



Frimley Health
NHS Foundation Trust

Cross Site Vascular Access and IV Therapy Clinical Guidelines Part 6: Peripherally Inserted Central Venous Catheters (PICCs)

Key Points

- The use of PICCs should be considered when patients present with difficult to access veins; for long term IV therapy; and to reduce the number of acute non-tunnelled short term CVC in the neck or femoral vein.
- This guidance will help practitioners with care and maintenance of the PICC once inserted and should be used alongside the Vascular Access LocSSIP (Part 2).

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Key words: Vascular access, peripheral cannula, PICC, midline, tunnelled catheter, implanted PORT, renal catheters, acute CVC, arterial catheter, difficult IV access, complications, Securacath, Statlock

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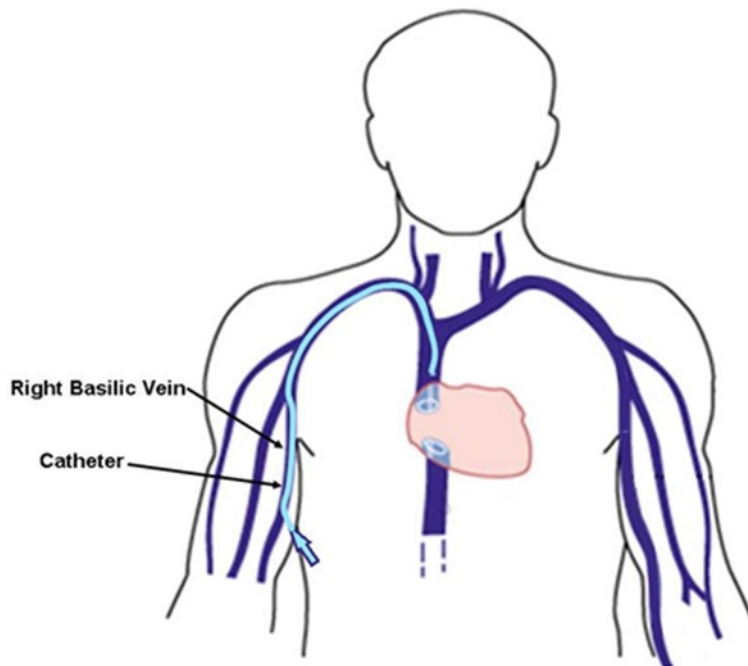
Abbreviations

ACF	Antecubital Fossa
ANTT	Aseptic Non-Touch Technique
COPD	Chronic Obstructive Pulmonary Disease
CRBSI	Catheter Related Blood Stream Infection
CVC	Central Venous Catheter
ECG	Electrocardiogram
GI	Gastrointestinal
IV	Intravenous
IVAS	Intravenous and Vascular Access Services
LocSSIP	Local Safety Standards
MC&S	Microscopic Culture and Sensitivity
NICE	National Institute for Health and Care Excellence
NIVAS	National Infusion and Vascular Access Society
NST	Nutritional Support Team
OPAT	Outpatient Parenteral Antibiotic Therapy
PICC	Peripherally Inserted Central Catheter
PN	Parenteral Nutrition
PSA	Procedural Sedation and Analgesia
PVC	Peripheral Venous Catheter
RIVC	Renal IV Catheter
SPN	Supplemental Nutrition
STA-CVC	Short Term Acute Central Venous Catheter
TCCVC	Tunnelled Cuffed Central Venous Catheter
TIIP	Totally implanted Intravenous Port
TPN	Total Parenteral Nutrition
VA	Vascular Access
VAD	Vascular Access Device
VasCath	Vascular Catheter

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1. PERIPHERALLY INSERTED CENTRAL VENOUS CATHETERS (PICCS)



Peripherally Inserted Central Venous Catheters (PICCs) can be **valved** or **non-valved**, clamped or non-clamped and power injectable. To reduce complications and maintain safety, the trust has standardised to one type of PICC: we use a power injectable valved polyurethane catheter.

- The insertion of PICCs is governed by the Vascular Access LocSSIPs. Only the Vascular Access team is permitted to place PICCs in the trust; this allows standardisation of the pre-assessment and insertion technique. This will avoid inappropriate vascular access devices being placed and ensure that the ECG method of placement is utilised for every PICC placement.
- All PICCs in the trust will be placed using the tip navigation and ECG confirmation technology. The only patients who will require a chest x-ray for confirmation will be those with an absent P wave. The technology can still be used as a guide but is not licensed in these patient groups to sign off tip location.
- PICCs can be used for administration of any IV therapy and can be used to withdraw blood samples.
- A PICC can be sited for treatment lasting a few days to many years depending on the type of IV therapy and how long the catheter remains patent.
- IV infusions should never be disconnected after setting up. Disconnecting and reconnecting IV lines increases the risk of introducing bacteria or other pathogens into the bloodstream, potentially leading to serious infections.
- Common complications to be aware of when a PICC is in situ are redness, pain and swelling in the arm, as these can indicate phlebitis, infection or thrombosis.

1.1 GRIP-LOK (adhesive securement devices)

- Grip-Loks are adhesive securement devices which can be used to hold the vascular access device in place either at the insertion site as a primary fixation device or as a secondary device to support longer lumens.
- Grip-Loks are primarily used in the Trust as a secondary securement device to support cuffed tunnelled catheter lumens in parenteral nutrition patients.

Grip-Lok applications



2. INSERTION SITE

- The right basilic vein is the 1st vessel of choice for PICC insertion, above the antecubital fossa below the axilla. This is the most direct, uncomplicated vessel route to the Superior Vena-Cava (SVC).
- The 2nd choice is the right brachial vein, although care should be taken to avoid arterial puncture as the brachial vein can be very close to the artery.
- The 3rd choice vessel is the cephalic vein; this is due to the complicated pathway the vessel takes to reach the SVC. A left sided approach in the same vessel order, basilic, brachial then cephalic, can be considered if the right side is not viable.

3. PICC SPECIFICATIONS

- The number of lumens used should be kept to a minimum to reduce complications.
- The PICCs used in the organisation are valved externally. This means they don't need a clamp to close the catheter.
- The valved PICCs in use in the organisation do not need heparinised sodium flushing to maintain patency. A good 10ml push pause flush of normal saline 0.9% is effective in reducing occlusions.
- The PICC configurations used in the organisation are single lumen 4Fr groshong PICCs and 5Fr double lumen and triple lumen Power PICC's.
- A 3Fr catheter is also available for paediatrics, which is power injectable but not valved and therefore has a clamp.

Lumens	Catheter Size	Lumen Gauge Size	Average Gravity Flow Rate	Priming Volumes
Single	4 Fr	18 Ga.	1,272 ml/hr	0.67 ml
Single	5 Fr	18 Ga.	1,185 ml/hr	0.66 ml
Dual	5 Fr	18 Ga. / 18 Ga.	578 ml/hr / 578 ml/hr	0.57 ml / 0.57 ml
Dual	6 Fr	18 Ga. / 18 Ga.	753 ml/hr / 753 ml/hr	0.62 ml / 0.62 ml
Triple	5 Fr	18 Ga. / 20 Ga. / 20 Ga.	982 ml/hr / 131 ml/hr / 131 ml/hr	0.76 ml / 0.43 ml / 0.43 ml
Triple	6 Fr	17 Ga. / 19 Ga. / 19 Ga.	1,163 ml/hr / 275 ml/hr / 275 ml/hr	0.76 ml / 0.47 ml / 0.47 ml

4. POWER INJECTION FOR CT AND MRI CONTRAST

- Power injectable means that CT contrast can be injected into the lumen of the catheter at high pressure.
- The catheter lumen hub will display the power injection capability on it; if this information is missing from the lumen it is NOT power injectable and should not be used.
- PORTs that are power injectable will have a CT identifiable symbol which is visible on an x-ray of the PORT.
- Only trained staff should use a vascular access device for power injection
- BD 4 Fr Groshong PICC's are not power injectable

Power Injection of CT contrast via a power PICC

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Are you sure the PICC is power injectable /compatible for power Injection? Check the following;

- PICC is Purple ✓
- PICC Hub states flow rate 5mls per second. ✓
- The clear lumen states Power Injectable. ✓

Following confirmation that the PICC is Power Injectable it can used to administer room temperature contrast up to 5mls per second via a CT injection pump. The following procedure should be used:

1. Ensure PICC hub is power injectable. (Check for 'No CT' symbol and '5mls per second' flow rate)
2. Remove needle free connector and clean hub
3. IMPORTANT! - if the PICC does not flush well do not use it. Position patients PICC arm to final scanning position and flush power injection hub with 10mls of normal saline.
4. Connect CT contrast directly to the power injectable hub
5. After the contrast injection manually flush the lumen with 10mls of normal saline
6. Replace new needle free connector to lumen. Flush all other lumens of the PICC with 10mls of normal saline

IMPORTANT!! If there is any doubt that the PICC lumen is power injectable do NOT use it for CT contrast injection.

For help or advice contact the IVAS team on bleep 651 or Ext 2668

Andrew Barton/Version 1/Oct 2016 ©

5. PICC POWER INJECTION SPECIFICATIONS

POWERPICC SOLO* CATHETER CONFIGURATION	LUMEN SIZE	USABLE LENGTH	POWER INJECTION FLOW RATE	MAXIMUM POWER INJECTOR PRESSURE SETTING	GRAVITY FLOW RATE (ml/hr)	PRIMING VOLUME (ml)
4 Fr. Single-Lumen	18	55 cm	5 ml/sec.	300 psi	1024	0.73
5 Fr. Single-Lumen	18	55 cm	5 ml/sec.	300 psi	978	0.73
5 Fr. Dual-Lumen	18/18	55 cm	5 ml/sec.	300 psi	498/498	0.65/0.65
6 Fr. Dual-Lumen	18/18	55 cm	5 ml/sec.	300 psi	740/740	0.75/0.75
6 Fr. Triple-Lumen						
RED LUMEN	17 Ga.	55 cm	5 ml/sec	300 psi	560	0.71
GREY LUMEN	19 Ga.	55 cm	N/A - No CT	N/A - No CT	308	0.57
WHITE LUMEN	19 Ga.	55 cm	N/A - No CT	N/A - No CT	308	0.57

6. REFERRAL FOR A PICC

PICC referrals can be made in the following ways:

- Electronic referral on Epic
 - Inpatient – Epic EPR order - inpatient consult to vascular access
 - Outpatients – Epic EPR order- Triage referral
- By Epic EPR inbasket referral – staff message system
 - P IVAS FPH Vascular ACCESS CLINICANS
 - P WPH VASCULAR ACCESS CLINICANS
 - P IVAS UNIT SPECIALITY BOOKINGS TEAM

Contact details visit [IVAS intranet Page](#)

- By internal telephone
- By mobile phone
- By bleep
- In all cases an electronic referral will need to be made for audit purposes. The patient's clinical team must make the referral and the patient's consultant must be in agreement. This must be documented by the clinical team in the patient's clinical records.
- In some cases, the Vascular Access specialist team may decide a PICC is inappropriate and offer an alternative; this will be discussed with the clinical team.
- Intravenous drug users are not permitted to have PICCs as they pose a significant risk to the patient if abused. The Vascular access team are available to support with IV access if this is required.
- PICCs requested just for taking blood will not routinely be placed as they often fail due to fibrin tail.
- Private patient referrals will be made by the consultant in charge of the patient's care to the interventional radiology consultants. If they are unable to place the PICC, the vascular access team will do so.

7. EQUIPMENT AND PROCEDURE

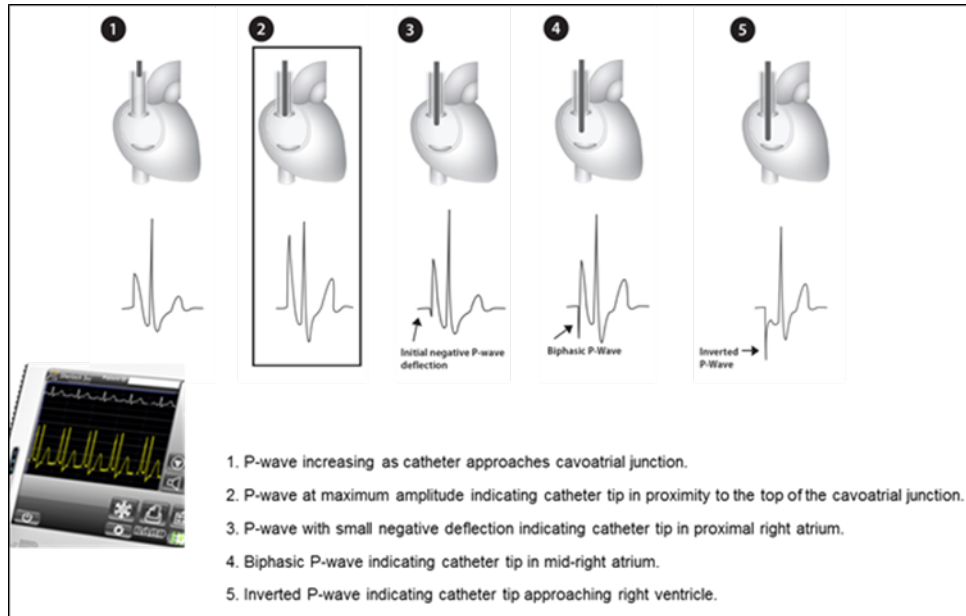
As with the central line, the clinician should use strict asepsis and maximal barrier precautions (e.g., large sterile drape and gown).

- Lignocaine 1% can be used to anaesthetise the area and administered by the vascular access specialist nurse under patient group direction PGD TW X020 Lidocaine for use in vascular access, available at <https://ourplace.xfph-tr.nhs.uk/patient-care/clinical-department-information-and-advice/pharmacy/patient-group-directions-pgds/>
- Ideally the patient will be required to be no higher than 40°, preferably fully supine where possible, with their shoulder and arm abducted from their body.
- PICC insertion is permitted by the vascular access team and interventional radiology. It is a competency-based activity.
- Ultrasound guidance must be used to access the vessel using a micro-introducer. This should only be attempted by those trained to use ultrasound and micro introducers.
- Once in situ an adhesive fixation device must be used to secure the line and dress with a clear permeable dressing. Suturing of PICCs is not permitted.
- The patient can be positioned as per personal preference and clinical need once the line is secured with a dressing, and the area is made safe for other practitioners.
- ECG and Tip navigation technology is used to place all PICCs in the Trust as this reduces the need for CXR and decreases the malposition rate. The exception to this is if the patient has an absent P wave in which case a chest x-ray must be used to verify tip placement, and this must be documented on the PICC insertion Proforma prior to use.
- Some patients will require PICC placement using fluoroscopy in interventional radiology and this will be undertaken by the interventional radiology team in line with their own protocols.

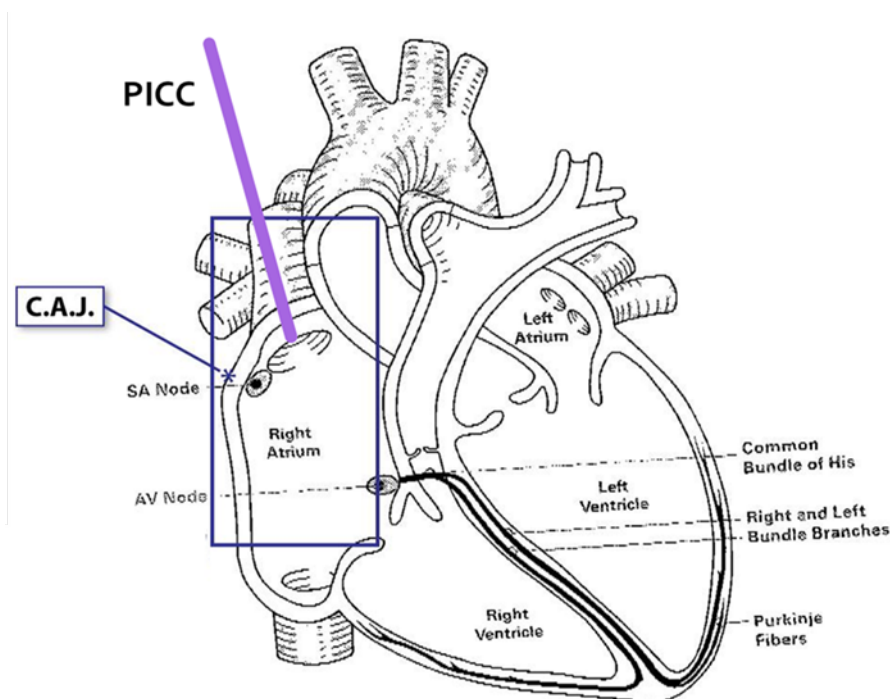
8. CONFIRMING PICC TIP LOCATION

- If ECG technology has been used to place the PICC, a printout of the ECG can be used to document and confirm TIP location; in this instance a chest x-ray is not indicated.
- The ECG technology uses the P wave of the cardiac cycle to identify how far into the SVC the PICC tip is. If a deflection is seen on the ECG monitor, this would indicate that the PICC has passed the SA node into the atrium. The PICC is then pulled back until the P wave is amplified with no deflection. This is then proof that the PICC tip is in the lower 3rd of the SVC or Cavo-Atrial junction and the PICC can be safely used. A printout of this ECG is then attached to the insertion notes to confirm placement.

- Confirming PICC tip placement with ECG requires the patient to have an identifiable P wave on the cardiac monitor. If the P wave is absent a chest x-ray will be required to confirm PICC tip placement prior to using the PICC.
- Patients in Atrial Fibrillation will require a chest x-ray to confirm PICC placement.



- In line with national guidance (NICE 2019) the PICC tip should be below the carina and at or above the cavo-atrial junction.
- If the patient has an absent 'P' wave on their ECG a chest x-ray will be required to confirm tip placement



9. PICC INSERTION DOCUMENTATION

← Back **PICC Single Lumen Basilic Right**

Hand Hygiene Completed

Is the patient at risk for Medical adhesive-related skin injuries (MARS)?

PICC

Length of internal measurement after device insertion (cm) Length of external measurement after device insertion (cm)

Location
☐ Brachial ☒ Basilic ☐ Cephalic ☐ Femoral ☐ Internal Jugular ☐ Subclavian ☐ Skin-tunneled
☐ Other (comment)

Orientation

Placement Verification
☐ ECG ☐ VPG ☐ Fluoroscopy ☐ X-ray

Safe to use

ECG scanned to notes

Site Prep
☐ Alcohol/Chlorhexidine ☐ Betadine ☐ Other (Comment)

Site prep agent has completely dried before insertion?

All 5 sterile barriers used (Gloves, Gown, Cap, Mask, Large Sterile Drape)?

Local Anaesthetic

Technique
☐ Anatomical landmarks ☐ Guidewire ☐ Transillumination ☐ Ultrasound guidance ☐ Other (Comment)

Inserted by

Insertion Attempt/s

Patient Tolerance

Difficult Venous Access

Securement Method
☐ Adhesive securement device ☐ Mechanical securement device ☐ Transparent dressing

Exit Site Protection

Dressing Type

Guide wire removed

All sharps accounted for

Guide wire & sharps disposal witness name

PICC insertion witness name (for those not certified)

Removal Date Removal Time

Earliest Known Removed

Removal Reason

Catheter damage	Leaking	Infiltrated	Occluded	Per order	Per patient/family ...	Per protocol
Removed by patient	Site change	VIP score 1 or more	Other (comment)			

Securement device removed intact

☐ Transparent IV film dressing ☐ Adhesive Securing device ☐ Mechanical Securing device ☐ Other (comment)

Removal Catheter Length (cm)

Catheter Tip Cultured

☐ Yes ☐ No

Properties Audit Trail (Location)

- A PICC insertion record must be completed and filled in the patient's record, if the PICC has been placed by interventional radiology a procedural note will be completed and a report generated.

For patients who are being discharged with the device, a PICC passport must be completed and sent with the patient. This will ensure that the community nurse is aware of insertion length. The PICC passport is also the patient information leaflet, contains the IVAS team contact details and acts as the PICC care bundle. Whenever a patient is coming into the organisation. The PICC passport can also be used to document CT scan power injection and removal of PICC. Once the device is removed this document should be scanned to the patient's Epic EPR record.

Safe. Cared for. Listened to.

Frimley Health NHS IVAS.

NHS Foundation Trust

Care of your Vascular Access Device

PICC Line

Peripheral Inserted Central Catheter

A guide for patients, carers and community nurses

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PICC insertion details

Procedure Date: Operator:

D/C Ward: Reason For PICC:

Allergies:

Make of PICC line : Bard SOLO Power PICC or other:

POWER INJECTABLE: Yes/No - 5ml/sec maximum contrast

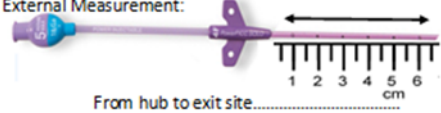
PICC Tip confirmed in the SVC with ECG ☐ Chest X-Ray ☐

Details:

Left arm / Right arm Vein Accessed:

Insertion Length: Securement device:

External Measurement:



Valved Catheter Yes/No Needle free connectors:

Flushing Regime:

Dressing Used:

Contact Numbers: Frimley IV TEAM HUB: 01276 522668

Lead Nurse: Andrew Barton- 07769673065

Frimley Home IV therapy: Fiona Nadine- 07467353691

Wexham IV TEAMHUB: 01753 634600

Wexham Vascular Access: Jo Graziano- 07920756619

Wexham Vascular Access: Chris Powers—07917070523

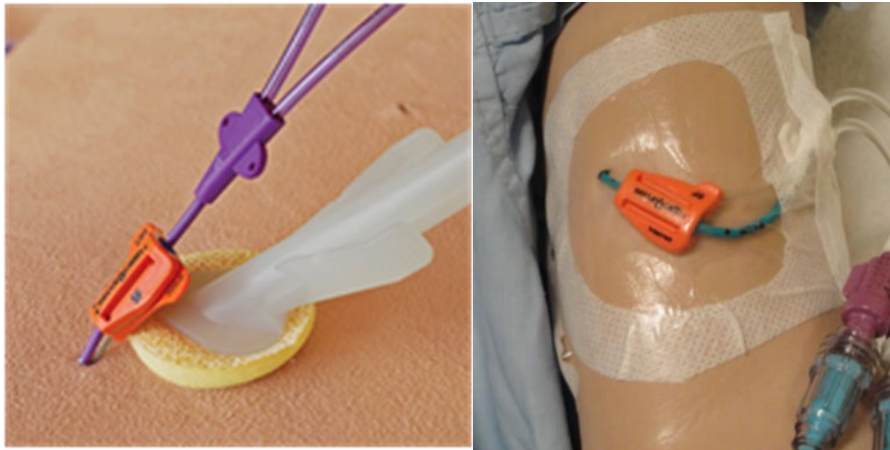
Wexham Home IV therapy: Hilary Hodgson- 01753 633000

10. TISSUE ADHESIVE (SKIN GLUE)

Tissue adhesive can be used to seal the catheter insertion site, this can reduce bleeding and the risk of infection entering the site. The use of tissue adhesive is not recommended as the primary catheter fixation method

11. SECURACATH®

SecurAcath® is a subcutaneous clip which remains in situ for the duration of the time the PICC indwells and hold it in place with very little chance of the PICC migrating. This type of device is contraindicated in those who are allergic to nickel.



1. Every 7 days when the IV film dressing is changed
2. The skin should be cleaned under the SecurAcath® and allowed to dry before the new dressing is applied
3. To remove the SecurAcath® please see removal diagram (section 15, below)
4. The PICC is removed before the SecurAcath®
5. Topical or local anaesthetic may be required for removal.

12. SECURACATH® REMOVAL




REMOVAL



- Grip the HOLD tab with thumb and finger of one hand to stabilize device
- Pry upward at edge of LIFT tab with the other hand to release cover from anchor base



- Completely detach cover from anchor base



- Remove the catheter – do not use excessive force
- Hold pressure at site to achieve hemostasis
- If the insertion site is "crusty" or scabbed, use sterile gauze and saline to soak the site for a few minutes. The tissue will soften and SecurA cath removal will be easier



- Use a blunt tip scissors (Mettzenbaum, Mayo or similar) to cut anchor base completely in half lengthwise along the groove



- Anchor base must be in two separate pieces



- Place one hand near the insertion site to stabilize the tissue
- Stretch the skin taut by holding pressure with your fingers on each side of the insertion site
- Use a swift, deliberate tug to remove each half of the anchor base separately
- The flexible anchor will straighten as it is pulled out and will not cause tearing or trauma to the tissue

24-Hour Clinical Information Line 1-800-225-0000

Go to www.securacath.com for more information

Please refer to Instructions for use for indications, contraindications, hazards, warnings, cautions and directions for use.

CE 0473

13. PICC CARE AND MAINTENANCE

- PICCs are central devices and should be handled with sterile ANTT when performing dressing change.
- Needle free connectors, film dressings and adhesive fixation device should be changed every 7 days or earlier if visibly soiled or damaged.
- The PICC is dressed with the film dressing – IV Advanced Tegaderm Film Dressing

An Epic EPR PICC assessment should be completed to record PICC care and maintenance 3 times a day (every 6 hours with the drug round). Data from assessment bundles can be used for audit purposes.



14. FLUSHING TECHNIQUE

- The use of flushing is aimed at confirming catheter patency
- ONLY A 10ml syringe or above should be used to access the catheter. A smaller syringe could damage the integrity or the catheter or dislodge the tip due to the higher intra-catheter pressure.
- PICCs should be flushed before and after use with a 10ml flush of Sodium Chloride 0.9%.
- The lumen should flush freely with no resistance. If resistance is felt, the flush should not be forced – DO NOT use a smaller syringe to unblock.
- If the PICC has multiple lumens, each lumen should be flushed with 10mls of sodium chloride 0.9%.
- Only registered healthcare professionals who have undertaken the IV course are permitted to flush central catheters.
- Heparinised sodium /saline locks are not required and are poorly evidenced in maintaining catheter patency.
- Some shared care patients such as nutritional support patients use Taurolock® between PICC usages.
- If the PICC is not in use daily a weekly flush of normal saline 0.9% should be prescribed and administered.

15. Epic EPR PICC LINE ASSESSMENT - LONG-TERM CVC CARE BUNDLE

[← Back](#) **PICC Single Lumen Basilic Right** [+ Assessment](#)

Assessment

Time taken: 22/1/2025 14:53 [Responsible](#) [Restore](#) [Create Note](#) [Macro Manager](#) ☐ Show Row Info ☒ Show Last Filled Value ☒ Show All Choices

Location: Basilic Orientation: Right

Macros: ▶ Normal Shift Assess...

Actions taken & justification for PICC line to remain

VIP Score

VIP Assessment

Securement Type

Dressing Status

Dressing Type

Exit Site Protection

Dressing Change Due

Needle free connectors present on all lumens?

Device lumens all flushing and patent?

Needle free connectors present on all lumens?

Device lumens all flushing and patent?

Needle free connectors replaced every 7 days or after 200 activations?

Needle free connectors cleaned before each use (2% Chlorhexidine wipe)?

ANTT followed?

Lumen label types

External measurement once per week - document measurement

IVI giving set attached to device

IVI giving set labelled with Date & Time

[Create Note](#)

[Accept](#) [Cancel](#)

Recent Assessments

Assessments

No assessment to display.

16. LONG-TERM CVC COMPLICATIONS

Complication	Definition	Symptoms	Prevention	Treatment
Phlebitis	Inflammation of either the intima or all 3 layers of the vein. Three types: Mechanical, Chemical & Bacterial.	Pain. Swelling Redness.	Avoid cannula insertion around bony prominences. Monitor pH of the drugs administered. Hand washing.	Remove cannula. Swab and monitor site. Send tip of for MC&S if above VIP score of 1.
Infection	The acute inflammation of the vein	Redness, Swelling, Exudate at the entry site. Palpable cord Pyrexia especially if associated with line flushing.	Hand cleaning. Aseptic or non-touch technique. Use of skin preparation. Minimise manipulation of system. Maintenance of closed system. Maintaining sterility of items.	Report Symptoms, MC&S swab exudates. Send catheter tip for MC&S <i>NB Rigors associated with flushing of line should be treated as an emergency</i>
Thrombosis	Formation of blood clot in the vein.	One sided dark swollen, mottled area in shoulder, neck or upper body area. Obvious Collateral veins on one side of upper body.	Warfarin therapy. The smaller the device the better.	Inform Vascular Access team, ultrasound the affected arm and leave PICC in situ. Commence low molecular weight heparin - discuss with Vascular team. PICC can be removed following expert guidance.
Mal position	By clinical evidence and imaging techniques.	Potentially none, other than imaging findings. Otherwise arrhythmias, pain or poor infusion.	Correct positioning of the patient and correct use of equipment and techniques.	Clinical manoeuvres. Semi- withdrawal and re-insertion (if sterile field still intact). Remove and further attempt with new line and/or site.
Splitting / reporting	Blood, line content evident around the line. On aspiration of line lack of pressure and air bubbles evident.		Avoid poor flush technique. Avoid using syringes less than 10 ml	Seek expert advice from interventional radiology or vascular access team prior to removing.
Blockage	Blockage or kinking of the line	Inability to administer sodium chloride 0.9% through the line.	Flush well before, between and after all drugs. Flush using the push-pause, positive pressure technique.	DO NOT use anything smaller than a 10ml syringe. See guidelines for persistent withdrawal occlusion (appendix 1).

			Flush device as per protocol if not in use.	
Medical adhesive-related skin injury (MARSI)	A skin lesion or blister that forms after the application of an adhesive product such as a dressing or adhesive securement device or skin stripping, skin tears, tension injuries or blisters after the removal of an adhesive dressing or securement device.	Redness Itching Pain Blisters Tissue breakdown at the corner edges of dressings, Dermatitis Folliculitis	Select the right adhesive product Prepare the Skin before application Ensure the tissue is dry Apply a topical barrier Use medical adhesive removers	Contact Vascular access for review and dressing advise
Failure to place	By clinical evidence and imaging techniques.	Failure to cannulate the vessel or ascend/descend the line to final destination.	Appropriate positioning of patient. Appropriate choice of line. Expert or supervised clinician. Utilisation of USS guidance. Alternative insertion site	Discuss with senior clinician, team and patient. Escalate to vascular access team.
Haematoma	Uncontrolled bleeding at vessel puncture site	Bleeding, swelling at insertion site	Release tourniquet at appropriate time, check clotting range and apply 2 to 3 mins pressure after removal	Apply pressure to haematoma site if new, elevate limb and inform clinical team. Consider Vascular Surgeon opinion is severe
Arterial Puncture	During insertion the needle transfixes the artery peripherally	Bleeding at insertion site, excessive bleeding via sheath during insertion, after insertion lines will be pulsatile and act against gravity	Where possible use ultrasound to insert catheter and/or avoid ACF and ensure vein is palpable and not pulsatile	Remove and apply at least 3mins of pressure, document and observe site for hematoma
Air Embolism	Air in the venous system	Cyanosis, tachypnea, dyspnea, coughing, tachycardia and hypotension.	Maintain closed system Use clamps on open-ended line. Remove air from all drugs prior to IV administration.	Close system to air (clamp) Treat as an emergency, call for help 2222 Report to clinician. Put patient in the left Trendelenberg position (head down). Administer oxygen therapy via a non-rebreath mask.

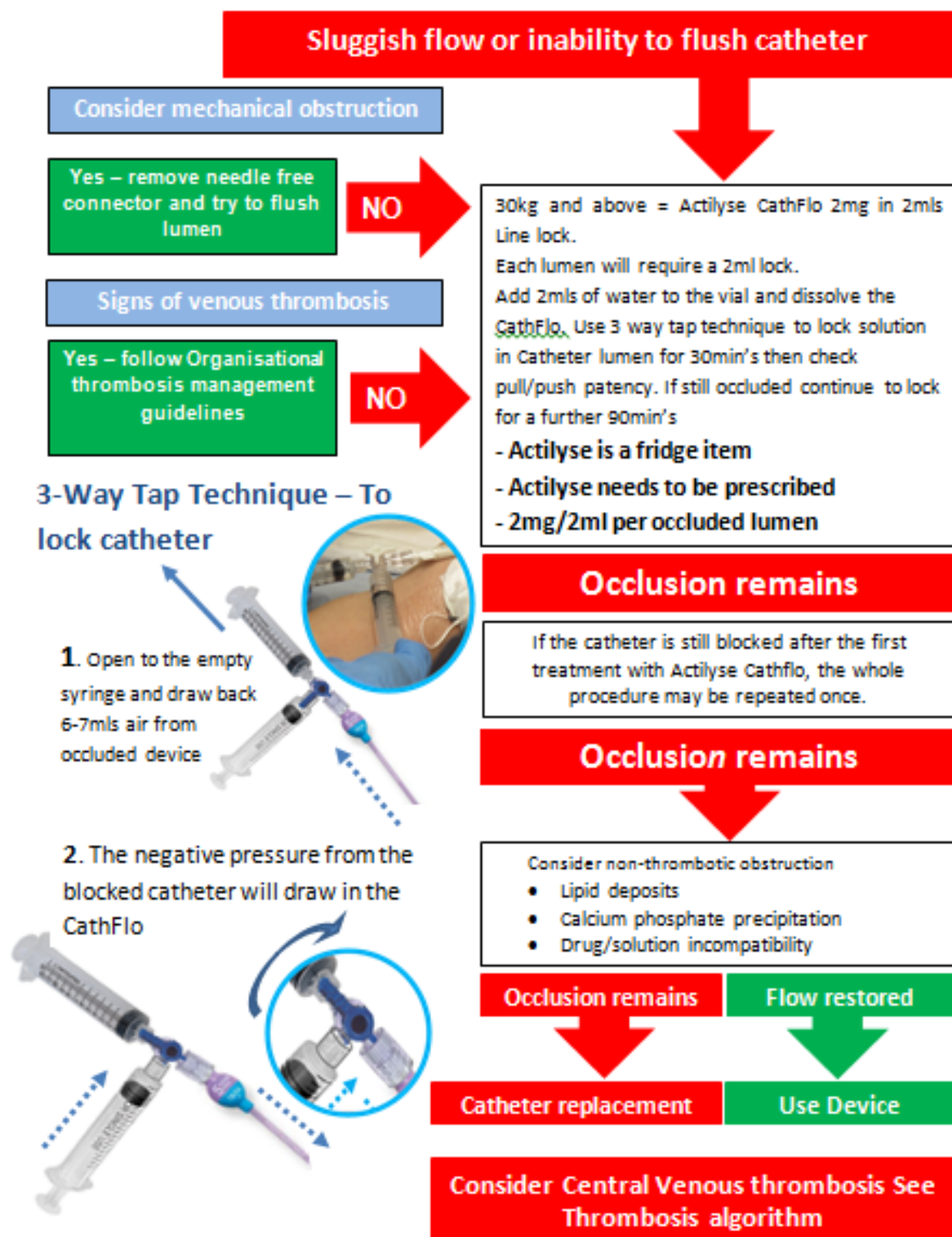
Pneumothorax and/or haemothorax (only in the first 24 hours)	Punctured lung is a complication of insertion.	Shortness of breath +/- pain in the first 24 hours after insertion of line.	Consider choice of site carefully. Ensure high level of expertise or supervised practice is applied in order to minimise risks. Give careful consideration to CPAP, IPPV and emphysematous patients. Consider coagulopathy and thrombolytic therapies.	Treat as an emergency Call for help 2222 Emergency chest x-ray. Report to clinician and consider the need for a chest drain. Put patient in the left Trendelenberg position (head down). Administer oxygen therapy if available.
Acute CVC Tip in artery – carotid/aorta	During insertion the needle transfixes the internal jugular into the carotid artery	Bleeding at insertion site, excessive bleeding via sheath during insertion, after insertion CVC lines will be pulsatile and act against gravity e.g. backflow of blood, pump alarming high pressure etc.	Ultrasound guided insertion of neck CVC is recommended and tip confirmation must be by chest x-ray and either CVP wave form transducer or venous blood gas unless placed with fluoroscopy.	Vascular surgeons should be urgently consulted prior to the line being removed because of the risk of stroke caused by carotid arterial thrombus and/or uncontrolled bleeding/hematomas at insertion site and at arterial puncture site through underlying structures in the neck.

	Assessment and intervention
Venous thrombosis	Signs of thrombosis: - swelling of the arm and neck, head or face, distended collateral circulation over chest wall - SVC thrombosis will have bilateral signs Arrange a venogram and initiate anti-thrombotic therapy (see catheter related central vein thrombosis algorithm) For cases where CrCl, calculated using the Cockcroft and Gault formula, should be used to determine renal dose adjustments, see <i>Important: dosage adjustment advice in the BNF</i>. In addition, the MHRA advises that CrCl should be used as an estimate of renal function for direct-acting oral anticoagulants (DOACs), and drugs with a narrow therapeutic index that are mainly renally excreted. If dose adjustment based on CrCl is important and no advice is provided in the relevant BNF drug monograph, prescribers should consult product literature. Renal function and drug dosing should be reassessed in situations where eGFR and/or CrCl change rapidly, such as in patients with AKI.
Stasis of blood in catheter	Aspiration from catheter may clear obstruction. Consider Heparinised saline or Alteplase
Kinked/clamped catheter	Straighten catheter Ensure all clamps are open Examine reinforcement sleeve for indentations & massage catheter between thumb and index finger to remove any kinks
Faulty needle free bung/connector	Remove connector/bung and reassess patency by flushing directly via catheter hub
Obstruction with catheter hub	Direct observation of inside of catheter hub If connection between hub and catheter obscured, consider ethanol or HCl administration into catheter hub (Table 4). Attempt aspiration and then flush catheter with 10ml 0.9% NaCl for injection
Catheter tip against vessel wall	Change patient's position (supine/upright or vice versa) Try the Val-salva manoeuvre and reassess patency
Catheter tip migration or malposition	Check notes and/or CXR for initial tip placement Perform repeat CXR to assess current tip position
"Pinch-off" syndrome (subclavian vein catheters only)	Check patient's notes for verification of venous access route. Assess if the occlusion is intermittent or positional (relieved by rolling shoulder forward or raising arm on ipsilateral side)

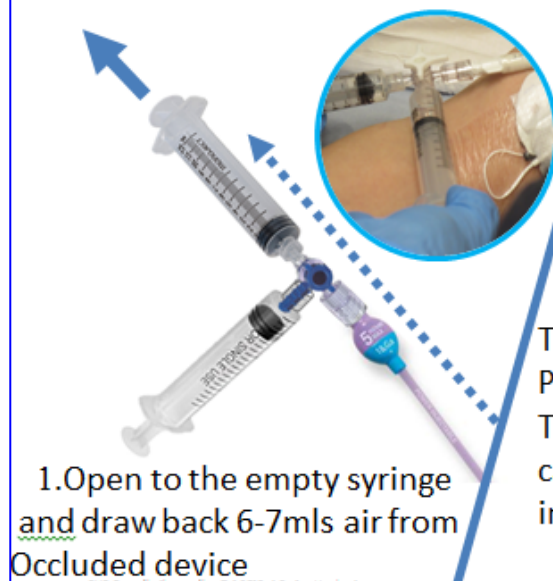
17. PHARMACEUTICAL INTERVENTIONS FOR A SUSPECTED OCCLUSION

Drug	Indication		
Alteplase (Actilyse CathFlo)	Suspected fibrin deposits	2mg in 2mls	1. Use 10ml luer-lock syringe and inject via hub of catheter using a push-pause motion 2. Monitor catheter closely for signs of “ballooning” or traumatic fracture 3. Initial dwell time is 30 minutes 4. Attempt aspiration, if the catheter is functional then withdraw the alteplase in line with the manufacturer's guidelines and flush catheter with 10mls 0.9% sodium chloride 5. If the catheter is not functional after a dwell time of 120 minutes assess the catheter functionality again 6. Repeat once if initial dose not successful a second equal dose of equal amount may be instilled.

6. Central venous catheter occlusion protocol



3-Way Tap Technique



The negative Pressure from The blocked catheter will draw in the CathFlo



Full version control record

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Lead Director / Chief of Service:	Chief of Nursing and Midwifery: Melanie van Limbogh Interventional Radiology CoS: Dr Andrew Hatrick
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This guideline has been registered with the trust. However, clinical guidelines are guidelines only. The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician. If in doubt, contact a senior colleague or expert. Caution is advised when using guidelines after the review date.

This guideline is for use in Frimley Health Trust hospitals only. Any use outside this location will not be supported by the Trust and will be at the risk of the individual using it.

Version History

Version	Date	Guideline Lead(s)	Status	Comment
1	03/04/17	Advanced Nurse Practitioner Vascular Access	Final	
2	05.11.2019	Advanced Nurse Practitioner Vascular Access	Final	Ratified at NMB
3	March 2025	IV therapy and Vascular Access Organisational Lead	Final	Scheduled review

Related Documents

Document Type	Document Name
Guideline	Part 1 Introduction and Fundamental Principles of Practice
Guideline	Part 2 Vascular access LocSSIP
Guideline	Part 3 Peripheral Cannulation
Guideline	Part 4 Venepuncture
Guideline	Part 5 Midline IV Catheters
Guideline	Part 7 Short Term Non-Tunnelled CVCs
Guideline	Part 8 Implanted Ports and Tunnelled Cuffed CVCs
Guideline	Part 9 Arterial Catheters and Blood Sampling
Guideline	Part 10 Administration of Injectable Medicines
Guideline	Part 11 Infiltration and Extravasation
Guideline	Part 12 Long-term CVC Complications
Guideline	Procedural Sedation and Analgesia
Guideline	FHFT IPC Manual
Guideline	RCN Infusion Standards
Guideline	INS Infusion Standards
Guidance	Epic