# Peripheral Intravenous Cannula Insertion and Management

This document should be read in conjunction with the Disclaimer

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Aims

- To prevent unnecessary IV peripheral cannulation.
- To improve techniques for those patients who do require this procedure and ultimately reduce cannulation related infections.
- To ensure a consistently high standard of practice across the organisation.

Key Points

1. PIVC insertion must be performed by, or under the direct supervision of, a Health Care Worker (HCW) experienced in PIVC cannulation. All HCWs who perform PIVC cannulation are to complete a theoretical and practical assessment. The HCW must be able to demonstrate sound theoretical knowledge of vasculature and PIVC associated complications, and practical skill in aseptic technique. The practical assessment is to include two successful supervised insertions.

2. A cannula should not be inserted into any patients on a 'just in case' basis. This does not include women requiring prophylactic cannulation due to individual risk factors.

3. This procedure requires strict adherence to hand hygiene and aseptic technique.

4. In a non-emergency situation no more than 2 attempts at IV peripheral cannulation may be made on any one patient by the same HCP. If unsuccessful, another competent member of staff shall carry out the procedure. Where this is not possible the HCP must assess the risk of further attempts against the risk of a delay in treatment. Consider the use of ultrasound guidance to locate veins. Alternatives are to be considered where further attempts have been made by the most senior HCP.

5. If venous access is required, ensure the most appropriate venous access device is chosen e.g. when repeated or prolonger administration of vesicant or irritant solutions such as potassium chloride, flucloxicillin or vancomycin, is required central venous access should be considered to avoid peripheral vein damage.

6. PIVC are to be routinely sited in the distal areas of the upper limbs. Wherever possible use basilica or cephalic veins on the posterior forearm or the dorsum of the hand on the woman’s non dominant side. From an infection control aspect, use of the Antecubital Fossa should not be used at first attempt, unless for resuscitation purposes. Sites away from infected, bruised or thrombosed veins should be selected.

7. Subsequent PIVC are to be inserted, where possible, proximal to the previous site.

8. Where possible, avoid the use of veins in the following sites:
   - Anterior (ventral) forearm veins especially the cephalic vein in patients with chronic renal failure.
   - Limbs on the side of a previous mastectomy or axillary clearance.
   - Limbs affected by a cerebrovascular accident (CVA) or if there is lymphoedema.
   - Veins in the lower extremities due to the risk of embolism.
   - A limb with an arteriovenous fistula or shunt.
- Areas below previous cannulation sites, bruises or phlebitis areas.
- Areas of flexion or bony prominences

9. At all times the smallest size cannula possible, relevant to its subsequent use should be used. Obstetric patients who require intravenous cannulation always have a 16G cannula inserted.

10. At each attempt at cannulation, a sterile cannula must be used and skin prepared as below.

11. The use of local anaesthetics to reduce the pain of insertion should be considered before the insertion of any PIVC, regardless of PIVC size and age of the patient.

12. For patients with a history of chlorhexidine sensitivity or allergy, use povidone iodine 10% in 70% ethyl alcohol and allow to air dry. If alcohol is contraindicated, use an aqueous povidone iodine solution.

13. All cannula must have an extension set attached e.g. J loop. This maintains stability, reduces trauma to the vein and increases cannula longevity. IV extension sets should only be used with single infusions or intermittent bolus medications. They should not be used with multiple infusions - a multi lumen port should be used. The extensions shall be changed at each cannula resite.

14. PIVC utilised for short stay patients such as outpatients, emergency or procedural settings do not require an extension set to be attached. For patients who are initially planned as day stay patients, but then require overnight admission to the ward an extension set should be attached.

15. A peripheral cannula inserted in an emergency situation or by the ambulance service must be replaced as soon as the patient’s condition has stabilised or within 24 hours of insertion.

16. Peripheral intravenous cannula should be removed after 24 hours of insertion if not used within this time period.

17. All PIVC are to be reviewed daily or when clinically indicated, for ongoing need and removed as soon as no longer required. If continued access is required all PIVCs in adults are to be re-sited at 72 hours or more frequently if clinically indicated.

18. All sites must be inspected and scored using the Peripheral Intravenous Assessment Score (PIVAS) tool as a minimum every 8 hours, prior to every administration of intravenous drug and for 48 hours post removal. This must be documented on the MR280 Intravenous Device Insertion and Management Record.

19. Documentation of the insertion date, time, site, the name of the HCP who performed the cannulation, number of attempts, issues encountered with insertion and the removal date, time and reason must be recorded in the patient’s medical record and / or on the MR820 Intravenous Device Insertion and Management Record.

20. All PIVC related blood stream infections are to be reported as a clinical incident on Datix CIMS.
Insertion

Equipment
- Sterile Gloves
- ITL Healthcare Intravenous Cannula Insertion Pack
- Extension set (e.g. J loop, triple lumen extension) when required.

Additional items that may be required
- Topical local anaesthetic e.g. EMLA™ (to be applied locally 20 minutes prior to the procedure)
- Lignocaine 1%

Procedure
1. Undertake a risk assessment to establish if peripheral cannulation is required.
2. Confirm the patient’s identity.
3. Explain the procedure to the patient and gain verbal consent.
4. Check for patient allergies (in particular allergies to tapes and skin preparation)
5. Where possible, ask the patient to clean their hand and arm with soap and water.
6. The HCP must be Bare below the elbows.
7. Perform hand hygiene using either soap and water or the alcohol hand rub.
8. Collect a reusable plastic tray and wipe the tray with an alcohol wipe (Promedical wipe). The tray must be left to air dry.
9. Collect the necessary equipment. Check the packaging for any damage and check the expiry date.
10. Perform hand hygiene using either the alcohol rub or soap and water.
11. Prepare the flush and prime the extension set using a non-touch technique.
12. Position the woman’s arm appropriately on the drape and a pillow.
13. Place the continence sheet under the patient.
14. Apply the disposable tourniquet, locate the vein and release the tourniquet.
15. Perform an antiseptic hand wash using the chlorhexidine hand wash.
16. Retighten the tourniquet.
17. Apply gloves.
18. Clean the site for 30 seconds using the chlorhexidine 2% and alcohol 70% swab stick. Allow to air dry. For patients with a history of chlorhexidine sensitivity / allergy, use povidone iodine 10% in 70% ethyl alcohol and allow to air dry. If alcohol is contraindicated, use an aqueous 10% povidone – iodine solution.
19. Anchor the vein below the puncture site and insert the cannula using a non-touch technique.
20. Using a non-touch technique, attach the extension set, wipe the bung with the chlorhexidine and alcohol swab, flush the device and apply a semi permeable dressing.

21. Secure the dressing, taking care not to contaminate the adhesive part of the dressing, where the cannula hub and the extension set connect and ensuring the dressing is firmly adhered to the skin.

22. The insertion site should remain visible for inspection so do not place opaque tape directly over the inspection site.

23. Dispose of the yellow tray / sharp and other equipment appropriately.

24. Clean the plastic tray/ dressing/ IV trolley with an alcohol wipe.

25. Dispose of the gloves.

26. Perform hand hygiene with either the alcohol hand rub or soap and water.

27. Write the date of insertion on the sterile, transparent semi-permeable dressing using the adhesive label on the dressing.

28. Document the date and time of insertion, the name of the HCP who performed the cannulation on the Peripheral Intravenous Cannula (PIVC) form MR 820.

Monitoring

- All PIVCs are to be assessed for patency and for any signs of complications each time the device is accessed.
- The need for the PIVC is to be reviewed daily or when clinically indicated, and the PIVC removed as soon as it is no longer required.
- Nursing / midwifery staff are responsible for recording a PIVAS each shift (8 hourly) by assessing the PIVC site for patency, erythema, swelling, pain or tenderness and recording the findings on the MR820 Intravenous Device Insertion and Management Record.
- All PIVC are to be removed as soon as they are no longer required and are in adults are not to remain in situ longer than 72 hours.
- The responsible medical officer is to review the need for PIVC access daily, and if ongoing access is required past 72 hours, planned resiting of the PIVC is to occur.
- Remove the PIVC if PIVAS is ≥ 2 or fever >38°C or signs of sepsis are evident.
- The dressing is to be replaced if it becomes wet, soiled or loose using an aseptic technique.
- If a PIVC becomes accidentally or inadvertently partially withdrawn of dislodged, the PIVC is to be removed and anew PIVC inserted as soon as practical.19
- Remove PIVCs that may have been inserted without adherence to aseptic technique e.g. resuscitation as soon as practical and within 24 hours of insertion.
• If prolonged IV therapy is likely to be required, consideration for a central catheter should be given rather than multiple replacements of PIVCs.
• If extravasation occurs special precautions are required prior to removal of the PIVC. Refer to medical treating team.
• Routine culturing of PIVC tips is not recommended unless infection is suspected. See below.
• Document removal of PIVC in the patient’s medical record, including the time and date and the condition of the site post removal.

Removing the PIVC if infection is suspected
• If infection is suspected, inform the treating medical officer. Two sets of blood cultures are to be collected. Blood culture samples are to be drawn from another peripheral vein. Blood must not be drawn from the existing PIVC. Ensure aseptic technique during sampling.
• Any PIVC site discharge should be swabbed and sent for culture.
• On removal of the PIVC send catheter tip for culture in a sterile screw top container NB: blood cultures must accompany tip.
• All actions are to be documented in the patient’s medical record.
• Report significant local and PIVC related site infection via Datex CIMS.

PIVC Flushing
• Where possible, PIVC are to have a continuous flow of IV fluids through them.
• If the patient is receiving intermittent injections or infusions, flushing under positive pressure is recommended to promote and maintain patency and prevent the mixing of incompatible medications and solutions.
• PIVC are to be flushed with 5-10mL of sterile 0.9% sodium chloride for injection using a 10ml Luer-lock syringe or commercially available pre-filled syringe to help avoid excessive pressure.
• HCPs are to flush PIVC, using a pulsatile motion (push-pause):
  ➢ after the PIVC is inserted and prior to use to confirm placement
  ➢ before each medication or infusion is given to ensure the PIVC is still patent
  ➢ after each injection / infusion to remove irritant material from the vein
  ➢ between multiple infusions or medications to prevent interactions and incompatibilities
  ➢ prior to and after blood drawing.
  ➢ at least every 12 hours if the PIVC is not in use (strong consideration should be given to removing the PIVC if it has not been accessed for 12 hours).
• Disconnecting the flush syringe can allow reflux of blood into the tip of the catheter to displace the space occupied by the syringe. To prevent this source of occlusion, HCPs should clamp the extension set or withdraw the syringe while administering the last 0.5 mL of flush (positive pressure technique).
Duration and re-siting

- All PIVC are to be removed as soon as they are no longer required and are in adults are not to remain in situ longer than 72 hours.
- The responsible medical officer is to review the need for PIVC access daily, and if ongoing access is required past 72 hours, planned resiting of the PIVC is to occur.
- Remove the PIVC if PIVAS is ≥ 2 or fever >38°C or signs of sepsis are evident.
- Remove PIVCs that may have been inserted without adherence to aseptic technique e.g. resuscitation as soon as practical and within 24 hours of insertion.
- If prolonged IV therapy is likely to be required, consideration for a central catheter should be given rather than multiple replacements of PIVCs.
- If extravasation occurs special precautions are required prior to removal of the PIVC. Refer to medical treating team.
- Routine culturing of PIVC tips is not recommended unless infection is suspected.
- Document removal of PIVC in the patient’s medical record, including the time and date and the condition of the site post removal.

PIVC blood collection

- Blood may be drawn from a PIVC directly after insertion, but not at other times. Do not routinely aspirate blood samples directly from PIVC due to potential risk of haemolysis. Exceptions are in an emergency when the patient has limited vascular access or is at increased risk of bleeding or receiving thrombolytic therapy.13, 19, 20
- Blood cultures are not to be collected through a PIVC due to the increased rate of blood culture contamination at the time of collection.19

Management of administration sets

- Administration sets, including all tubing, connections, extensions sets and needleless valves are to be changed when the PIVC is re-sited at 72 hours.
- Administration sets are to be changed more frequently if contamination or accidental disconnection occurs or a blood reaction is suspected.
- When blood or blood products have been infused, change the administration set, including all IV tubing and connections immediately after completion of the infusion or every 12 hours, whichever comes first.22
- Administration sets are single use devices and if they are disconnected from the intravenous cannula for any reason, e.g. intermittent medication dosing, the set is to be discarded and a new administration set connected using aseptic technique.23
• Administration sets are not to be disconnected for routine care, e.g. showering, but may be disconnected for transient, controlled disconnections, e.g. changing IV access or infusions in operating theatres or medical imaging departments.

• Label all administration sets attached to the PIVC with an intravenous line label in accordance with the National Standard for User-Applied Labelling of Injectable Medicines, Fluids and Lines.\textsuperscript{24}

Documentation

• All documentation in relation to a PIVC is to be recorded as part of the patient’s medical record and maintained as a permanent record.

• For each PIVC inserted, the documentation is to include date and time of insertion, anatomical site of insertion and the name of the HCP inserting the PIVC, the removal date and time and the reason for removal e.g. treatment complete, pain, dislodgement, PIVAS greater than 2, extravasation, vessel hardness or emergency insertion. Documentation is to address a PIVC that has been inserted in an emergency situation or when there have been failed insertion attempts.

• The use of an IV insertion label, noting date and time of insertion and signature of HCP inserting the PIVC, is to be used as a visual prompt on the PIVC dressing. They are to be placed on the external transparent dressing, so that they are visible but will not interfere with assessing the PIVC site.

• A PIVAS is to be recorded for each PIVC site, each shift for the duration the PIVC is insitu and for 48 hours following removal to detect post-removal complications on the MR820 Intravenous Device Insertion and Management Record. Ongoing PIVC site issues beyond 48 hours are to be documented in the patients’ medical record.

• All clinical interventions for each PIVC site are to be recorded in the patients’ medical record.

Patient education

Ensure patients are provided with information in relation to their PIVC and possible complications. HCP’s are to have a discussion with the patient to ensure they understand the information provided to them. The PIVC packs contain the consumer information sheet.
## Appendix 1: PIVC Chart - Adult

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>PIVC #</th>
<th>Insertion Date</th>
<th>Insertion Time</th>
<th>Site</th>
<th>Removal Reason</th>
<th>Removal Date</th>
<th>Removal Time</th>
<th>Signature</th>
<th>Incident Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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**IV Pack Sticker**

If the patient is to have extended or vesicant IV treatment, consider alternative Intravenous Vascular Access Devices eg CVC
**PERIPHERAL INTRAVENTOUS CANNULA (PIVC) INSERTION & MANAGEMENT RECORD - ADULT**

**PERIPHERAL INTRAVENTOUS ASSESSMENT SCORE (PIVAS)**

Assess the PIVC site each time it is accessed and ensure a PIVAS is documented each shift.

<table>
<thead>
<tr>
<th>LOOK</th>
<th>LISTEN</th>
<th>FEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Observe PIVC site &amp; associated limb for erythema, swelling or exudate / oozing / moisture</td>
<td>Is there pain or tenderness on infusion / palpation or movement?</td>
<td>Palpate the site through the intact dressing.</td>
</tr>
<tr>
<td>• Dressing intact, clean and dry?</td>
<td></td>
<td>Is there any heat or vessel hardening?</td>
</tr>
<tr>
<td>• Date &amp; time of insertion on dressing?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PIVAS**

**CLINICAL ASSESSMENT AND INTERVENTIONS**

Always use Look, Listen and Feel observations noted above.

If Patient requires extended or vesicant IV therapy, consider appropriate Vascular Access Device.

<table>
<thead>
<tr>
<th>PIVAS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy IV site</td>
<td>No signs of phlebitis</td>
</tr>
<tr>
<td></td>
<td>No identified concerns in relation to the Look, Listen and Feel observations above</td>
</tr>
<tr>
<td></td>
<td>Replace dressing if not intact, clean and dry</td>
</tr>
</tbody>
</table>

One of the following is evident:

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<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>Pain, tenderness or erythema at IV site</td>
</tr>
<tr>
<td></td>
<td>Discuss with Medical Officer and consider review of infusion rate or further dilution of medications</td>
</tr>
<tr>
<td></td>
<td>Replace dressing if not clean, dry and intact</td>
</tr>
<tr>
<td></td>
<td>Continue to observe site closely and document each shift</td>
</tr>
</tbody>
</table>

Two of the following signs or symptoms are evident:

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>2</td>
<td>Pain, Erythema, Swelling, discharge, palpable venous cord</td>
</tr>
<tr>
<td></td>
<td>Remove PIVC immediately</td>
</tr>
<tr>
<td></td>
<td>Liaise with Medical Officer and Re-site only if required</td>
</tr>
<tr>
<td></td>
<td>Document signs and symptoms, PIVAS and actions in patient’s medical record</td>
</tr>
<tr>
<td></td>
<td>Complete CIMS</td>
</tr>
<tr>
<td></td>
<td>Continue to observe all IV sites and document each shift until healed</td>
</tr>
</tbody>
</table>

A PIVAS SCORE OF 2 OR ABOVE with associated fever > 38°C not explained by other causes requires collection of 2 sets of blood cultures and the PIVC tip sent for culture.

<p>| | |</p>
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<tbody>
<tr>
<td>3</td>
<td>Medium stage of phlebitis</td>
</tr>
<tr>
<td></td>
<td>ALL of the following are evident and extensive:</td>
</tr>
<tr>
<td></td>
<td>Pain along path of cannula, Erythema, Induration, Palpable venous cord</td>
</tr>
<tr>
<td></td>
<td>Also possibly evident: Pus, pyrexia.</td>
</tr>
<tr>
<td></td>
<td>Actions:</td>
</tr>
<tr>
<td></td>
<td>Remove PIVC immediately and inform Medical Officer</td>
</tr>
<tr>
<td></td>
<td>If on-going IV treatment required consider alternate venous access device</td>
</tr>
<tr>
<td></td>
<td>Document signs and symptoms, PIVAS and actions in patient’s medical record</td>
</tr>
<tr>
<td></td>
<td>Initiate additional treatment as required</td>
</tr>
<tr>
<td></td>
<td>Complete CIMS</td>
</tr>
<tr>
<td></td>
<td>Continue to observe and record status of PIVC site until healed</td>
</tr>
<tr>
<td></td>
<td>If discharged from hospital advise GP for review</td>
</tr>
</tbody>
</table>

References


Related policies


Related WNHS policies, procedures and guidelines

Infection Control Manual

Keywords: PIVC, peripheral, intravenous cannula, infection, insertion, removal, monitoring, dressing

Document owner: OGCCU

Author / Reviewer: Evidence Based Clinical Guidelines Co-ordinator

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Endorsed by: Obstetrics, Gynaecology & Imaging Directorate Management

Next review date: Nov 2019

Date: 07.11.2016

Standards Applicable: NSQHS Standards: 1 Clinical Care is Guided by Current Best Practice; 3 Infection Control

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