

GUIDELINE for the PERIPHERAL INTRAVENOUS CANNULA (PIVC) INSERTION and POST INSERTION CARE in ADULT PATIENTS

PURPOSE

The purpose of this Guideline is to provide the standard for insertion, management and removal of peripheral intravenous cannulae (PIVC) in patients who are 16 years of age and older.

KEY PRINCIPLES

All clinical staff who insert a PIVC or care for a patient with a PIVC *in situ* should follow this Guideline.

Aseptic technique should be used during each PIVC insertion and access to reduce the risk of local or systemic infection.

Every PIVC insertion should be documented at the time of insertion or as soon as possible afterwards.

USE OF THE GUIDELINE

Chief Executives and delegated officers are expected to promote safe practices for insertion and post insertion care of PIVCs across their Health District/Service.

Clinical Staff Inserting PIVC Devices

- Adhere to this guideline for every insertion of a PIVC.
- Ensure PIVC insertion is documented in the patient's health record.
- Are trained to insert PIVC in accordance with this guideline.

Clinical Staff Caring for, Managing and Removing PIVC Devices:

- Adhere to this guideline for post insertion care of a PIVC device.
- Are trained in the care of a PIVC device in accordance with this guideline.
- Assess daily the ongoing need for a PIVC device.

REVISION HISTORY

Version	Approved by	Amendment notes
Version 1.0	Draft	New Guideline

ATTACHMENT

Guideline for PIVC Insertion and Post Insertion Care in Adult Patients

ASSOCIATED DOCUMENTS

NSW Health Infection Control Policy (PD2007_036)

NSW Health Infection Control Policy: Prevention & Management of Multi-Resistant Organisms (MRO) (PD 2007_084)

NSW Health Recognition and Management of a Patient who is Clinically Deteriorating (PD2010_026)

NSW Health Hand Hygiene Policy (PD2010_058)

NSW Health Central Venous Access Device Insertion and Post Insertion Care (PD2011_060)

NSW Health User applied Labelling of Injectable Medicines, Fluids and Lines (PD2012_007)

DRAFT

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1 BACKGROUND

Introduction

Peripheral intravenous cannula (PIVC) insertion is an invasive procedure that has the potential for serious immediate or delayed complications.

This Guideline is relevant to all clinicians who insert or manage PIVCs in patients who are 16 years of age and older.

Purpose

This Guideline outlines the principles for the safe insertion, management and removal of PIVCs in adult patients in NSW Health facilities. Facilities should follow this Guideline, regardless of the clinical setting. The guideline also aims to minimise complications from the insertion and management of PIVCs.

Other options should be considered before deciding to insert a PIVC, such as oral medication, nasogastric tube feeding, or central intravenous line.

In some emergency situations, it may not be possible to fully comply with this Guideline. PIVCs inserted in such situations should be replaced as soon as practical within 24 hours.

Key definitions

Alcohol-based hand rub (ABHR)	An alcohol-containing preparation designed for application to the hands in order to reduce the number of viable micro-organisms with maximum efficacy and speed. ^{1,2,3,4}
Antiseptics	Antimicrobial substances that are applied to the skin to reduce the number of micro-organisms. Examples include topical alcohols, chlorhexidine, triclosan and iodine. ³
Aseptic technique	Aseptic technique is the method employed to prevent transmission of micro-organisms, to protect patients from healthcare associated infections and staff from contamination with the patient's blood, body fluids and toxic substances. ⁵
Attending Medical Officer (AMO)	The medical officer primarily responsible for the clinical care of the patient/client for the episode of care. The AMO is responsible for ensuring that adequate standards of medical documentation are maintained for each patient/client under their care. ⁶
Bloodstream infections (BSIs)	The presence of live pathogen(s) in the blood, causing an infection. ⁷
Clinician	For the purpose of this Guideline a clinician is defined as a medical practitioner, registered nurse or midwife, endorsed enrolled nurse, assistant in nursing, qualified paramedic, radiographer, anaesthetic technician, pathology collector or student in any of those fields.
Competent/Trained	For the purpose of the guideline, a competent clinician is one who has completed a training program in the insertion of PIVCs or who is in, or has completed, a specialist medical training program.
Decontaminate	Use of physical or chemical means to remove, inactivate, or destroy pathogens on a surface or item so that they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal. ⁸

Escalation	A inexperienced clinician who fails to cannulate a vein after two attempts should escalate the procedure to an experienced clinician. ⁶
Experienced clinician	A clinician who has completed a training program in the insertion of PIVCs or who is in, or has completed, a specialist medical training program and has inserted a considerable number of PIVCs. Experienced clinicians are not necessarily more senior clinicians; they may be colleagues such as an RN or JRMO.
Healthcare associated infection (HAI)	Infection acquired in a healthcare facility or an infection that occurs as a result of a healthcare intervention and which may manifest after the patient is discharged from the healthcare facility. ⁷
Healthcare facility	For the purpose of this Guideline, a healthcare facility is any facility or service that delivers healthcare services. Healthcare facilities include hospitals, multi-purpose services, aged care facilities, emergency services, ambulatory care services, Aboriginal Medical Services, community health services, ambulance stations and community based health services such as needle and syringe programs.
IIMS	Incident Information Management System. ⁹
Inexperienced clinician	A clinician who has completed a training program but is still gaining clinical experience and confidence in the insertion of PIVCs.
Multiple passes	More than one pass with a PIVC at the same insertion site.
Pass	Each insertion of the PIVC that pierces the skin and enters a peripheral vein.
Peripheral Intravenous Cannula (PIVC)	For the purpose of this Guideline a device that is designed to be inserted into and remain within a peripheral vein (excludes peripherally inserted central line catheters).
Personal Protective Equipment (PPE)	Refers to a variety of protective barriers used alone, or in combination, to protect mucous membranes, skin, and clothing from contact with recognised and unrecognised sources of infectious agents in healthcare settings. ³
Public health organisation	For the purpose of this Guideline a public health organisation is: <ul style="list-style-type: none"> • Local Health District/Network; • Ambulance Service • Statutory health corporation that provides inpatient services; or • Affiliated health organisation in respect of its recognised establishments that provide inpatient services.⁶
Safety engineered device	An invasive device that has been designed with built-in safety features that reduce the risk of injury. Examples include devices such as syringes with guards, sliding sheaths, shielded, blunting or retracting needles, blunt suture needles and surgical blades with protective covers. ⁸
Should	Indicates a recommended action that should be followed unless there are sound reasons for taking a different course of action. ¹⁰
Staff	For the purpose of this Guideline, staff refers to any person working in any capacity within NSW Health, including contractors, students and volunteers.
Untrained clinician	A clinician who has not completed a training program in the insertion of PIVCs or who is not in or has not completed a specialist medical training program.

2 REQUIREMENT FOR A PERIPHERAL INTRAVENOUS CANNULA

2.1 PIVC insertion requirement

A PIVC should only be inserted by competent/trained clinicians or clinicians under direct supervision of an experienced clinician.

2.2 Other factors to consider

- 2.2.1 Ensure that a PIVC is required, alternatives have been considered and that benefits outweigh risks, by consulting the relevant Medical Officer prior to insertion.
- 2.2.2 Remove PIVCs as soon as they are no longer clinically required.^{11,12}
- 2.2.3 Trained clinicians should keep written evidence of training and competence so that it can be produced when transferring to other health services.
- 2.2.4 Develop and implement escalation procedures to minimise patient harm: e.g. when difficulty arises during insertion of a PIVC that requires multiple passes and a more experienced clinician is not available, or when complications arise and the patient deteriorates. Each facility should nominate who should be contacted during an escalation.
- 2.2.5 An inexperienced clinician should make no more than two attempts at cannulation, except during an emergency or when an experienced (not necessarily more senior) clinician is not available (refer to local escalation policy).
- 2.2.6 When repeated or prolonged administration of chemical irritants, such as potassium chloride or vancomycin, is required, central venous access should be considered, to avoid peripheral vein damage^{11,12}
- 2.2.7 In-line filters are ineffective and not recommended to reduce the risk of infection.¹²
- 2.2.8 Local anaesthetics should be used before the insertion of any PIVC, regardless of PIVC size and age of patient.
- 2.2.9 Only "capless" injection sites should be used on PIVCs. Ideally these should be of the split septum type.

3 PATIENT FACTORS

- 3.1 Except in an emergency the following should be done before inserting a PIVC:
- Correctly identify the patient
 - Check whether the patient has allergies to skin disinfectants, e.g. chlorhexidine or iodine, or dressing materials
 - If the patient can respond, confirm their identity, ask about allergies, explain the procedure and obtain their verbal consent.
- 3.2 Select the most appropriate vein for insertion of the PIVC. Points to consider include¹³:
- Size and condition of patient veins
 - Indication for PIVC and expected duration of PIVC
 - Position of patient during any planned procedure(s)
 - Use non-dominant forearm if practical
 - Use basilic or cephalic veins on the posterior (dorsal) forearm if possible

- The metacarpal veins on the dorsum of the hand are easier to visualise but are more liable to clot, difficult to stabilise, and prone to vessel damage
- In patients with renal failure, the use of the anterior (ventral) forearm veins (especially the cephalic vein) should be avoided, as these may be required for fistula formation for dialysis.

3.3 Avoid the use of veins in the following sites, if possible:¹³

- Areas of flexion, e.g. antecubital fossa, or bony prominences
 - Uncomfortable as this requires splinting
 - Vein easily damaged
- Areas below previous cannulation site
 - Vein may be damaged
- Bruised or phlebotic areas
 - Poor venous return
 - Pieces of clot can be dislodged into the system
- A limb with an arteriovenous fistulae or shunt
 - May compromise haemodialysis access
- An arm on the same side as a previous lymph node dissection, mastectomy or affected by cerebrovascular accident
 - Poor venous and/or lymphatic return
- An infected limb e.g. with cellulitis
- Lower limbs
 - Risk of deep vein thrombosis
 - Limits access, patient comfort and mobility.

4 NECESSARY EQUIPMENT

Ensure that all equipment required to insert the PIVC aseptically is available before commencing, including insertion pack, a variety of PIVCs, capless valves, syringes and preparation solutions (refer to [Appendix 2 – Suggested equipment for PIVC insertion](#))

5 PIVC SELECTION^{11,12,13}

- 5.1 The PIVC should be equipped with a safety device with engineered sharps injury protection. The only exceptions to this are devices required for a specialised procedure, for which no safety device is available and after a risk assessment has been done.
- 5.2 The size of the PIVC used should be determined by the intended use (e.g. blood and blood products, drug therapy, hydration etc), the condition of the patient's veins, likely dwell time duration and the insertion site.
- 5.3 The PIVC should be the shortest and smallest calibre that can meet the anticipated clinical need (i.e. operating theatre, trauma, labour). Please refer to [Appendix 3 – Recommended PIVC selection size](#)

6 ASEPTIC TECHNIQUE^{2,8,11,12}

6.1 No touch technique

Touching the insertion site, the shaft or tip of the PIVC or other sterile equipment with non-sterile gloves breaches aseptic technique. To follow aseptic technique, clinicians should avoid touching:

- The insertion site after decontamination
- Sterile parts of the PIVC (i.e. shaft and tip)
- Other sterile equipment.

6.2 Personal protective equipment

6.2.1 Clinicians must perform hand hygiene as set out in the [Hand Hygiene Policy](#)

6.2.2 Gloves should be worn for PIVC insertion after performing hand hygiene. There is debate over the use of sterile versus clean non-sterile gloves for insertion of PIVCs. At this time the evidence for mandating sterile gloves is inconclusive. Individual facilities or local health districts should decide whether to mandate the use of sterile gloves for PIVC insertion based on a risk assessment.¹²

6.2.3 Clinicians should wear protective eyewear when inserting a PIVC due to the risk of a splash injury occurring.^{3,8}

6.3 Skin Preparation^{11, 12, 17}

6.3.1 Remove hair at the insertion site (prior to antiseptic application) if necessary, using clippers (not a razor) to improve adherence of the dressing.

6.3.2 Clean the skin with neutral soap and water if the insertion site is visibly dirty.

6.3.3 Decontaminate the skin using a single-use alcohol-based chlorhexidine gluconate swab ($\geq 0.5\%$ chlorhexidine gluconate in $\geq 70\%$ isopropyl alcohol). Apply antiseptic to cover an area of approximately 5 x 5cm in a side to side or up and down motion with light friction and allow skin to air-dry.

6.3.4 For patients with a history of chlorhexidine sensitivity/allergy,

- use 5% alcohol-based povidone-iodine swab
- $\geq 70\%$ alcohol
- 10% aqueous povidone-iodine (also suitable for patients in whom alcohol is contraindicated).

6.3.5 For short term PIVC

- 70% alcohol solution/swabs should be used (to reduce unnecessary exposure to chlorhexidine) for PIVCs that will be *in situ* for < 24 hours (e.g. patients having day-only procedures) as residual antimicrobial activity is not required.

6.3.6 Allow the antiseptic to air-dry completely before inserting the PIVC; do not wipe, fan or blot the area dry. Note that aqueous solutions take longer to dry.

6.3.7 Do not touch the planned insertion site after decontamination or, if touching is necessary to confirm anatomy, repeat decontamination, as above.

6.3.8 Do not use antimicrobial ointment or creams at the insertion site.

7 INSERTION OF A PIVC

7.1 Follow the steps outlined in [Appendix 4 – PIVC insertion](#)

7.2 If a PIVC is contaminated at any stage during insertion discard it and use a new PIVC.

7.3 PIVC Stabilisation

- 7.3.1 Stabilise the PIVC with adhesive tape to prevent dislodgement. Avoid placing tape on the PIVC-skin junction site
- 7.3.2 Do not place opaque tape directly over the insertion site, which should remain visible for regular inspection without removing the dressing.
- 7.3.3 Do not reinsert a PIVC after it has become dislodged. A new PIVC should be inserted at a new site.

7.4 Dressing the PIVC^{11, 12, 13}

- 7.4.1 Use a sterile, transparent semi-permeable dressing to protect the insertion site from contamination, allow continuous observation of the site and stabilise and secure the PIVC except;
- When the patient is sweating – specialised dressings should be used.
 - When the patient has excessive bleeding or oozing from the PIVC site – use sterile gauze secured with a sterile transparent, semi-permeable dressing
 - When the patient has multiple PIVCs each PIVC should be dressed separately, unless the puncture sites are close together.
- 7.4.2 Regardless of the dressing type, position it so that the PIVC insertion site is well covered and sealed by the dressing.

8 DEVICES TO ASSIST IN IDENTIFYING VEINS¹⁴

- 8.1 Ultrasound machines and other devices may be used to assist with identifying peripheral veins that are not visible or palpable (e.g. in elderly, dehydrated, haematology/oncology patients).
- 8.2 Previous experience and training is required to use ultrasound effectively. If ultrasound probes are used then the probe should be cleaned according to manufacturer's instructions between patients, a sterile covering placed over the probe before use and sterile gel used on the patient's skin.

9 POST INSERTION CARE OF PIVCS

9.1 PIVC review

- 9.1.1 The PIVC should be assessed for patency each time it is accessed for use
- 9.1.2 Nursing staff should formally assess the PIVC at each shift for patency, erythema, tenderness, pain, swelling and dressing integrity, PIVC position. Document the condition of the PIVC site in the patient's health record each shift.
- 9.1.3 Assess the PIVC on transfer between inpatient departments or facilities and document in the patient's health record.
- 9.1.4 Review the PIVC daily to determine whether it is still required and document in the patient's health record. If the PIVC is no longer required (e.g. when the patient is able to take oral fluids or medication), remove it immediately. Nursing staff should contact

the relevant medical officer to discuss change from IV to oral medication, where relevant.

- 9.1.5 Facilities should develop standing orders for the removal of PIVCs (for example after IV medications are ceased or could be replaced by oral).

9.2 Accessing the PIVC or administration set

- 9.2.1 Change administration sets, including all IV tubing, connections and split septum capless valves when the PIVC is resited.
- 9.2.2 Before accessing, decontaminate all injection ports by rubbing vigorously with a 70% alcohol swab (do not use a chlorhexidine-containing solution) and allow to air dry prior to accessing ports (to give an injection or take blood) or attaching add-on lines.
- 9.2.3 When blood or blood products have been infused; change the administration set, including all IV tubing, connections immediately after completion of the infusion or every 12 hours, whichever is first.¹⁵

9.3 Care of administration sets

- 9.3.1 Label all administration sets attached to the PIVC with an intravenous line label in accordance with NSW Policy User applied Labelling of Injectable Medicines, Fluids and Lines¹⁸
- 9.3.2 IV tubing sets may be disconnected for transient, controlled disconnections such as changing IV infusions, removing a sling or sleeve, or access in Operating Theatres.
- 9.3.3 Except for transient controlled disconnections as above, if the IV tubing set is disconnected, replace the entire IV tubing.

9.4 Duration of PIVC Insertions^{12,13,16}

- 9.4.1 PIVCs should not routinely remain in situ for longer than 72 hours. The responsible medical officer should review the PIVC at as close as possible to 72 hours after insertion to determine whether it should be removed or replaced, based on clinical need and risk/benefit analysis. The PIVC should be removed if there are signs of local infection or thrombosis.
- 9.4.2 A PIVC may be retained beyond 72 hours, if there are no signs of inflammation and:
- Replacement is likely to be difficult and the risk is judged to be greater than retention
 - The PIVC is likely to be needed for only another 24 hours or less.
- 9.4.3 If prolonged IV therapy is likely to be required, a peripherally inserted central catheter should be used rather than multiple replacements of PIVCs.
- 9.4.4 Remove PIVCs inserted by the Ambulance Service or without full aseptic procedure (e.g. emergency situation) as soon as practical, within 24 hours, and replace if clinically warranted.

9.5 Dressing care

- 9.5.1 The PIVC dressing should remain intact for the life of the PIVC unless:
- There is no longer a seal;
 - There is evidence of inflammation; or
 - There is excessive accumulation of blood or moisture.
- 9.5.2 Sterile gauze and dressing should be changed daily and whenever loose, soiled, or moist.
- 9.5.3 If the PIVC dressing needs to be changed¹²:
- Perform hand hygiene
 - Use aseptic technique including sterile dressing pack, drape and gloves
 - Remove blood or ooze from insertion site with sterile 0.9% sodium chloride
 - Decontaminate the area with $\geq 0.5\%$ chlorhexidine and alcohol (over an area slightly larger than the final dressing) for at least 30 seconds and allow to air dry prior to applying the new sterile dressing (do not wipe or blot).

9.6 Patient Education

Educate the patient to:

- Not touch the insertion site or dressing
- Keep the site dry and minimise excessive movement whilst the PIVC is *in situ*
- Notify staff if pain, swelling or redness at the PIVC site is experienced.

9.7 Flushing PIVCs¹¹

- 9.7.1 Where possible, PIVCs should have a continuous flow of IV fluids through them.
- 9.7.2 Where a continuous flow is not possible then the PIVC should be flushed:
- After the PIVC is inserted to confirm correct placement
 - Before each medication/infusion is given (to ensure the PIVC is still patent)
 - After each injection/infusion (to remove irritant material from the vein)
 - After blood sampling (to clear the cannula of blood)
 - At least every 8 hours if not otherwise used (note: consider if the PIVC needs to stay in).
- 9.7.3 Perform hand hygiene before accessing the PIVC or tubing.
- 9.7.4 Scrub the tubing access port with a 70% alcohol swab or solution (do not use a chlorhexidine-containing solution) and allow to air-dry before accessing the tubing or connecting new tubing.
- 9.7.5 Points to note when flushing PIVCs:
- Use sterile 0.9% saline
 - Use a Luer-lock 10ml syringe (which helps avoid excessive pressure)
 - Do not use excessive force
 - Use aseptic technique at all times.
- 9.7.6 The flushing solution and flushing intervals should be either ordered on a medication chart or given according to facility standing order.

9.8 Blood collection via the PIVC

- 9.8.1 Blood may be drawn from a PIVC directly after insertion, but not at other times unless the PIVC has been inserted for the purpose of blood collection.

10 DOCUMENTATION

- 10.1 Each facility or local health district should determine where PIVC assessments are to be documented in the patient's health record and to do so consistently so they can be easily accessed.
- 10.2 The date/time the PIVC was inserted along with the size and site of insertion should be documented in the patient's health record.
- 10.3 Place an IV insertion sticker on the external transparent dressing of the PIVC so that it is visible but will not interfere with assessing the PIVC site.
- 10.4 Documentation in the patient's health record for all PIVCs:
- Condition of the PIVCs at every shift
 - Result of daily PIVC review – that the PIVC is still required or should be removed
 - Any complication such as infection, injury, loss of patency (including if the complication was reported in IIMS - see below)
 - Date and time of PIVC removal; condition of site at the time of removal; and whether cannula and tip were complete and intact.
- 10.5 The daily PIVC review is to be documented in the patient's health record.
- 10.6 Report significant local and PIVC-related site infection or injury, as required, in the Incident Information Management System (IIMS).
- 10.7 Report all PIVC-associated bloodstream infections in IIMS as at least a SAC 2. Notify the Attending Medical Officer and Infection Prevention and Control Professional (ICP) and document in the patient's health record.

11 REMOVAL OF THE PIVC

- 11.1 Perform hand hygiene and don non-sterile gloves and eyewear.
- 11.2 Clean site thoroughly with $\geq 70\%$ alcohol and allow to air-dry.
- 11.3 Withdraw the cannula and apply digital pressure with sterile gauze until haemostasis is achieved.
- 11.4 Inspect the PIVC to ensure the whole device was removed and none has been retained in the patient.
- 11.5 Cover the site with a transparent dressing. Sterile gauze can be used under the dressing if bleeding or discharge continues. Remove the dressing after 24 hours or, if the patient is discharged sooner, instruct the patient to remove the dressing.

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- 11.6 Observe the PIVC site for 48 hours after removal to detect post-infusion phlebitis. If the patient is discharged within that period advise the patient who to contact if pain, swelling, discharge or bleeding at the site or systemic symptoms of infection develop.
 - 11.7 Routine culturing of PIVC tips is not recommended unless infection is suspected.
 - 11.8 Tell the patient to notify staff if any swelling or discharge occurs at the insertion site after the PIVC is removed.
 - 11.9 Document the removal in the patient's health record including the time and date; if the PIVC was intact, whole and included the tip; and the condition of the site post removal.

APPENDIX 1 – COMPLICATIONS AND SUGGESTED MANAGEMENT

Complication	Cause	Action
Insertion site infection – pus noted at the insertion site. Site is swollen, inflamed, red and warm to touch. Patient may be febrile.	Bacterial infection.	<ul style="list-style-type: none"> • Stop infusion immediately, remove PIVC, elevate limb. • Culture the tip of the PIVC. • Inform MO. • Document in IIMS.
Erythema – redness of the skin surrounding the PIVC site. Tip - erythema disappears on finger pressure.	Can be caused by infection, inflammation or injury.	<ul style="list-style-type: none"> • Check PIVC is patent, continue therapy but check PIVC every 4 hours. • Check, with patient, whether there is any pain • Check medication therapy of patient.
Bruising – blue to black skin discoloration around the PIVC site.	Extravasation of blood into surrounding tissue.	<ul style="list-style-type: none"> • Check whether the PIVC has tissue; if so remove it. • Inform MO.
Tissued PIVC - Swelling of tissue proximal to the end of the PIVC	IV fluid infiltration in surrounding tissue.	<ul style="list-style-type: none"> • Stop infusion immediately, remove PIVC, elevate limb. • Inform MO.
Infusion not running	IV solution has run out.	Check IV solution
	Volumetric pump has failed or volume limit reached	Check volumetric pump
	Volumetric pump set removed from pump (automatic off)	Put set back into volumetric pump.
	Roller clamp closed on infusion line.	Check all roller clamps
	Kinked IV tubing.	Check IV tubing is secured and without kinks.
	Patient position – PIVC occluding against venous valve in current patient position.	Check patient position and reposition arm.
	Clot in capless valve.	<ul style="list-style-type: none"> • Change split septum capless valve and attempt to flush. • Do not force flush if resistance felt.
	Clot in PIVC.	Remove PIVC.
Leaking PIVC	Loose connections between PIVC and administration sets or capless valve.	<ul style="list-style-type: none"> • Check all connections are secure. • Flush with 10mL 0.9% sodium chloride and observe for site of leak. • Change lines/connections.
Blocked or tissued PIVC	Clot(s) in valve or PIVC.	Remove PIVC.
Blood under transparent occlusive dressing	Insertion trauma or skin tears.	<ul style="list-style-type: none"> • Remove dressing to check cause of bleeding. • Reapply dressing aseptically.
Patient complaining of pain/ burning at PIVC site	Device not secured properly and causing irritation against the vein wall.	<ul style="list-style-type: none"> • Check PIVC and tubing are securely attached to patient. • Inspect for signs of local infection; remove PIVC if present.
	Early signs of infection.	<ul style="list-style-type: none"> • Inform MO.

APPENDIX 2 – SUGGESTED EQUIPMENT FOR PIVC INSERTION

- Appropriate PPE, including gloves and eye protection
- PIVC - selection based on clinical and patient factors (Appendix 3)
- Cleaned procedural trolley
- Sterile dressing pack or IV starter pack (if your facility uses them)
- Tourniquet: either a single use disposable or single patient use.
- Antiseptic solution as recommended in Appendix 4
- 0.9% sodium chloride solution 10mL
- Protective sheet
- Appropriate transparent occlusive dressing
- Local anaesthetic (lignocaine 1%)
- Luer-lock 10mL syringe for flush
- Luer-lock 2mL syringe and 30G needle for local anaesthetic
- Skin prep as per Appendix 5
- Split septum capless valve
- Sterile gauze squares
- PIVC insertion sticker
- Sharps disposal bin.

It is the responsibility of the clinician inserting the PIVC to ensure items have not passed their expiry dates and that the integrity of the packaging has been maintained.

APPENDIX 3 – RECOMMENDED PIVC SELECTION SIZE¹³

PIVC Size	
14G	Trauma patients Rapid, large-volume replacement
16G	Trauma patients Major surgery Intra-partum or post partum GIT Bleeding Multiple line access Multiple blood transfers High volume of fluids
18G	Blood products Delivery of irritant medications Multiple line access Large volume of fluids Major surgery
20G	General use IV maintenance IV antibiotics IV analgesia
22G	Small or Fragile veins Cytotoxic therapy

Selecting an appropriate site

- Start distally in the upper extremities
- Choose firm, round, elastic, well filled veins
- Assess the length of the vein
- Inspect and palpate for problems
- Look at or ask the patient for their previous history of cannulation (if possible)

APPENDIX 4 – PIVC INSERTION – SUMMARY

Steps for peripheral line insertion
1. Ensure a PIVC is indicated.
2. Obtain a mobile sharps bin and a procedural trolley. Clean the procedural trolley surface.
3. Collect all required equipment.
4. Where possible, introduce yourself to the patient, verify identity, explain the procedure and obtain verbal consent. Check for allergies, e.g. to tape, iodine or chlorhexidine.
5. Remove wrist and hand jewellery, roll up long sleeves to the elbow.
6. Perform hand hygiene.
7. Open dressing/IV starter pack, establishing aseptic field; place sterile equipment onto field.
8. Position patient to ensure best access to site; ensure adequate lighting. Position procedural trolley for easy access and the sharps bin to allow for immediate sharps disposal (to prevent injuries).
9. Inspect and assess the site for the PIVC (if the site is visibly dirty clean with soap and water prior to decontamination) and decide on the type, size and length of the PIVC.
10. Place a tourniquet around the limb proximal to where the PIVC is to be inserted.
11. Inspect and assess the insertion site again.
12. To further dilate the vein if required <ul style="list-style-type: none"> • The patient can assist by clenching their fist • Stroke or tap the vein with your fingers (only before skin disinfection) • Allow the arm to hang over the side of the bed • Apply a warm compress to the area before skin decontamination.
13. Perform hand hygiene
14. Don gloves.
15. Thoroughly decontaminate skin with $\geq 0.5\%$ chlorhexidine in 70% alcohol (or $\geq 70\%$ alcohol if the PIVC is to remain in for < 24 hrs), swab with side-to-side or up and down motion with light friction; allow to air dry. Do not touch site once it has been prepared.
16. In conscious patients, administer lignocaine 1% to the insertion site and wait 15-30s for it to take effect.
17. Using the thumb of the non-dominant hand stretch the skin distal to the vein in order to apply counter traction and steady the vein.
18. Insert PIVC according to the manufactures' guidelines. Be aware that each manufacturer has a slight variation for each PIVC for insertion.
19. Entry into the vein is signalled by a flashback of blood.
20. Hold needle steady and advance PIVC up the vein.
21. Release tourniquet.
22. Apply pressure to skin over tip of PIVC to prevent blood spillage while needle is completely removed. It is the responsibility of the operator to safely dispose of sharps.
23. Attach capless valve.
24. Apply transparent occlusive dressing to ensure secure fixation and write date of insertion on dressing or apply PIVC insertion sticker.
25. If a blood sample is required aspirate the required amount via the capless valve and transfer into required vacutainers.
26. Flush PIVC with 10mL of 0.9% sodium chloride.
27. Attach correctly labelled administration set if commencing continuous infusions.
28. Dispose of equipment into waste containers, remove gloves; perform hand hygiene.
29. Document in patient's health record: date, time, site of insertion; person who performed insertion.
30. If an inexperienced clinician has not inserted PIVC after two attempts, assistance from an experienced clinician (where possible) should be sought or local escalation policy followed.

APPENDIX 5 – ANTISEPTICS^{11, 12, 17}

In order of effectiveness:

1. Chlorhexidine 2% in $\geq 70\%$ alcohol where available (unless contraindicated, e.g. flammability issues or where the PIVC is only to stay in for < 24 hours).
2. Chlorhexidine 0.5-1% in $\geq 70\%$ alcohol may also be used.
3. Chlorhexidine 2% in water (allow to air dry before beginning insertion). 1% aqueous chlorhexidine may also be used.
4. Povidone Iodine 10% in $\geq 70\%$ alcohol (allow to air dry before beginning insertion).
5. Povidone Iodine 10% in water (allow to air dry before beginning insertion).
6. $\geq 70\%$ alcohol (allow to air-dry before beginning insertion) (note: should be used where the PIVC is only to stay in for < 24 hours)

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Sent: Monday, 1 July 2013 12:07 PM
To: ce@lists.health.nsw.gov.au; Mike Rillstone; Nigel Lyons; HGray@heti.nsw.gov.au; rhamm@doh.health.nsw.gov.au; Kerry CHANT; kwhel@doh.health.nsw.gov.au; Karen CRAWSHAW; Elizabeth Koff (SCHN)
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Subject: Draft Guideline for Peripheral Intravenous Cannula (PIVC) Insertion and Post Insertion Care in Adults Patients
Attachments: Draft PIVC Guideline_2013-07-01.pdf; PIVC Guideline Feedback Form.docx; Memo to CEs - Draft PIVC Guideline.pdf

Dear Chief Executives, Directors of Clinical Governance and Deputy Directors-General

Please find attached the memorandum from Professor Clifford Hughes regarding the Guideline for PIVC Insertion and Post Insertion Care in Adult Patients.

Kind regards,

Elisa Banayos

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