

Intravenous and Vascular Access Services guidelines

Part 3: Peripheral Cannula - Insertion, Care and Maintenance

Key Points

- Peripheral vascular access is defined by the location of the catheter tip, which should be sited below the antecubital fossa.
- Peripheral cannulation poses a risk if guidance is not followed in the care and maintenance of this device.
- Care should be taken to ensure that IV therapy classed as vesicant, or irritants with a pH outside of 5-9 are not administered via a peripheral vascular access device

Version: 7.0

Date Issued: 20/05/2025

Review Date: 01/03/2028

Key words: Vascular access, peripheral cannula, difficult IV access,

This is a controlled document. If you are using a printed copy, check it against the guidelines site to ensure you are using the latest edition.

Print copies must be destroyed after use.

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 for Invasive Procedures
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
VIP Score	Visual Infusion Phlebitis Score

Contents

1. Peripheral Vascular Access Devices	3
2. Insertion Site	3
3. Types of Peripheral Cannula	4
4. Peripheral Cannulation Technique	7
5. Insertion Documentation	8
6. Flushing the cannula	8
7. Dressing the cannula	9
8. Cannula Maintenance	9
9. Cannula Care Bundles (Adult and Paediatric)	9
10. Difficult Peripheral Cannulation.....	9
11. Removal of Peripheral Cannulation.....	10
12. Visual Infusion Phlebitis (VIP) Assessment for peripheral cannula	10
Full version control record	11

1. PERIPHERAL VASCULAR ACCESS DEVICES

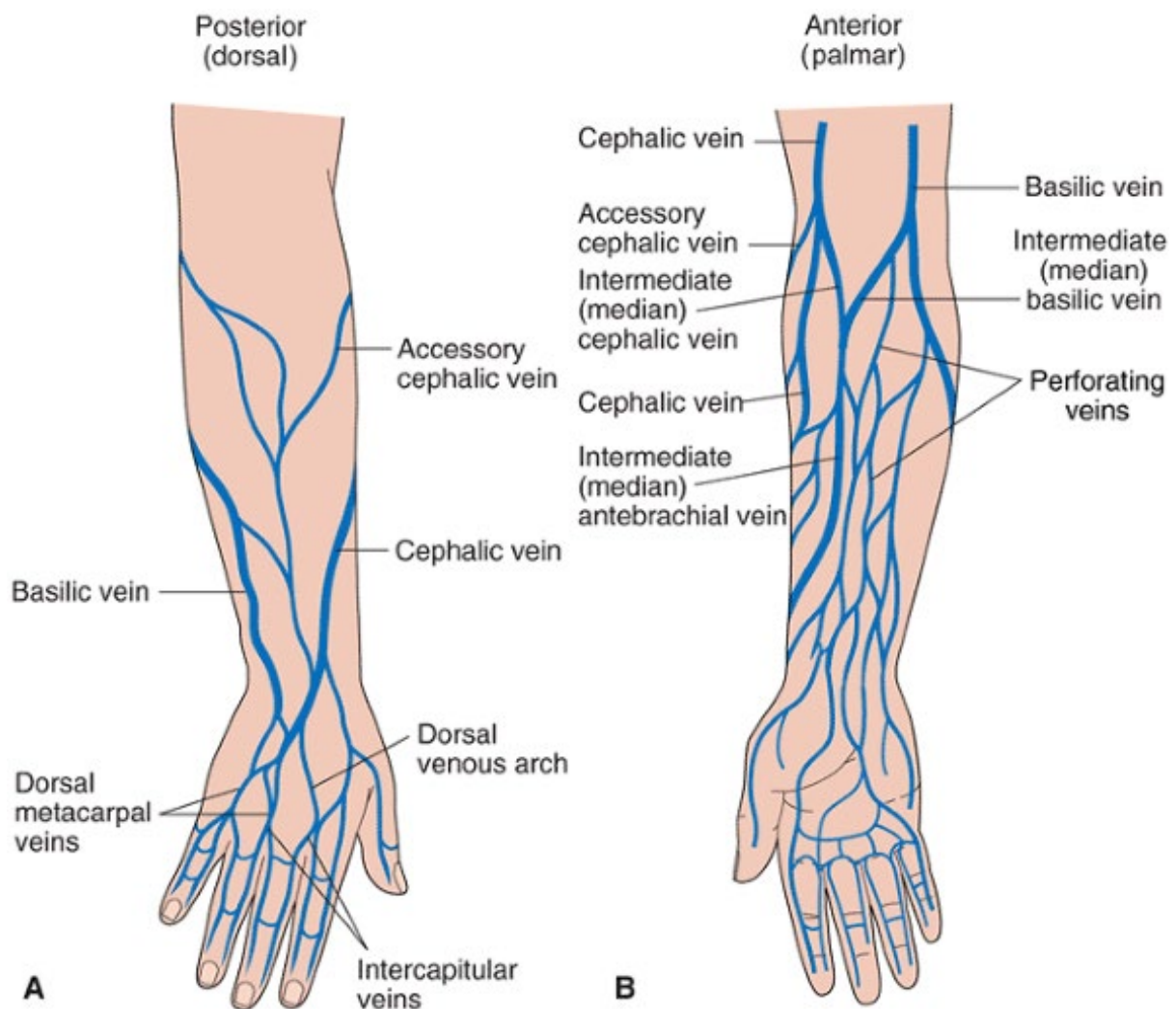
- Closed system safety peripheral cannula
- Midline Catheter
- Introcan Deep Access Midline Catheter
- PowerGlide Midline Catheter

Peripheral vascular access is defined by the location of the catheter tip which should be sited before the axillary vein in the upper arm. Care should be taken to ensure that IV therapy classed as vesicant, or irritants are not administered via a peripheral vascular access device.

A peripheral cannula is a short catheter and should not be cited above the antecubital fossa. IV therapy with a pH between 5 to 9; with a maximum osmolality up to 600 mOsm/L is considered suitable to administer through a peripheral vascular access device (see IVAS guidelines [part 11 Infiltration and Extravasation](#)).

2. INSERTION SITE

Feet and lower extremities, breasts, necks etc. are NOT recognised as safe peripheral cannulation sites and not allowed.



3. TYPES OF PERIPHERAL CANNULA

A peripheral cannula is a flexible polyurethane tube containing a needle (stylet), which may be inserted into a vein in the hand or lower arm. Cannulas are usually placed in the peripheral veins in the lower arm, starting with the distal aspect first. In Adult patient there are 2 types of peripheral cannula used in Trust.

The safest and most used peripheral cannula for adults in the Trust is a closed system sharp safe device called Nexiva. These cannulas are sharp safe and because they are closed systems, there is a very low risk of encountering the patient's blood. The safety needle mechanism is activated by the practitioner when required.



Nexiva 24g



Nexiva 20g



ProSafety 18g

Features of the Nexiva closed system safety cannula



BD Diffusics cannulas for CT contrast. This cannula can be used for smaller gauges for CT contrast injected at high rates. See chart below. The maximum flow rate is printed on the catheter hub. These devices are stocked by the Ct scanning centre and the vascular access team cross site.



BD Diffusics Peripheral cannula for CT and MRI					
Colour	Gauge	Length	Extension tube ID	Gravity Flow Rate	Max CT Flow Rate†
Yellow	24	0.75 in	1.22 mm	1235 mL/hr	3.0 mL/sec
Blue	22	1.00 in	1.65 mm	2690 mL/hr	6.5 mL/sec
Pink	20	1.00 in	1.65 mm	4050 mL/hr	10.0 mL/sec
Pink	20	1.25 in	1.65 mm	3850 mL/hr	10.0 mL/sec
Green	18	1.25 in	1.65 mm	3850 mL/hr	15.0 mL/sec

The other type of peripheral cannula used in the Trust is a Ported, open ended safety cannula which are used in theatres, maternity, ED Resus and some level one clinical areas. These cannulas are also stocked on the emergency trolleys throughout the Trust. These cannulas are used as they have a top port that makes it easier for anaesthetists to administer drugs rapidly. The top port represents an additional infection risk because it contains dead space that is hard to decontaminate. For this reason, a ported cannula should not remain in situ for more than 24hrs, it should be changed to a closed system cannula as early as possible when a top port is no longer required.

1. Closed system non-ported safety cannulas are the safest device to protect the operator from sharps injuries and exposure to blood.
2. Wherever possible, the operator undertaking peripheral cannulation should use a closed system non-ported safety device.
3. The three types of cannulas used in the Trust can be used for short term IV therapy of up to 96 hours if the VIP score remains 0.
4. The smallest gauge size cannula for the required fluid replacement should be selected and placed in the largest vein as far down the arm as possible. Joints and points of flexion at the wrist and ACF should be the last resort for placement location.
5. All non-vesicant IV therapy can be administered via the smallest cannula in the largest vein as far down the arm as possible unless high flowrates are required such as in CT contrast administration or large volumes of fluid are required to be administered rapidly. In these cases, a larger gauge cannula in the ACF may be required.
6. 24gauge/22gauge peripheral cannula should be the most routine cannula used for most IV therapy administration. The smallest gauges allow a turbulent blood flow around the indwelling cannula and reduce the risk of micro movements of the tip aggravating the tunica intima. This will avoid phlebitis and increase the indwell life of the cannula up to 96 hours.
7. The flow rate of a yellow 24 gauge cannula is between 500ml and 700mls depending on the infusion, this is adequate for most routine IV infusions.
8. Lower extremities and neck veins are only to be used in extreme life-threatening emergencies undertaken by experts and replaced the same day with a safe alternative vascular access device.
9. Routine cannulation in feet is prohibited.

10. During insertion of cannula strict aseptic technique should be adopted until the practitioner is skilled enough to use an aseptic non-touch technique (ANTT). This means if vein requires palpation after the skin has been decontaminated a sterile glove must be worn for the palpation.
11. 1ml or 1.5ml Chloraprep application must be used to clean and prepared the skin prior to cannulation, an area larger than the film dressing should be cleaned for 30 seconds and allowed to dry before the procedure as outlined in part 1 of the guideline.
12. A Cannula must only be inserted if there is a clinical necessity. They must never be inserted or left in situ "Just in Case" they are required.
13. Cannula should be inserted by a trained competent healthcare professional.
14. Only non-vesicant IV therapy should be administered via a peripheral cannula with a pH range of between 5 to 9 and osmolarity below 600 mOsm/L.
15. Sedation is not recommended for peripheral cannulation, in certain circumstances local or topical anaesthetic can be used to assist with the procedure. Cold spray does not need to be prescribed but topical anaesthetic cream does.
16. Injection of local anaesthetic is restricted to the Vascular Access team or clinicians.
17. A tourniquet must be used and not substituted with other apparatus such as gloves or human hands.
18. A prefilled sodium chloride 0.9% 10ml syringe flush is a medical device and can be used without prescription by all grades of staff.
19. Cannulas are single use devices and only inserted into the skin once. failed cannulation attempts require a new cannula for the second attempt.
20. Cannula placed by ambulance crews or other hospitals should be removed and replaced as soon as possible.
21. Peripheral cannula should never be sited towards the extremities, they should always be inserted in the vein towards venous blood flow towards the heart.

A Guide to Choosing the Correct Cannula for your Patient					
		Approximate Flow Rates (l/hr)			
Colour	Common Applications	Size Gauge	Crystalloid	Plasma	Blood
Orange	Used in theatres or emergency for rapid transfusion of blood or viscous fluids	14G	16.2	14.2	12.9
Grey	Used in theatres or emergency for rapid transfusion of blood or viscous fluids	16G	14.1	10.9	10.0
Green	Blood transfusions, parenteral nutrition, stem cell harvesting and cell separation, large volume of fluids	18G	6.1	5.2	3.8
Pink	Blood transfusions, large volumes of fluids	20G	4.0	2.7	2.5
Blue	Blood transfusions, most medications and fluids	22G	2.5	1.6	1.4
Yellow	Medications, short term infusions, fragile veins, children	24G	0.8	0.7	0.5

4. PERIPHERAL CANNULATION TECHNIQUE

Because inserting a peripheral cannula involves the risk of contact with the patients' bodily fluids the practitioner should not only wash their hands prior to the procedure, they should also wear clean gloves to protect themselves.

Action	Rationale
Prepare the environment.	To ensure that it is safe and comfortable for the procedure.
Explain procedure to patient and obtain verbal consent.	To ensure that the patient understands the procedure and gives his/her valid consent.
Collect all the required equipment including sharps bin.	So that the procedure has no unnecessary interruptions.
Position the patient comfortably, supporting his/her arm if needed with a pillow.	To ensure patients comfort and ease of assess.
Apply a tourniquet to the upper limb, to assess vein availability and then release.	To establish a suitable vein to access.
Prepare sterile field.	To minimise infection via insertion.
Re- apply the tourniquet.	To engorge the vein with blood.
Wash hands thoroughly or use alcohol hand gel and put on clean gloves.	To comply with Infection Control and maintain asepsis throughout.
Clean skin with 1ml or 1.5ml Chlorhexidine 2% alcohol 70% (e.g., Chloraprep Frepp) using the crosshatch technique and allow to air dry. Clean enough area around the proposed site to fit the cannula dressing for 30 seconds.	To maintain asepsis and remove skin flora, including the area under the transparent dressing.
Do not re-palpate the skin (ANTT). if re-palpation of the cannulation site is required after skin decontamination don sterile gloves.	Re-palpating may contaminate the area that has been previously cleaned.
If you need to re-palpate the vessel after decontamination, wear sterile gloves	
Holding the cannula at a 10°-45° angle to the skin, with the bevel up insert the cannula through the skin.	To ensure safe, successful cannulation and confirm the catheter is correctly positioned.
Withdraw the stylet needle slightly.	To observe for a second flashback and confirm access. The stylet should never be re inserted as this could cause a cannula embolism.
Do not re-insert the needle into the cannula if the flashback fails and do not reinsert the cannula into the skin if cannulation fails on the first attempt. The reintroduced needle can shear of the cannula causing a cannula embolism.	
Insert the cannula fully into the vein and pull the needle out, ensuring the safety mechanism engages	To maintain sharp safety.
Release the tourniquet.	To decrease blood spillage.
Dispose of the needle stylet in the sharps bin at the bedside.	To minimise the risk of needle stick injury.
Ensure needle free connectors are attached to the cannula hub.	To maintain a closed system

Flush the cannula with 10ml of 0.9% sodium chloride in a 10ml syringe using push pause positive pressure technique.	To ensure patency. Using smaller than a 10ml syringe can pose the risk of a cannula embolism.
Secure the cannula with a sterile semi permeable transparent dressing. The dressing should allow viewing of the entry site whilst stabilising the cannula. Record the date of the cannula on the dressing.	To allow regular Visual Infusion Phlebitis (VIP) scoring.
Record the cannulation in the cannula LDA on Epic	Good documentation is the skill of a safe practitioner.

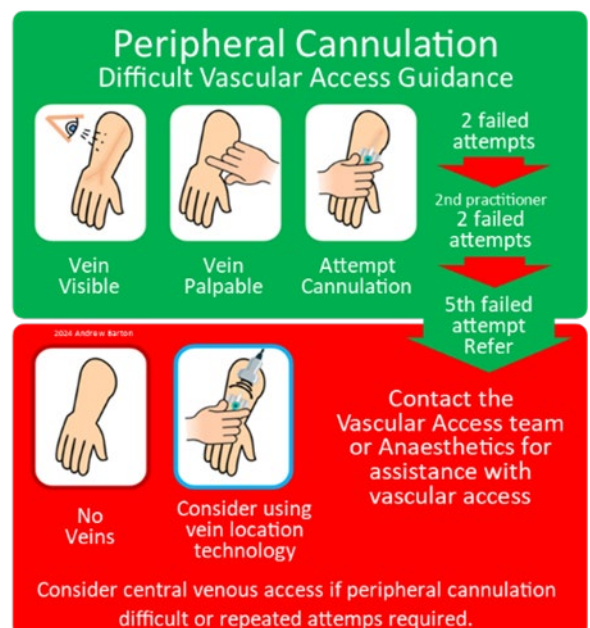
5. INSERTION DOCUMENTATION

1. All peripheral cannulas should be documented on the Epic LDA Avatar Adults and children.
2. All fields of the insertion proforma should be completed.

6. FLUSHING THE CANNULA

Peripheral cannulas should be flushed every 6 hours when the care bundle and VIP assessment is undertaken. Flushing the catheter regularly will increase the length of patency and reduce the risk of complications.

1. The flush should be a 10ml slush of 0.9% sodium chloride.
2. Where possible use a prefilled sodium chloride 0/9% flush.
3. The date of the saline flush should be checked by another nurse.
4. Use the push pause positive pressure technique to flush.
5. Only 10ml or above syringes should be used.
6. Pre-filled 10ml 0.9% sodium chloride flushes are medical devices and can be used without prescription by competent staff for flushing cannulas.
7. If the cannula does not flush, is painful when flushing or there are other complications during flushing remove the cannula at once and document.



7. DRESSING THE CANNULA

1. A semipermeable single film, IV dressing should be used to cover the insertion point of the cannula.
2. It is important dressings remain clean and dry; they should be changed if they are loose, dirty or have fluid collecting under them.
3. The dressing should be dated with the insertion date of the cannula, if the dressing is changed the insertion date of the cannula should be documented on the new film dressing.

8. CANNULA MAINTENANCE

1. Maintenance of the cannula should be documented on the Epic LDA Avatar peripheral cannula care plan. This care plan will encourage staff to monitor the cannula site on a shift basis every 6 hours and document a Visual Infusion Phlebitis (VIP) score which should be 0.
2. A VIP score of 1 or more should trigger removal of the device.
3. The film dressing should be clean and unsoiled. If the dressing is soiled it must be replaced and the new dressing dated with the expiry of the peripheral cannula.
4. Peripheral Cannulas must be removed at 96 hours or sooner if clinically indicated, even if no sign of infection.
5. Care and maintenance should be documented on the Epic LDA avatar every 6 hours, on the early, late and night shift, Epic EPR is set to alert staff to complete these tasks.

9. CANNULA CARE BUNDLES (ADULT AND PAEDIATRIC)

1. Every peripheral cannula inserted should be correctly documented on the Epic LDA.
2. The care bundle must be completed every shift, or at the same time as the drug round, this means approximately every 6 hours.
3. The care bundle must be completed by a registered nurse.
4. Any signs of phlebitis (VIP) of 1 or more and the device must be removed and re-sited, an incident form completed, and the clinical team informed. The phlebitis site must be monitored and documented daily and covered with a film dressing.
5. Once the care bundle is completed the cannula must be removed as this indicates that 4 days of care has occurred, and peripheral cannula cannot be left in situ after 96 hours.
6. If the cannula is no longer required, it must be removed, and this documented on the Epic LDA.

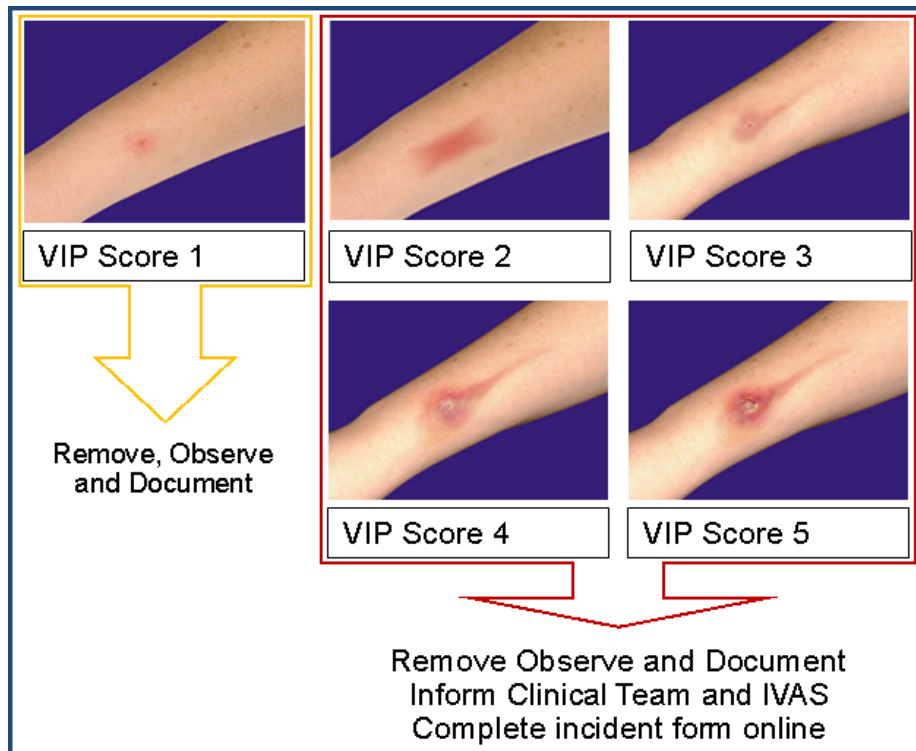
10. DIFFICULT PERIPHERAL CANNULATION

1. Patients who have difficult IV access are at higher risk of complications including extravasation and infiltration and catheter related infections.
2. Multiple cannulation attempts are painful and distressing for the patient. staff are only permitted to have a total of 4 attempts in total by 2 practitioners (2 per practitioner) before the patient is referred to the vascular access team.
3. If the patient is already known to be a difficult IV access patient no attempts should be made at peripheral cannulation, a direct referral to the vascular access team should be made via Epic and/or via the telephone or bleep system.

11. REMOVAL OF PERIPHERAL CANNULATION

1. Removal of peripheral cannula should be undertaken under the supervision of a trained nurse, if the nurse delegates this to an HCA the nurse is still accountable for any complication that occurs such as a post removal haematoma.
2. After the cannula is removed pressure should be applied to the cannulation site for at least 2 mins.
3. The site should be covered by a sterile waterproof dressing or plaster to prevent any exit site infection.
4. The removal should be documented on the Epic LDA

12. VISUAL INFUSION PHLEBITIS (VIP) ASSESSMENT FOR PERIPHERAL CANNULA



Full version control record

Version:	7.0
Guidelines Lead(s):	Andrew Barton, IV Therapy and Vascular Access Organisational Lead Melanie van Limborgh, Chief of Nursing and Midwifery
Contributor(s):	Dr Andrew Hatrick, Interventional Radiology Chief of Service
Lead Director / Chief of Service:	Dr Andrew Hatrick, Interventional Radiology Chief of Service
Library check completed:	N/A
Ratified at:	IVAS CG meeting 27/03/2025
Date Issued:	20/05/2025
Review Date:	01/03/2028
Pharmaceutical dosing advice and formulary compliance checked by:	Georgina Brown, 30/03/2025
Key words:	Vascular access, peripheral cannula, PICC, midline, difficult IV access, complications

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
5	03/04/17	Advanced Nurse Practitioner Vascular Access	Final	
6	05/11/2019	Andrew Barton Nurse Consultant	Final	Ratified at NMB
7	27/03/25	Andrew Barton Nurse Consultant	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 4 Venepuncture
Guideline	Part 5 Midline IV Catheters
Guideline	Part 6 PICCs
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
	Parts 1-12 available at https://guidelines.fhft.nhs.uk/
Guideline	Procedural Sedation and Analgesia guideline
Guideline	FHFT IPC Manual https://guidelines.fhft.nhs.uk/
Guideline	INS Infusion Standards
Guidance	Epic