessel Yes ☐ No ☐

Lumens: All aspirated, flushed, and clamped ☐

Complications:
None ☐ Pneumothorax ☐ Arterial puncture ☐ Malposition ☐
Haemorrhage ☐ 2nd person ☐ Unable to cannulate ☐ Other (document below) ☐

Debrief (if complications occur) & Comments:

Grade: .... Name: ....

APPENDIX 2 – CVAD VISUAL INFUSION PHLEBITIS SCORE

Site appears healthy

(Green)
Good
0

No sign of infection
Observe & record insertion site & score daily

Is one of the following evident?

- Pain near insertion site
- Erythema at insertion site
- Serous discharge

(Orange)
Caution
1

Possible insertion site infection

- Observe & record insertion site appearance & score daily.
- Take swab if red or discharge present, inform medical team.
- Drs to discuss with Microbiologist; if result is positive and continues to show signs of infection.
- Consider line removal/replacement.

Any of the following

- Inflammation (pain, redness, swelling, induration, purulent discharge)
- Hyperthermia > 38.3°C/ hypothermia < 36°C
- Chills with rigors
- Raised CRP and / or abnormal WCC (>12.0 or <4.0) with no other obvious source

(Red)
Immediate Action Required 2

Insertion site infection +/- Catheter suspected blood stream infection

- STOP using CVAD if possible.
- Swab insertion site, escalate to medical team immediately.
- Obtain paired blood cultures (peripheral & central venous access device, along with arterial line samples if patient is on DCC).
- Obtain bloods for FBC, CRP.
- Drs to discuss with Microbiologist; initiate antimicrobial therapy if advised.
- If line removed due to suspected infection, send tip for culture and sensitivity.

WPR39980 Nov 2013 WHITE

APPENDIX 3 – CVC COMPLICATIONS AND TROUBLE SHOOTING

Trouble Shooting Advice

NHS
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Problem	Potential Cause	Action
Unable to aspirate	Obstruction, suction against vessel wall, fibrin sheath, pinch off, kinked catheter or malposition.	Visually check for kinking. If no resistance, attempt to flush and then aspirate. Move arm up and extend outwards and re-attempt to aspirate. Request chest X-ray to check position of tip of PICC or Tunnelled line. Please note mid lines do not need to be aspirated and can be used as long as there is no resistance or pain on flushing with NaCl. **If PICC or Tunnelled line please contact the Radiology Vascular access team for further advice if required. DO NOT REMOVE THE LINE**
Unable to flush	Blood clot, thrombus within the lumen of the line. Drug precipitate (failure to flush correctly following administration) Pinch off Mal positioned tip	Check line for kinking. Attempt to aspirate. Change position of patient Change needle free connector and attempt to flush again. **If PICC/Mid or Tunnelled line please contact the Radiology Vascular access team for further advice if required. DO NOT REMOVE THE LINE.**
Swollen arm, hand or neck	Blood clot/thrombus around the line	Refer for a Doppler ultrasound scan to identify venous thrombosis. If a thrombus/clot is confirmed and if the line is functioning well (i.e. aspirates and flushes with ease), it **DOES NOT** need to be removed immediately. The patient will require therapeutic Dalteparin and ongoing review as per policy. **Please contact the Radiology vascular access team/haematologist for further advice.**
Catheter fracture / damage	Repeated clamping/bending. Sharp object e.g. scissors during dressing changes Use of small syringe to access line (e.g. 1ml, 2ml or 5ml). Faulty line	**ONLY** the manufacturer's clamps should be used on the line. If the line is fractured externally **DO NOT USE**; ensure the clamp is on and positioned between the exit site (patient) and the fracture. **Refer to the Radiology Vascular access team OR the critical care consultant for advice and to arrange line exchange/replacement.**
Fluid leakage at insertion site	Catheter rupture, fibrin sheath Pinch off Infection Limb Oedema	Flush line with 0.9% sodium chloride and observe for leakage. **If PICC/Mid or Tunnelled line please contact the Radiology Vascular access team for further advice if required. DO NOT REMOVE THE LINE.** **For critical care patients discuss with the critical care consultant.**
Inflammation/Exudate at the insertion site	Localised infection Poor aseptic non-touch technique Mechanical phlebitis Allergy/sensitivity to dressing.	Discuss with medical team. Swab for culture and sensitivity. **DO NOT REMOVE THE LINE**. Clean site with Chlorhexidine wipe (or alternative if patient is allergic) and apply new dressing. Ensure Line is secured with appropriate securement device. (E.g. Statlok /SecurAcath for PICCs) Consider the use of an alternative dressing if allergy/sensitivity is suspected.
Suspected Infection		**SEE VISUAL SCORE FOR CVAD AND GUIDANCE**
Catheter migration (PICC/Mid lines only)	Can occur if line is not adequately secured Accidental dislodgement during cleaning/dressing changes	Measure length of line from insertion site to anchorage point and document. If line migration/dislodgement is suspected, ensure the line is adequately secured and **contact the Radiology vascular access team for advice. DO NOT REMOVE THE LINE. DO NOT PUSH THE LINE BACK IN.** A chest x ray may be required to confirm the position of the tip of the PICC.
Exposed Dacron cuff (Tunnelled lines only).	Dislodgement of line.	The line will require removing due to the risk of contamination/infection. Refer to the Radiology Vascular access team for replacement of line.

APPENDIX 4 – PVC COMPLICATIONS AND TROUBLE SHOOTING

Complication	Cause	Action
Ecchymosis and Haematoma on insertion	Infiltration of blood into the tissue.	Remove PVC and apply light pressure over insertion site (RCN 2005). This can be prevented by procedure being performed by a skilled practitioner.
Phlebitis– this is inflammation of the vein wall (the intima) **Infection –** can occur at the insertion site or systemically. Prevention includes:	The most common causes are; Mechanical – related to irritation and damage to a vein caused by large gauge cannulas being sited where there is movement, for example antecubital fossa, not secured adequately or increased dwell time. Chemical – related to chemical irritation from drugs such as antibiotics and chemotherapy. Bacterial – when the site becomes infected due to poor hand washing or aseptic technique.	Prevention is key and includes appropriate device and vein selection:. • Dilution as per manufacturer's recommendations and administration at the correct rate. • Ensure that the cannula is secured using the correct method for the dressing used. • Make sure an aseptic non touch technique is used during insertion and ongoing accessing of the PVC. • Renew dressing when damp, loose or soiled or at 7 days. • Assess the site at each intervention and record VIP score at least daily. • Infusion should be discontinued at first signs of phlebitis. • Warm and cold compresses can be applied to area, to increase the flow of blood around the area and reduce the swelling. • If bacterial phlebitis is suspected, remove PVC, swab site and send
Thrombophlebitis	Dwell time PVC material Type of infusate Poor PVC/vein ratio	• Stop infusion immediately and notify medical team. • Cold compress can be applied to area to reduce blood flow and increase platelet adherence to the already formed clot. Then apply a warm compress. • If purulent discharge present, send sample to microbiology for culture. • Elevate extremity and discourage patient from rubbing or massaging area to reduce risk of embolus. • Use smallest gauge PVC possible for therapy being delivered.

Infiltration - occurs when there is leakage from the vein, and the infusate enters the surrounding tissue causing swelling. Fluid is cooler than surrounding body fluid and as skin temperature drops the skin becomes blanched. In severe cases necrosis (tissue death) can occur.	PVC punctured vein wall Chemical irritation Poor securement of PVC Complete occlusion(pressure around PVC in vein may result in the tip increasing the hole size made on insertion)	Prevention includes: • Good insertion technique. • Good fixation technique, clip excess hair and secure cannula properly. • Do not cannulate over a joint. • Use the smallest size cannula for the purpose of the PVC. • Check for swelling around the cannula tip. • Stop infusion and notify the Drs immediately. • Discuss with pharmacy to establish if any antidote and how to administer it. • Assess to determine the extent of the infiltration and volume of fluid absorbed. • Assess the range of sensation and movement of the patients extremity (for any sensory deficit)
Extravasation Inadvertent administration of vesicant or irritant solution into surrounding tissue. Vesicant solution can cause blisters, subsequent result is tissue necrosis.	Poorly sited PVC. Patency not checked for before administration of solution. Patient with thrombocytopenia or poor veins that cannot tolerate the volume or pressure of solution	• Stop infusion and inform Drs immediately. • Assess to determine the extent of the extravasation • Attempt to aspirate the fluid via PVC. • Discuss with pharmacy to establish if any antidote and how to administer it. • Elevate extremity. • Potential of saline flush out technique can be used by an experienced practitioner.
Thrombosis	This happens when a blood clot on the cannula wall of the vein becomes detached and enters the pulmonary circulation.	Prevention: • Use the smallest size cannula to adequately do the job required. • Avoid using veins in legs. **Do not flush the cannula if thrombo-embolism is suspected.** **Seek medical attention immediately.**

Unintended arterial cannulation	Pulsatile blood flow not present/not observed during cannulation. Increased risk in presence of: hypotension; hypoxaemia; obesity; sedation/anaesthesia; aberrant anatomy; proximity of arteries and veins ie antecubital fossa.	• If recognised immediately, **or before any drugs/substances given through the cannula**, remove as soon as possible. • Before removing ensure staff member available to stay with patient for at least 10 minutes. • Explain proposed management to patient. • Remove cannula and immediately apply very firm pressure for 3 minutes (enough to occlude the vessel). Release pressure gradually but maintain pressure for 2 more minutes. • Inspect wound. If still bleeding apply pressure as before. • If still bleeding re-apply pressure and call for senior help. • When bleeding stopped, apply swab firmly and secure with tape. Inspect wound after 15 minutes. Call for senior help if re-bleeds or haematoma is seen developing.

Unintended administration of drug/infusion through intra-arterial cannula.	As above.	• Stop administration of drug/infusion immediately. • Inform patient, give re-assurance, and explain proposed management. LEAVE CANNULA IN SITU – **DO NOT REMOVE.** • Call for senior help. Inject 20 mls 0.9% saline slowly through cannula (over 10-15 minutes). • Commence 0.9% saline infusion at 1ml/kg/hr (maximum 80 mls/hr) via syringe pump. • If possible elevate the limb. • Refer to on call vascular surgical team ASAP. • Document symptoms/signs in limb distal to the cannula. Especially note capillary refill time; any sensory changes; temperature change; presence of cyanosis. Continue these observations every 30 minutes until review by vascular surgical team. • Further management may include heparinisation; regional/nerve plexus block; anti-spasmodics (ie papaverine); surgical thrombectomy; long term rehabilitation; chronic pain management.

APPENDIX 5 – TAKING BLOOD CULTURES FROM A CVAD

<u>Blood culture sampling from CVAD (central venous access device) lines</u>

PAIRED cultures must be taken ASAP (paired means each lumen of the CVAD should be sampled alongside a peripheral one).

All samples must be taken at the same time.

Main points of blood culture sampling from CVAD

CVAD's should only be accessed by those trained to do so..
(For full training please contact Clinical skills)

ANTT should be adhered to at all times

↓

Needle free device should be cleaned for 30 secs with 2% chlorhexidine in 70% isopropyl alcohol

↓

1.Obtain sample aerobic bottle followed by anaerobic

DO NOT DISCARD ANY BLOOD FROM LUMEN

2. Repeat the process for each lumen *

3. Remove and replace needle free device on each lumen

4. Flush all lumens

→ Discard unused TPN and ensure IV fluids are prescribed and administered

*For multi lumen catheters (more than 2), such as central lines, sample the most frequently used/accessed lumens

↓

Label each sample according to lumen colour/use (TPN) and document all in medical notes

Contact microbiology for advice if required, re-culture if advised by micro

Send swab from CVAD site

Discuss with Nutrition Support Team (TPN patients) or radiology vascular access team before removing lines where possible

APPENDIX 6 – CVAD THROMBOSIS PATHWAY

CVAD THROMBOSIS PATHWAY

Presenting Symptoms

Any one of these signs is significant enough to require investigation:

- Pain in the arm, axilla, shoulder or neck
- Swelling of the fingers, hand or arm (rings are often tighter)
- Discolouration of the affected arm (usually darker blue / purple colour)
- Affected hand may be cooler to touch
- Engorged collateral veins

Investigations

Doppler/Ultrasound

If it is not possible to arrange Doppler within 24 hours treat as DVT until this has been excluded

Result Positive

Leave the line in if at all possible (even if thrombus occlusive)
Check FBC and U+E
Commence therapeutic dose of Dalteparin
(In situations where the indications for Dalteparin are not clear discuss with Haematologist)
Arrange District Nurse if required
Ensure patient has required equipment

Follow Up

Monitor patient, if symptoms worse or not responding to the treatment consider removal of the line.

Arrange for repeat FBC at 7 and 14 days
Patient should receive Dalteparin for minimum of 3 months.

If line still insitu after this period Dalteparin can be given at a reduced dose- 75% of treatment dose

Result Negative

Advise patient to contact hospital if symptoms worsen or fail to resolve

APPENDIX 7 – PVC VISUAL INFUSION PHLEBITIS SCORE (VIP)

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Visual Infusion Phlebitis Score (VIP)

All patients with a peripheral vascular catheter (PVC) device should have the site checked at least daily and each time the device is accessed, iv flow rate is checked and when the solution container is changed.

The VIP score must be documented at least daily in the plan of care sheet.

The PVC site must be observed:

- When bolus injections are administered
- When IV flow rates are checked or altered
- When solution containers are changed

Mark an X on the picture to denote site of PVC

Date of insertion: ....
Day No.: ....
Clinically indicated? ☐ Yes ☐ No
Removed? ☐ Yes ☐ No
VIP Score: ....
Signature: ....

IV site appears healthy. No pain	0	No signs of Phlebitis OBSERVE PVC
One of the following is evident: Slight pain near IV site Slight redness near IV site	1	Possible signs of phlebitis OBSERVE PVC
Two of the following are evident: • Pain near IV site • Erythema • Swelling	2	Early stages of phlebitis RESITE PVC
Two or more of the following are evident: • Pain along path of cannula • Erythema • Induration • Palpable venous cord	3	Medium stages of phlebitis RESITE PVC CONSIDER TREATMENT, IF SITE DISCHARGING PUS, SEND A SWAB

Key guidance

- Always use aseptic non-touch technique
- Use smallest gauge PVC for therapy
- Insert PVC away from joints
- Secure PVC with approved dressing
- Replace loose/soiled dressings immediately
- Remove PVC as soon as no longer required
- Scrub the hub with 2% chlorhexidine & 70% isopropyl before & after accessing the PVC
- Flush PVC pre & post drug administration with 5-10mls sodium chloride in a 10ml syringe. Follow local guidance for Paediatric/Neonatal patients.

Adapted from A. Jackson 1997. Revised by IPC Team 2019

WPR47000 July 2019

APPENDIX 8 - EQUALITY IMPACT ASSESSMENT PART 1 INITIAL SCREENING

Service/Function/Policy/Project/Strategy	Division	Assessor (s)	New or Existing Service or Policy?	Date of Assessment
Vascular Access Device Policy	Corporate Nursing. IPC	Carol Scholey	Exisiting Policy	01/08/2022

1) Who is responsible for this policy? Corporate Nursing. IP&C

2) Describe the purpose of the service / function / policy / project/ strategy? Who is it intended to benefit? What are the intended outcomes? This policy has been updated using the latest national guidance from EPIC 3. It informs staff of the need and use for CVAD lines, care and management.

3) Are there any associated objectives? Legislation, targets national expectation, standards: None

4) What factors contribute or detract from achieving intended outcomes? – Nil

5) Does the policy have an impact in terms of age, race, disability, gender, gender reassignment, sexual orientation, marriage/civil partnership, maternity/pregnancy and religion/belief? Details: [see Equality Impact Assessment Guidance] -

- **If yes, please describe current or planned activities to address the impact** [e.g. Monitoring, consultation] –

6) Is there any scope for new measures which would promote equality? [any actions to be taken] N/A

7) Are any of the following groups adversely affected by the policy?

Protected Characteristics	Affected?	Impact
a) Age	None	Neutral
b) Disability	None	Neutral
c) Gender	None	Neutral
d) Gender Reassignment	None	Neutral
e) Marriage/Civil Partnership	None	Neutral
f) Maternity/Pregnancy	None	Neutral
g) Race	None	Neutral
h) Religion/Belief	None	Neutral
i) Sexual Orientation	None	Neutral

8) Provide the Equality Rating of the service / function /policy / project / strategy – tick (✓) outcome box

Outcome 1 ✓	Outcome 2	Outcome 3	Outcome 4

If you have rated the policy as having an outcome of 2, 3 or 4, it is necessary to carry out a detailed assessment and complete a* **Detailed Equality Analysis form – see CORP/EMP 27.

Date for next review: **August 2025**

Checked by: **M. Boyack. Lead Nurse Infection Preventon & Control** **Date:** **01/08/2022**