

PROTOCOL FOR THE INSERTION, MANAGEMENT AND REMOVAL OF PERIPHERAL VASCULAR DEVICES (CANNULA)

This protocol does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.

INTRODUCTION

This protocol is intended to improve patient care in the insertion and management of Peripheral Vascular Devices (PVD's) by standardising practice and is based on current knowledge and evidence.

The patients covered by this protocol are all adult patients requiring a Peripheral Vascular Device.

THIS PROTOCOL IS FOR USE BY THE FOLLOWING STAFF GROUPS:

See the protocol for competencies required.

Lead Clinician(s)

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Reviewed and approved by the Trust
Infection Control Committee:

14th July 2015

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30th October 2019

This is the most current document and is to be used until a revised version is available

Key amendments to this Document:

Date	Amendment	By:
August 2012	Full document review and update of all references against current best practice guidance	Tracey Fell
Sept 2012	Updated PVD record sheet and approval to change reference from WAHT-NUR-043	Heather Gentry
June 2015	Full document review no amendments made on CVAD and PVD group work stream for further review pending development of IV therapy choice algorithm	Heather Gentry
Aug 2017	Document extended for 6 months as per TMC paper approved 22 nd July 2015	TMC

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Dec 2017	Document extended for 3 months as per TLG recommendation	TLG
Jan 2018	Change wording of 'expiry date' on front page to the sentence added in at the request of the Coroner	
March 2018	Document extended for 3 months as approved by TLG	TLG
June 2018	Document extended for 3 months as per TLG recommendation	TLG
October 2018	Document extended until end of November	Heather Gentry
April 2019	Document extended for 6 months whilst review process takes place	TIPCC

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This protocol needs to be implemented in accordance with the following related policies:
WAHT-CG-516 - Policy and Procedures for the Administration of Injectable Medicines
WAHT-CG-481 - Waste Management Policy
WAHT-INF-002 - Hand Hygiene Policy
WAHT-INF-025 - Aseptic Technique Policy

PROTOCOL FOR THE INSERTION, MANAGEMENT AND REMOVAL OF PERIPHERAL VASCULAR DEVICES (CANNULA)

INTRODUCTION

This protocol is intended to improve patient care in the insertion and management of Peripheral Vascular Devices (PVD's) by standardising practice and is based on current knowledge and evidence.

A cannula is defined as a hollow plastic tube used for accessing the vascular system (Weller, 2005). Inserting a peripheral venous cannula (PVC) is an integral part of the care for patients requiring intravenous therapy for example, during critical illness, investigative procedures or surgery.

COMPETENCIES REQUIRED

Before the practitioner is deemed competent to cannulate independently, the following criteria must be met:

- Attendance and successful completion of the Trust Intra Venous Cannulation course, which includes theory & practice.
- Achievement of 5 successful supervised cannulations by a competent mentor or 1 successful cannulation if evidence of prior competency can be demonstrated.

Nursing and Midwifery practitioners will be assessed as above.

It is expected that Medical Practitioners will have undertaken competency based training in accordance with their own medical training and will practise according to this protocol.

Generic workers & maternity support workers will only insert a cannula under the direction of medical or registered nursing and midwifery staff who are competent to perform the insertion of PVD and will be trained to the same standards as the medical, nursing and midwifery staff. They must work under the supervision of their designated line manager.

In addition to attending a formal training programme, formal competency assessment is required for a practitioner to be approved as competent in (Insert title of protocol). Assessment must be performed by a practitioner who has been assessed as competent to perform (insert title of protocol) and hold a current recognised qualification to assess practice e.g. PGC Teacher in Healthcare, Mentorship qualification or ENB 998.

A register of competent practitioners trained within the Trust or assessed as competent (if trained outside the Trust and evidence of prior competency) will be held centrally by the training and development department Trust.

PROTOCOL

SITE SELECTION

It is important to undertake a full assessment of the patient and their veins before the vein and the device are chosen.

INSERTION OF AN INTRAVENOUS CANNULA SHOULD ONLY BE CONSIDERED IF THERE IS A CLEAR INDICATION FOR ITS USE.

When selecting a vein for **cannulation** there are a number of factors, which should be taken into consideration:

- Insertion site
- Condition of the vein
- Purpose of the infusion (rate and solution to be infused)
- Duration of therapy – over 7 days consider Central Venous Access Device (CVAD)

The sites of choice are branches of the **metacarpal veins**, **basilic vein**, and the **cephalic vein**.

Preference should be given to a vessel which is unused, easily detected by inspection and or palpation, patent and healthy. These veins feel soft, bouncy and will refill when depressed. They should be straight and free of valves to ensure easy advancement of the cannula into the vein. Valves can be felt as small bumps in the vein or may be visualised at bifurcations (Mallet & Bailey 1999).

The **median cubital vein** of the antecubital fossa is often used, however this should be avoided wherever possible due to it being in an area of flexion and its close proximity to arteries and nerves. In emergency situations e.g. cardiac arrest, it is acceptable practice to use these veins.

The metacarpal veins are easily visualised and palpated. However, the use of these veins is contraindicated in the elderly where skin turgor and subcutaneous tissues are diminished (Weinstein 2000). It is recognised however, that there are occasions where the metacarpal veins are the only veins available. In these circumstances the practitioner would need to use their professional judgement.

VEINS TO AVOID

Visual inspection will enable the practitioner to avoid areas of phlebitis, infection or oedema, bruised or inflamed veins, or any veins which have undergone multiple punctures. If previous phlebotic or infiltrated areas are used for cannulation, accurate site assessments cannot be performed. Also if damaged veins are used, greater injury to the skin and vein will occur (Perucca 1995).

The use of veins which are tender, sclerosed, thrombosed, fibrosed or hard is unacceptable and can result in pain and undue stress to the patient. (Weinstein, 1993).

It is important to note that veins should not be re-cannulated at a point lower than a recently used site in the same vein. Healing will be adversely affected if the vein continues to be used for infusion. Problems relating to phlebitis, thrombophlebitis and infection could be exacerbated for the same reason (Finlay 2004).

CANNULATION PROCEDURE

Equipment:

- Clean solid plastic sharps bin tray and Sharps disposal container
- Trust PVD Insertion Pack
- Clean Apron
- Consider eye protection if there is a risk of blood splash
- Non sterile procedure gloves
- Disposable tourniquet
- Alcohol sanitising hand gel

Procedure:

1. Approach the patient and explain the procedure and gain their consent. Ascertain any previous problems the patient may have had and any allergies. Consider the use of topical or subcutaneous local anaesthetic if a large gauge cannula is required and for patients with a needle phobia. The anaesthetic must be prescribed prior to the administration.
2. Carefully wash hands using liquid soap and water and dry thoroughly. Apply apron and consider using eye protection if there is a risk of blood splash.
3. Prepare all equipment required to cannulate the patient.
4. Open the PVD Insertion pack in readiness for the procedure.
5. Decontaminate hands using alcohol hand gel and rub until dry and don non-sterile surgical gloves.

Select the cannulation site.

Create adequate venous filling by applying a disposable tourniquet, designed for the purpose, to the upper arm on the chosen side. The tourniquet should be applied 5-10cms above the cannulation site. The tourniquet should be tight enough to obstruct venous return but not arterial flow (you should still be able to feel a pulse).

- a) Avoid limbs with compromised circulation (i.e. lymphoedema or arm following breast surgery)
- b) Avoid veins that have had recent venepunctures
- c) Avoid joint areas
- d) Avoid access near long term indwelling devices

If necessary, encourage venous filling by tapping the vein lightly, gently opening and closing the fist, lowering the extremity below heart level, applying a warm compress or immersing the limb in warm water.

The selected site should be socially clean and intact prior to cannulation (if not, clean with soap and water) then clean the selected skin site with 2% chlorhexidine gluconate and 70% isopropyl alcohol (DOH 2007) e.g. Chloroprep SEPP 0.67ml.

The prepared skin area should be 4 to 5 cms square. The solution should be applied with back and forth and up and down strokes for 30 seconds.

The area should be allowed to air dry for a minimum of 30 seconds.

Do not re-palpate the vein or touch the skin.

If patient is sensitive to chlorhexidine use a single patient use povidone-iodine application.

Remove the safety cannula/device from the packaging and inspect for any faults. Adherence to an aseptic no touch technique (ANTT) during cannulation insertion and for all subsequent care and management is essential to avoid risk of infection.

Anchor the vein by applying manual traction on the skin a few centimetres below the proposed insertion site with your non-dominant hand.

Using your dominant hand insert the cannula/device, bevel side uppermost, into the skin at an angle of 15 to 40° (dependent on the depth of the vein).

Entry of the needle tip into the vein is indicated by the presence of blood in the cannula flashback chamber.

Level the device by decreasing the angle between the cannula and the skin and advance the cannula a further 2 mm into the vein. This ensures that both the stylet and cannula have entered the vein.

Either hold the stylet stationary while advancing the cannula off the stylet (off the needle method) OR withdraw the stylet slightly so that the stylet is within the cannula but still accessing the vein, observe for secondary flashback and slowly advance cannula and stylet as one into the vein (hooded technique).

Release the tourniquet, apply pressure to the vein above the cannula tip (to avoid blood spillage) and remove stylet completely.

Dispose of the stylet immediately into an approved sharps container at point of use.

If practitioner needs to take a blood specimen from the cannula it should be done at this point using a blue luer slip adapter for the vacuum blood collection system.

Attach the obturator cap, administration set or an appropriate primed extension set such as a Vygon Octopus with Bionector.

Secure the cannula with a sterile, transparent, waterproof dressing such as Smith & Nephew IV 3000 to allow clear visibility of the insertion site.

Flush the cannula with 5 mls of normal saline 0.9% (in a 10ml syringe), using a push-pause method (see flushing the cannula) to check patency, observing the site for signs of swelling or leakage. Ask the patient to report any pain or discomfort.

Remove gloves and apron and eye protection if use

Carefully wash hands using liquid soap and water and dry thoroughly.

Document on the Peripheral Vascular Device Record Sheet the date and time of PVD insertion, patient details, name and signature of the practitioner who inserted the cannula, the type and gauge of the cannula, site used and the reason for the cannulation. Date of when

the cannula should be removed must be recorded in the clinical record and on the dressing. Unsuccessful attempts, the number taken and reason for failure should be documented in the medical record. Administration of saline flush should be prescribed and documented on the medication chart.

Practitioners should only make two attempts at cannulation. If both attempts fail the procedure should be referred to another experienced colleague. Cannulas are single use only and a new cannula must be used for each attempt.

CARE OF CANNULA

- When a cannula is inserted within the Trust, it is the responsibility of the person inserting the cannula to record this on the Peripheral Vascular Device Record Sheet (See Appendix One).
- Management and aftercare of a peripheral vascular access device following insertion is the responsibility of all who care for the cannula and the patient.
- The cannula site should be inspected for signs of phlebitis, inflammation or infiltration before and after intermittent injection of drugs twice daily (Saving Lives 2010). If the phlebitis score is stage 1 or above the cannula should be removed. If IV access is still required a new cannula should be sited as a priority without causing undue disruption or delay of IV therapy and IV medications. The phlebitis score must be documented twice daily on the Peripheral Vascular Devices Record Sheet.(See appendix One). The need for the cannula must be assessed daily and this must be documented on the Peripheral Vascular Devices Record Sheet.
- The cannula should be removed at 72 hours unless earlier change is indicated by the phlebitis score or clinical need.
- Remove and change dressing carefully, if wet or soiled using aseptic non touch technique
- When handling equipment and associated apparatus always use aseptic non touch technique and wear procedure gloves to avoid contamination.
- Administration sets/lines must be changed every 72 hours for continuous infusions. When administering blood, the set must be changed when a transfusion episode is complete or every 12 hours, whichever is sooner (RCN, 2010). If at any time an administration set is disconnected from the patient it must be discarded as a single item into the appropriate waste stream and a new set attached. The fluid being administered will need to be discarded and a new infusion bag commenced when the replacement line is attached.
- All connections should be checked for tightness and the port cap should be kept closed at all times. Do not over tighten connections.
- Flush the cannula with 5mls 0.9% sodium chloride (in a 10ml syringe) 8 hourly if not actively being used and prior to and following intermittent administration of IV therapy.
- All ports should be cleansed with a 2% chlorhexidine gluconate and 70% isopropyl alcohol hard surface wipe and allowed to dry for 30 seconds prior to accessing port.

COMPLICATIONS AND PREVENTION

Haematoma:

- To avoid insertion related haematoma ensure adequate venous filling and plan procedure carefully.
- To prevent withdrawal haematoma apply digital pressure to the puncture site for 3 to 4 minutes after removal of cannula. Avoid flexion points of the hand if cannula removed from an area that can be flexed e.g. antecubital fossa.

Infiltration:

- Avoid areas of flexion wherever possible.
- Use flexible plastic cannula and ensure secure fixation of cannula.

Thromboembolism:

- Avoid using veins in the lower extremities.
- Use the smallest cannulae necessary for the task in the most distal vein thought suitable by the practitioner.
- If an infusion stops as a result of clot formation the cannula should be re-sited.
- Flushing the cannula to dislodge a clot should not be attempted.

Air Embolism:

- Ensure all devices attached to cannula are primed and all air removed.
- Ensure infusions are discontinued before the bag or bottle completely empty.
- Ensure all luer lock fittings are hand tight.

Phlebitis and septicaemia:

- Use aseptic non touch technique.
- Choose smallest gauge cannula for prescribed treatment.
- Ensure good secure fixation of all connections.
- Dilute and administer irritant drugs as prescribed and recommended.
- Check cannula site and document cannula site twice daily and before and after intermittent administration of drugs.
- Rotate site every time cannula is re-sited and use polyurethane catheter wherever possible.
- Remove cannula at 72 hours unless earlier change is indicated by the phlebitis score or clinical need.

Extravasation:

- Check patency prior to administration of any drugs, using 5ml of (in a 10ml syringe) 0.9% sodium chloride and ensure frequent monitoring (this is essential with vesicant drugs).
- Avoid using cannula sited at points of flexion.
- Preference should be given to use of plastic cannula.
- Administer drugs in accordance with drug advice sheet, British National Formulary (BNF) or Pharmacy.
- Wherever possible, use the cannula that was inserted successfully at first attempt and give vesicants first.
- In cases where extravasation injury has occurred or is suspected refer to Injectable Medicines policy pages 15-16.

REMOVAL OF CANNULA

Equipment:

- Clean solid plastic sharps bin tray and Sharps disposal container
- Alcohol sanitising hand gel
- Non sterile procedure gloves
- Clean apron
- Sterile gauze
- Tape

Procedure:

1. Approach the patient, explain the procedure and gain their consent.
2. Carefully wash hands using liquid soap and water and dry thoroughly.
3. Prepare all equipment required for the removal of the cannula.
4. Decontaminate hands using alcohol hand gel and rub until dry and don non-sterile procedure gloves.
5. Remove dressings whilst holding the cannula securely in place (**Do not use scissors**).
6. Hold a piece of dry sterile gauze over insertion site but do not apply digital pressure until cannula removed.
7. Apply pressure for at least 3 to 4 minutes or until bleeding has stopped. Elevate arm if bleeding persists.
8. Apply fresh sterile gauze and secure with tape.
9. Check cannula to ensure catheter complete and undamaged.
10. Remove apron, gloves and eye protection if used.
11. Carefully wash hands using liquid soap and water and dry thoroughly.
12. Document the cannula removal on the Peripheral Vascular Device Record Sheet.

Best Practice guides

Canadian Intravascular Access Devices Infection Control Guidelines 8

DH Saving Lives (2007) High Impact Intervention number 2

The American Centers for Disease Control Guidelines

The ICNA audit tool 10 section on managing peripheral lines, page 41

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REFERENCES

Becton Dickinson *Best Practice in IV Therapy*

Department of Health (2007) Saving Lives: Reducing Infection, Delivering Clean and Safe Care
NHS DOH

Gabriel J (2005) Vascular Access: indications and implications for patient care. *Nursing Standard* March 9/vol 19/no 26/2005

Dougherty, L & Lister, S. (2011) *Royal Marsden Hospital Manual of Clinical Nursing Procedures*. 9th edition, West Sussex, Wiley Blackwell.

Perucca R (1995). *Obtaining Vascular Access in Intravenous Therapy: Clinical Principles and Practices* (eds Terry J, Baranowski R A, Lonsway R A, Hedrick C) WB Saunders, Philadelphia

Royal College of Nursing (2010) **Standards for infusion therapy** 3rd edn Royal College of Nursing, London available from <http://www.bbraun.it/documents/RCN-Guidelines-for-IV-therapy.pdf> [Accessed 13/07/2015]

Weinstein, S.M. (2006) *Plumer's Principles and Practice of Intravenous Therapy*, 8th edn. J.B. Lippincott, Philadelphia.

Weller, B. F (2009) *Baillieres nurses dictionary*, 25th edn, Edinburgh: Elsevier.

Whitson M (1996) Intravenous therapy in the older adult: special needs and considerations. *Journal of Intravenous Nursing* 19(5) 251-255

CONTRIBUTION LIST

Key individuals involved in reviewing the document

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David Shakespeare	Associate Chief Nursing Officer Infection Prevention and Control
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Supporting Document 1 – Checklist for review and approval of key documents

This checklist is designed to be completed whilst a key document is being developed / reviewed. A completed checklist will need to be returned with the document before it can be published on the intranet.

For documents that are being reviewed and reissued without change, this checklist will still need to be completed, to ensure that the document is in the correct format, has any new documentation included.

1	Type of document	Protocol
2	Title of document	Protocol for the Insertion and Management of PVD
3	Is this a new document?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
4	For existing documents, have you included and completed the key amendments box?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
5	Owning department	Infection Prevention and Control
6	Clinical lead/s	Dr S Graystone, Consultant Anaesthetist WRH Heather Gentry, Lead Nurse Infection Prevention Team Sethu Sundari, Practice Development Facilitator
7	Pharmacist name (required if medication is involved)	
8	Has all mandatory content been included (see relevant document template)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
9	If this is a new document have properly completed Equality Impact and Financial Assessments been included?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
10	Please describe the consultation that has been carried out for this document	Members of TIPCC Matrons Clinical Leads
11	Please state how you want the title of this document to appear on the intranet, for search purposes and which specialty this document relates to.	Infection Prevention and Control Protocol for the Insertion and Management of PVD

Once the document has been developed and is ready for approval, send to the Clinical Governance Department, along with this partially completed checklist, for them to check format, mandatory content etc. Once checked, the document and checklist will be submitted to relevant committee for approval.

Implementation

Briefly describe the steps that will be taken to ensure that this key document is implemented

Action	Person responsible	Timescale
Launch to Matrons at Senior Nurses Meeting, Ward Sisters and Infection Prevention Link Nurses at their relevant meetings for wider dissemination to ward and departmental nursing staff	Lead IPC Nurse	
Launch to all clinical staff through Trust Brief	Lead IPC Nurse	
Launch to all medical colleagues via Clinical Directors and presentation at relevant speciality audit meetings if requested	Associate Director Infection Prevention and Control/Consultant Microbiologist	
Protocol will underpin content to all training in relation to peripheral vascular device (PVD) insertion, management and removal.	All clinical staff involved in teaching or assessing competence in relation to PVD	

Plan for dissemination

Disseminated to	Date
Instruction to all clinical staff of revised protocol via weekly Trust Brief.	
Ward and departmental based clinical staff via Infection Prevention Link Nurses	
Updated protocol to be made available via IPC intranet site	

1	Step 1 To be completed by Clinical Governance Department Is the document in the correct format? Yes <input type="checkbox"/> No <input type="checkbox"/> Has all mandatory content been included? Yes <input type="checkbox"/> No <input type="checkbox"/> Date form returned _____/_____/_____	
2	Name of the approving body (person or committee/s)	
	Step 2 To be completed by Committee Chair/ Accountable Director	
3	Approved by (Name of Chair/ Accountable Director):	
4	Approval date	_____/_____/_____

Please return an electronic version of the approved document and completed checklist to the Clinical Governance Department, and ensure that a copy of the committee minutes is also provided.

Office use only	Reference Number	Date form received	Date document published	Version No.
	WAHT-INF-035			2

Supporting Document 2 - Equality Impact Assessment Tool

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

		Yes/No	Comments
1.	Does the policy/guidance affect one group less or more favourably than another on the basis of:		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Transgender	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
	• Disability - learning disabilities, physical disability, sensory impairment & mental health problems	No	
2.	Is there any evidence that some groups are affected differently?	No	
3.	If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?	No	
4.	Is the impact of the policy/guidance likely to be negative?	No	
5.	If so can the impact be avoided?	No	
6.	What alternatives are there to achieving the policy/guidance without the impact?	No	
7.	Can we reduce the impact by taking different action?	No	

If you have identified a potential discriminatory impact of this key document, please refer it to Assistant Manager of Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact Assistant Manager of Human Resources.

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It is the responsibility of every individual to check this is the latest version of the document

Supporting Document 3 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	Yes/No
1.	Does the implementation of this document require any additional Capital resources	No
2.	Does the implementation of this document require additional revenue	No
3.	Does the implementation of this document require additional manpower	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments:	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval