

Cross Site Vascular Access and IV Therapy Clinical Guidelines: Part 5: Midline IV Catheters

Key Points

- Midline IV catheters are used for short term IV therapy and are peripheral devices.
- They are used for home IV therapy and acute short-term IV therapy of non-vesicants.

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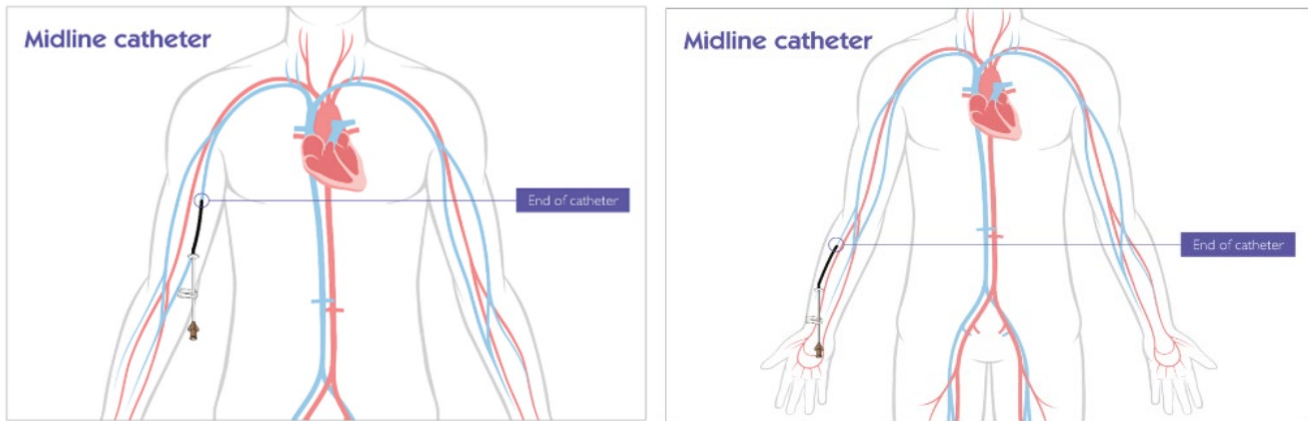
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Abbreviations

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
TIIVP	Totally implanted Intravenous Port
TPN	Total Parenteral Nutrition
VA	Vascular Access
VAD	Vascular Access Device
VasCath	Vascular Catheter

1. Midline Catheters



A midline is a small diameter catheter between 8cm and 20cm long. It can be placed above or below the ante-cubital fossa and the catheter tip never passes the axilla and therefore a midline is classed as a peripheral catheter.

1. The midline can remain in situ for up to 6 weeks if still required. A deep access short midline can stay in situ for up to 29 days if clinically required. In both cases the device should be removed at the first sign of phlebitis; pain redness or swelling.
2. Midline catheters should only be used to administer intravenous drugs which are non-vesicants with a pH range between 5 to 9 and an osmolality below 600. This drug information can be found in the pharmacy guide on the intranet site or using Medusa – NHS Injectable Medicines Guide which can be located via the MAR in Epic.
3. It is sometimes possible to obtain regular blood samples from midlines, but this can be unreliable and should not be relied upon.
4. PICC lines should never be pulled back or cut down to be used as midlines in the event of PICC migration or a failed attempt to place a PICC tip in the SVC.
5. The tip of the midline should not cross a point of flexion in the vessel.
6. Midlines can be used in all clinical areas or for home IV therapy administration.
7. Some clinical areas such as IVAS, ambulatory care and HIMS have members of their teams who are competent to insert midline catheters.
8. Where possible, ultrasound should be used to insert Plan 1-HealthMID Pressure Injectable midline catheters.
9. The documentation of the midline catheter should be completed in the patient's electronic record on Epic on the LDA avatar.
10. The Midline Passport is given to the patient on discharge with the midline catheter. It provides information for the patient and is a record of care and maintenance of the device. Once treatment is completed and the device has been removed, this document should be scanned into the Epic EPR patient record.

11. Types of Midline catheters (NOT FOR VESICANT IV THERAPY):

Short midline (6cm – 8cm)

BBraun Introcan Deep Access or BD PowerGlide

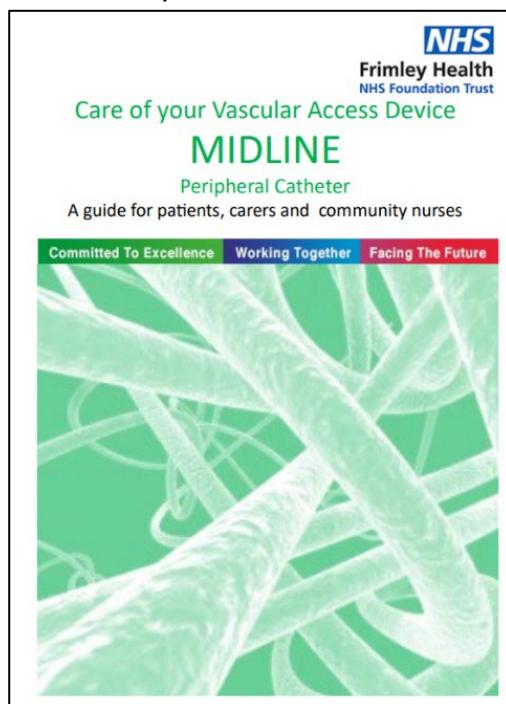
- **18g, 20g, 22g**
- Below or above the antecubital fossa
- Acute IV access or HIMS IV access
- Indwell for 29 days with VIP 0
- Power Injectable
- Safe for Infusions and bolus administration
- Blood draw possible

Standard midline (15cm to 20cm) Plan 1 health Midline

- **3fr, 4fr, 5fr**
- Below or above the antecubital fossa
- HIMS IV access
- Open ended (Health Mid)
- Health Mid is placed with Ultrasound, MST, wire, needle and splittable sheath
- Indwell up to 6 weeks with VIP 0
- Can be Power Injectable
- Safe for Infusions and bolus administration
- Blood draw possible from the 4fr, 5fr catheter

2. MIDLINE Passport for outpatients

1. Patients being discharged with a midline should have a midline passport completed so that the community team can record the care and maintenance.
2. The midline passport also gives patients information about the midline and who to contact if a complication should arise.



MIDLINE insertion details	
Procedure Date:	Operator:
D/C Ward:	Reason For MIDLINE:
Allergies:	
Make of MIDLINE : Bard Groshong / PowerGlide or other:	
POWER INJECTABLE: Yes/No - 5ml/sec maximum contrast	
Midline catheter is Peripheral and only suitable for IV therapy that has a pH of 5-9. Midline catheters are NOT suitable for IV vesicant administration.	
 PowerGlide—No external measurement	
Left arm / Right arm	Vein Accessed:
Insertion Length:	Securement device:
External Measurement:	
 Groshong	
From hub to exit site.....	
Valved Catheter Yes/No	Needle free connectors:
Flushing Regime: 10mls saline pre and post and weekly	
Dressing Used:	
Contact Numbers: Frimley Health IV TEAM HUB: 01276 522668	
Lead Nurse: Andrew Barton- 07769673065	
Frimley Vascular Access—Angela Dennison - 07393247071	
Frimley Home IV therapy: Fiona Nadine- 07467353691	
Wexham IV team Hub: 03006151136	
Wexham Vascular Access: Marco Nacarlo—07584443196	
Wexham Vascular Access: Chris Powers—07917070523	

3. Midline Insertion

1. Midlines are inserted by the cross site vascular access team.
2. A surgical ANTT is used to place the device.
3. Ultrasound is used to place the midline into the vessel with the least amount of trauma.
4. A sterile USS probe cover must be used.
5. The skin should be decontaminated with a minimum of 3mls of chlorhexidine 2% and alcohol 70% (Chloraprep)
6. After insertion there may be some bleeding that can be controlled with tissue adhesive at the exit site of the catheter.
7. A GripLok should be used to secure the catheter. If required a short cannula/needle free connector extension can be added to the midline.
8. Needle free connectors should be applied once the catheter has been inserted.

4. Flushing the Midline IV Catheter

1. A 10ml flush of 0.9% sodium chloride should be used per and post IV therapy administration and during care and maintenance to confirm midline patency.
2. The date of the saline flush should be checked by another nurse.
3. Use the push pause positive pressure technique to flush.
4. Only 10ml or above syringes should be used.
5. Pre-filled 10ml normal saline flushes are in clinical areas for use by non-IV therapy givers only for flushing on insertion
6. All infusions should be administered using a pump.

5. Securing the Midline Catheter



6. Dressing the Midline Catheter

1. A semi-permeable single film, IV dressing such as the Tegaderm IV advanced 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.

7. Care and Maintenance

1. Maintenance of the Midline should be achieved through following guidance on the Epic EPR LDA Avatar or flowsheet in the patients Epic EPR record. This care plan will encourage staff to monitor the midline site on a shift basis and document a Visual Infusion Phlebitis (VIP) score. This should be completed a minimum of 3 x daily. If an infusion is running for more than 30 minutes, documentation of 1 hourly VIP is required in the Epic EPR flowsheet.
2. For patients who are discharged into the community, a Midline passport should be sent out with them and a referral to the community nursing team made for flushing, care and maintenance weekly (every 7 days).
3. Attempts to unblock an occluded Midline should be avoided. An occluded midline should be removed.

8 Midline removal

1. Midlines should be removed using an ANTT.
2. Pressure should be applied to the exit site for at least 2 minutes and until any bleeding has stopped.
3. The catheter exit site should be covered with a waterproof film dressing to avoid exit site infection.

9. Midline Catheter Complications

Complication	Device	Definition	Symptoms	Prevention	Treatment
Phlebitis	All	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	All	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 NB Rigors associated with flushing of line should be treated as an emergency
Anaphylaxis	All	An allergic type reaction most commonly precipitated by the injection of a foreign substance.	Rash. Redness. Shortness of breath. Itchiness.	Check allergy bands.	Dependant on the severity. If life threatening call for help and give IM adrenaline 1:1000 - 500microgram IM injection – Follow UK Resuscitation council guidelines
Speed shock	All	The rapid administration of IV therapy.	Facial flushing Dizziness. Headache.	Administer medication/fluid at the recommended speed.	Call for help Inform clinical team ABCDE Assessment.
Infiltration	ALL	The inadvertent administration of a non-vesicant solution into the surrounding tissues.	Pain, redness swelling of the limb	Flush device to confirm patency and use pump check list to monitor infusions hourly.	

Extravasation (See Specific guidelines)	ALL	The inadvertent administration of a vesicant solution into the surrounding tissues.	Pain, redness swelling of the limb	Flush device to confirm patency and use pump check list to monitor infusions hourly. Give vesicants via a CVC	Treatment should be dependent on the pharmaceutical manufacturer's guidelines, the properties of the extravasated agent and the severity of the extravasation.
Thrombosis	All	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 heparinised sodium - discuss with Vascular team. PICC can be removed following expert guidance.
Mal position	All	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	All	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 mls	Seek expert advice from interventional radiology or vascular access team prior to removing
Exit site leakage	ALL	Fluid leaking from catheter exit site	Wetness under dressing is caused by fibrin sheath. Fluid is administered into the catheter and carried to the exit site on the outside of the catheter by the fibrin sheath. Catheter should be removed and replaced.		
Blockage	All	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. Flush device as per protocol if not in use.	DO NOT use anything smaller than a 10ml syringe. See guidelines for persistent withdrawal occlusion (appendix 1).

Failure to place	All.	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	All	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 (Peripheral site)	All	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

10. Midline Specific Considerations

1. No X-ray is required to confirm the position. The midline placer will confirm the line is correctly placed and document when it is ready for use.
2. The manufacturers guidelines specify that the midline is a peripheral line and only drugs between the ***pH's of 5.0-9.0 and an Osmolarity of < 500OSM/Kg*** should be injected into it. The table below is a guide for some of the IV medication that can be administered. Please consult IV specialist nurse or pharmacist for further information.

11. Power Injection

POWERGLIDE MIDLINE

Information about the device specifications can be found on the hub of the catheter. Most importantly, this information will identify whether the catheter is power injectable for CT Contrast.



Catheter Length		Catheter Name		Power Injection Rate	
The PowerGlide™ Midline Catheter is a non-trimmable catheter, with the catheter length printed on top of the catheter hub, so you can easily identify where the tip of the catheter resides.		Each PowerGlide™ Midline Catheter has the name of the device printed right on the catheter hub, so there's no guessing what type of catheter you're dealing with.		The maximum power injection flow rate is printed on the side of the catheter hub for quick reference. All PowerGlide™ Midline Catheters are rated up to 325 psi.	
Catheter Length	Catheter Gauge	Maximum Power Injector Pressure Setting	Gravity Flow Rate (mL/hr)	Priming Volume (mL)	Power Injection Flow Rate
8 cm	22 G	325 psi	1,413	0.13	2 mL/sec
8 cm	20 G	325 psi	2,108	0.13	5 mL/sec
10 cm	20 G	325 psi	2,108	0.15	5 mL/sec
8cm	18 G	325 psi	3,638	0.16	7 mL/sec
10 cm	18 G	325 psi	3,379	0.17	7 mL/sec

BBraun Introcan Deep Access catheters

Gauge	Size	Order code	Gravity flow rate (mL/min)	Power injection max pressure	Material
24G*	1.25 in. (32mm)	4251623-02	17	Not Applicable	PUR
22G	2.5 in. (64mm)	4251622-02	24	300 PSI	PUR
20G	2.5 in. (64mm)	4251621-02	51	300 PSI	PUR
18G	2.5 in. (64mm)	4251620-02	85	300 PSI	PUR

* Small gauge



PLan1 Health midline line 3fr, 4 fr, 5fr**CODE - MIDLINE NON-REVERSE TAPER 20 cm WITH STYLET**

201.67.42.13	Single	3FR	PUR	200	2
201.67.42.14	Single	4FR	PUR	200	5
201.67.42.15	Single	5FR	PUR	200	7
201.67.42.24	Double	4FR	PUR	200	2
201.67.42.25	Double	5FR	PUR	200	5

Full version control record

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Version History

Version	Date	Guideline Lead(s)	Status	Comment
1		Advanced Nurse Practitioner, Vascular Access	Final	
2	05.11.2019	Andrew Barton, IV Therapy and Vascular Access Organisational Lead	Final	Ratified at NMB
3	March 2025	Andrew Barton, 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 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
Guideline	Procedural Sedation and Analgesia
Guideline	FHFT IPC Manual available at https://guidelines.fhft.nhs.uk/
Guideline	RCN Infusion Standards
Guideline	INS Infusion Standards
Guidance	Epic