Government of **Western Australia**
Department of **Health**
Public and Aboriginal Health Division

Communicable Disease Control Directorate
Guideline

Insertion and Management of Peripheral Intravenous Cannulae in Healthcare Facilities

Guideline 0009 / March 2023

These guidelines have been released by the Communicable Disease Control Directorate, Public and Aboriginal Health Division, Western Australian Department of Health, to provide consistent and evidence informed advice to agencies involved in the prevention of infections and management of communicable diseases in Western Australia.

ACKNOWLEDGEMENT OF COUNTRY AND PEOPLE

The Communicable Disease Control Directorate at the Department of Health acknowledge the Aboriginal people of the many traditional lands and language groups of Western Australia. We acknowledge the wisdom of Aboriginal Elders both past and present and pay respect to Aboriginal communities of today.

Contents

1. Definitions / Acronyms

Term	Definition
Antiseptics	Antimicrobial solutions that are applied to the skin to reduce the number of micro-organisms e.g. alcohol, chlorhexidine, iodine.
Aseptic technique	A technique during invasive clinical procedures that aims to prevent microorganisms on hands, surfaces and equipment being introduced to susceptible sites.
Attempt	The number of times a HCW punctures the patient's skin for the purpose of peripheral intravenous cannulation.
Bloodstream Infection (BSI)	The presence of live pathogen(s) such as bacteria in the blood, causing an infection.
Competency	Refers to a satisfactory standard of ability based on completion of a relevant training program, and current experience and expertise in PIVC insertion. A competent HCW is not necessarily more senior and may be a registered nurse, midwife or junior medical officer.
Disinfection	A process that reduces the number of pathogenic microorganisms to a level at which they are not able to cause harm.
Extravasation	Infiltration of fluid into the surrounding tissue, having the potential to cause 'chemical' burns, necrosis and tissue damage e.g. inotropes, chemotherapy agents, parenteral nutrition and some antimicrobials.
Healthcare associated infection (HAI)	An infection that occurs in a healthcare facility or as a result of a healthcare intervention and may manifest after the patient is discharged from the HCF.
Healthcare worker (HCW)	Any registered medical doctor, nurses and midwives, allied health professionals, dental professions, or a student in any of those fields, as well as professionals from other health sciences
Intravenous therapy	The infusion of solutions and medications directly into a vein.
Peripheral intravenous cannula (PIVC)	A device that is designed to be inserted into and remain within a peripheral vein, excludes peripherally inserted central line catheters.
Peripheral intravenous assessment score (PIVAS)	A validated tool for evaluating and documenting the status of PIVC sites.
Phlebitis	Inflammation of the vein.
Scope of practice	The extent of an HCW's approved clinical practice within a particular organisation, based on the HCW skills, knowledge, performance and professional

	suitability, and the needs and service capability of the organisation.
Standard Precautions	Are the minimum work practices that HCWs must use at all times for all patients to minimise the risk of transmitting infection.
Thrombophlebitis	Phlebitis (vein inflammation) in association with thrombosis (blood clot) of the vein.

2. Purpose

The purpose of this Guideline is to describe the requirements for the insertion and management of peripheral intravenous cannulae (PIVC) to minimise the risk of infection to patients associated with the insertion of a PIVC.

This Guideline has relevancy to all healthcare facilities (HCFs) in Western Australia (WA) and is a related document to MP 0038/16 *Insertion and Management of Peripheral Intravenous Cannulae in Western Australian Healthcare Facilities Policy.* Therefore, the requirements described in this Guideline are mandatory for WA Health Service Providers.

3. Introduction / Background

PIVC provide direct access to the patient's bloodstream and therefore pose a serious risk for infection from microorganisms introduced either at the time of insertion or while the cannula is in situ. PIVC related infections are associated with increased morbidity and mortality, prolonged hospital stays and additional healthcare costs. Infections associated with PIVC are considered preventable adverse events.[1-4]

Data from Healthcare Infection Surveillance WA (HISWA) consistently shows the majority of healthcare associated *Staphylococcus aureus* bloodstream infections (HA-SABSIs) occur as a result of intravascular devices (IVD), with a large percentage of these attributable to PIVCs [5]. This is despite the availability of clinical practice standards, policies and guidelines currently in place within WA HCFs and supports the need for state-wide standardised practices to minimise the risk of PIVC complications [6].

Prevention of PIVC related complications requires a combination of processes including avoiding unnecessary cannulae insertions, strong clinical governance in relation to provision of training and education and support for infection prevention practices utilised during insertion and management of these devices.

4. Requirements (of the Guideline)

All HCFs within WA Health system are to align their local policies and procedures for the insertion and management of PIVCs with this Guideline to ensure a standardised level of

care to minimise the risk of patients developing infective complications from PIVC. The following are considered key requirements for the safe insertion and management of PIVC. Specific requirements for neonates and paediatric patients are described in section 4.3.

4.1 Roles and Responsibilities

Executive Directors of each HCF are responsible for ensuring:

- Development of policies outlining the competency and assessment required for HCWs for insertion and management of PIVCs, relevant to their scope of practice and how competency will be monitored in accordance with this Guideline [7].
- HCWs involved in choosing insertion sites are adequately trained and know how to select the most appropriate PIVC and insertion site for the patient's intended therapy [7].
- the local policy describes the minimum documentation requirements that should include information about inserting, maintaining and removal of PIVC and reviewing the insertion site [7].
- equipment is available at the point of care to ensure that hand hygiene and aseptic technique are maintained every time the PIVC is reviewed, accessed or flushed [7].
- the local policy describes the need for at least daily review of ongoing need for IV access and for immediate removal of PIVCs when they are no longer needed [7].

Healthcare workers (HCW) are responsible for ensuring:

- they undertake appropriate training and education in insertion and management of PIVC as specified by their HCF that is relevant to their scope of practice, and that they are assessed as competent in using and adhering to the current, evidence-based practices to preserve vessel health and prevent complications associated with using a PIVC [7].
- they comply with standard precautions, including the application of the 5 moments for hand hygiene and adhering to aseptic technique when inserting or accessing a PIVC and the safe use and disposal of sharps at all times [8].
- insertion and management of PIVCs is in accordance with this Guideline and local HCF requirements.
- they seek assistance from a more experienced HCW after two unsuccessful attempts. Where this is not possible the HCW must assess the risk of further attempts against the risk of a delay in treatment. Consider the use of ultrasound guidance to locate veins.
- all documentation requirements are undertaken in accordance with this Guideline.

4.2 Insertion and Management of PIVC

4.2.1 Pre-insertion considerations

- A PIVC is only to be inserted if deemed clinically necessary and other alternatives are not an option, e.g. oral medication [7].
- If venous access is required, ensure the most appropriate venous access device is chosen e.g. when repeated or prolonged administration of vesicant or irritant solutions, such as potassium chloride, flucloxacillin or vancomycin, is required, central venous access should be considered, to avoid peripheral vein damage[9].
- The use of local anesthetic, such as subcutaneous lignocaine or EMLA cream to reduce the pain of insertion, should be considered before the insertion of any PIVC, regardless of PIVC size and age of patient and offered to adults unless contraindicated e.g. use of the PIVC for vesicants or irritant solutions [10-12].
- EMLA cream can leave a lipid residue that may create a focus for microbial growth therefore prior to skin decontamination residual topical anaesthesia should be removed with soap and water (13).
- Prior to insertion, HCWs are to confirm patient identity and obtain verbal consent in accordance with local HCF policy and IV-WISE[7] Appendix A patient education tool is to be used to advise their role and involve them in their care to prevent PIVC related complications.

4.2.2 PIVC device selection

- The use of PIVC that are classed as safety-engineered medical devices (SEMDs) is preferred to reduce the risk of injury involving a sharp[7]. The exceptions to this are PIVC required for specialised procedures for which no SEMD is available or where the use of a SEMD interferes with provision of care.
- The size of the PIVC is to be determined by the intended use, e.g. hydration, blood products, the condition of the patient's veins and the insertion site. The PIVC is to be the shortest and smallest gauge that is suitable for the anticipated clinical need (refer Appendix B).[14]
- All PIVC are to have an extension set attached, e.g. j-loop, except for those PIVC utilised for short stay therapy in an outpatient, emergency or procedural setting, where the use of a needleless valve is acceptable. Extension sets help maintain stability and reduce trauma to the vein.

4.2.3 PIVC site selection

- PIVC are to be routinely sited in the distal areas of the upper limbs. Subsequent PIVC are to be inserted, where possible, proximal to the previous site. Select the most appropriate vein for insertion of the PIVC with consideration of
    - indication and expected duration of PIVC
    - size and condition of patient's veins
    - position of patient during any planned procedure(s)
    - utilising the patient's non-dominant forearm if practical.
    - utilising basilic or cephalic veins on the posterior (dorsal) forearm if possible.
- If possible, avoid the use of veins in the following sites:
    - the anterior (ventral) forearm veins, especially the cephalic vein, in patients with chronic renal failure, as these may be required for fistula formation for dialysis
    - areas of flexion, e.g. antecubital fossa, or bony prominences due to increased risk of BSI and discomfort for the patient
    - areas below previous cannulation sites bruised or phlebitic areas due to poor venous return and possibility of clots being dislodged
    - a limb with an arteriovenous fistulae or shunt as this may compromise access for haemodialysis
    - an arm on the same side as a previous axillary clearance, mastectomy or affected by a cerebrovascular accident
    - an infected limb, e.g. with cellulitis, due to increased risk of infection
    - a limb with a PICC or implanted venous access device
    - lower limbs due to risk of deep vein thrombosis, reduces access, patient comfort and mobility.[12]

4.2.4 Prophylactic antimicrobials

Prophylactic antibacterial or antifungal agents (topical, oral, intranasal, or parenteral) are not recommended to prevent catheter colonisation or BSI [13, 15].

4.2.5 Standard precautions and aseptic technique

- A risk assessment is to be carried out to identify the standard precautions required to safely perform the procedure [7].
- Hand hygiene consistent with the '5 Moments for Hand Hygiene' with antimicrobial hand wash solution and water or using an alcohol-based hand rub immediately prior to the insertion of PIVC [7].

- Aseptic technique is always to be utilised during the insertion and ongoing management of the PIVC [7, 16].
- A sterile PIVC starter pack or sterile dressing pack and associated sterile equipment are to be used to insert all PIVC.
- Gloves are to be utilised for insertion of a PIVC. For most insertions, non-sterile gloves are adequate.
- Sterile gloves are recommended to be worn to maintain asepsis during insertion:
    - if there is a risk of contamination of the skin prepped area by re-palpation after skin disinfection
    - when the HCW inserter is a novice practitioner [7, 16]
    - the procedure is anticipated to be technically challenging including use of complex insertion techniques (e.g. Seldinger) [17]
    - when connecting the hub of the cannula to the extension set if there is a risk of contaminating key parts. [7, 16]

4.2.6 Skin preparation

- Use clippers to remove hair at the insertion site if necessary.
- Clean the skin with neutral soap and water if the insertion site is visibly soiled.
- Perform skin disinfection using 2% chlorhexidine gluconate in 70% isopropyl alcohol solution, except in the case of documented allergy or in neonates [7]. Liberally swab a large area of skin around the chosen insertion site to ensure the site for the dressing is also disinfected.
- Allow skin antiseptic to air dry to ensure adequate contact time. Do not wipe or blot skin 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.

4.2.7 Securement and dressing management

- Use a sterile, transparent semi-permeable dressing to secure the PIVC, extension set, or needleless valve if short stay device, to stabilise and secure the PIVC, allow continuous observation of the site and protect the insertion site from contamination.
- 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.

- The insertion site should remain visible for inspection, therefore, do not place opaque tape directly over the insertion site.
- Record the date and time of insertion and the signature of the inserter on the adhesive strip of the IV dressing.
- 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 or dislodged, the PIVC is to be removed and a new PIVC inserted as soon as practical [13].

4.2.8 PIVC assessment

- Once per shift (or per eight hours) or when clinically indicated inspect the PIVC and insertion site for signs of complications that can lead to device failure and remove the PIVC as soon as it is no longer required [7].
- All PIVCs are to be assessed for patency and for any signs of complication each time the device is accessed and determine if the patient is tolerating their PIVC and their understanding of the need for the device [7].
- More frequent inspections may be required from some patients. In particular inspect
    - for signs of pain, swelling or redness at the insertion site, by visual inspection through the transparent dressing and gentle palpation through the dressing
    - the condition of the patient's veins, and whether they have become hardened or thrombosed
    - for signs of localised or systemic infection; if either are confirmed, report in an incident management system
    - for leakage of fluid from the insertion site, signs of occlusion, infiltration or extravasation
    - whether the PIVC remains appropriately dressed and secured.[7]
- All PIVC are to have a peripheral intravenous assessment score (PIVAS) performed each shift or at least every eight hours while the PIVC is insitu and continued for 48 hours post removal. Any PIVC site issues are to be documented in the patient's medical record (refer to Appendix C).

4.2.9 PIVC blood collection

- Blood samples 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, 14, 18]

- Except in neonates, infants and children (refer to section 4.3.9) collection of blood cultures at time of insertion of a PIVC is not encouraged due to the increased risk of contamination at the time of collection. If the procedure is performed, a second set of blood cultures collected by venepuncture are to be collected. [18, 19]

4.2.10 Needleless access ports

- As closed intravenous access systems are associated with fewer BSIs than open systems, needleless access ports are to be used on all lumens [9]. Stopcocks are to be end-capped with a needleless access port when not in use.
- All PIVC access ports are to be disinfected by rubbing with a single-use 70% alcohol-impregnated swab and allowed to dry prior to accessing the system. 70% alcohol has significant and immediate antimicrobial activity and reduces unnecessary exposure to chlorhexidine as the residual activity of chlorhexidine is not required on inanimate surfaces. [9, 15, 20, 21]
- All access ports are only to be accessed with a sterile single-use device.
- When an access port is removed from a PIVC or extension set, it is to be discarded and a new sterile access port attached.

4.2.11 Management of administration sets

- Administration sets, including all tubing, connections, extension 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 (24).

4.2.12 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 5-10mls 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.
- HCWs 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 (refer to section 4.2.9) PIVC blood collection
    - 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, HCWs must clamp the extension set or withdraw the syringe while administering the last 0.5 ml of flush (positive pressure technique).

4.2.13 Duration and re-siting of PIVCs

- All PIVC inserted by ambulance or other emergency services are to be removed as soon as the patient's condition has stabilized or within 24 hours of insertion and only replaced if clinically indicated [7].
- 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.
- Any patient with a PIVC following inter-hospital transfer, is to have their PIVC assessed for clinical need, the time in situ and a PIVAS assessment undertaken. Actions should be directed based on findings. If unable to determine adequate information the PIVC should be removed and re-sited if ongoing need.

- All PIVC are to be reviewed daily or when clinically indicated, for ongoing need and removed as soon as no longer required and are not to remain in situ longer than 72 hours [9, 14, 16, 21].
- Exception to 72-hour re-siting is for those patients with known difficult intravenous access (DIVA), extended dwell time of the PIVC is clinically required and the PIVAS and clinical assessment supports retention of the PIVC. This must be determined by the treating team and clearly documented in the patient medical record.
- The responsible medical officer is to review the need for PIVC access daily, and if ongoing access is required past 72 hours, planned re-siting of the PIVC is to occur.
- Remove the PIVC if PIVAS is 2 or greater, or fever >38°C, or signs of sepsis are evident.
- If prolonged IV therapy is likely to be required, consideration for a central catheter, either peripherally or centrally inserted, or a long peripheral venous catheter (also referred to as a 'midline' catheters) should be utilised rather than multiple replacement of PIVCs.
- If extravasation occurs special precautions are required prior to removal of the PIVC. Refer to local HCF guidelines.
- Routine culturing of PIVC tips is not recommended unless infection is suspected.

4.2.14 Removing the PIVC if infection 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 occurs 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, in accordance with the HCF incident reporting processes and *MP 0122/19 Clinical Incident Management Policy*[25].

4.2.15 Documentation requirements for PIVC

- 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. Each HCF can determine

site specific documentation, however, examples are provided in Appendix B and C that meet the requirements of this Guideline.

- For each PIVC inserted, the documentation is to include date and time of insertion, anatomical site of insertion and the name of the HCW inserting the PIVC, the removal date and time and the reason for removal e.g. treatment complete, pain, dislodgement, PIVAS 2 or greater, extravasation, vessel hardness or emergency insertion.
- Documentation is to address if a PIVC has been inserted in an emergency or when there have been failed insertion attempts.
- The use of an IV insertion label, noting date and time of insertion and signature of HCW 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 in situ and for 48 hours following removal to detect post removal complications (Refer Appendix D). 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.

4.2.16 Patient education

- Ensure patients or carers are provided with information in relation to their PIVC and possible complications (refer to IPPSU tools and resources webpage). HCWs are to have a discussion with the patient, when mentally competent, to ensure they understand the information provided to them.

4.3 Neonate and Paediatric Consideration

4.3.1 Definitions

Neonate: infant less than 28 days old	Infant: 1 month to 12 months old
Preterm infant: < 37 weeks gestational age	Child: for the purpose of this document – refers to children aged one to 16 years.
Term infant: >37 weeks gestational age	

4.3.2 PIVC site preferences

It is preferable to utilise veins in the hands and feet and to choose veins that run straight, fill and empty and are easy to splint, although sites such as the scalp in neonates and infants can also be used.

4.3.3 Insertion

Neonates	Infants, children and adolescents
• Standard tourniquets are not used. Occlusion of the vein can be achieved with gentle pressure applied to the vein proximal to the insertion site • SEMDs are generally not used due to the complexity and difficulty of the procedure • A 24g cannulae is to be utilised.	• A single-patient use tourniquet of the appropriate size is recommended. • SEMDs, where available, are recommended to reduce the risk of sharps injury.

4.3.4 Skin disinfection

Neonates	Infants, children and adolescents
• If ≤ 28 weeks gestation utilise povidone-iodine 10% solution and allow to air dry. Remove antiseptic solution with sterile saline or sterile water before proceeding with the procedure. It is recommended to avoid the use of chlorhexidine in extremely low birth weight babies due to the risk of chemical burns.[26, 27] • If > 28 weeks gestation utilise 1% chlorhexidine solution and allow to air dry before proceeding with the procedure. Wash off excess solution after the procedure with sterile water or saline to prevent chemical burns.[26, 27]	• For term infants, children and adolescents 2% chlorhexidine gluconate in 70% isopropyl alcohol can be utilised. • Alternatives as stated for neonates can be used for patients with skin sensitivities. Refer to HCF specific protocols for advice for patients with multiple sensitivities.

4.3.5 Pain Management

Neonates	Infants, children and adolescents
• Non-pharmacological interventions have been shown to be effective for pain management. Recommended practices may include breastfeeding, skin to skin contact, oral sucrose, breast milk, kangaroo care, holding, swaddling, oral sucrose and non-nutritive sucking [28, 29]. Repeated use of sucrose should be used with caution in pre-term infants less than 31 weeks gestation [30].	• Utilise distraction, play therapy, topical anaesthetic, 'Buzzy' device, relaxation, breathing and imagery techniques in accordance with the child's developmental stage and considering previous experiences and anxieties. • Children with severe anxiety and/or needle phobias should be referred to a paediatric psychologist and/or paediatric pain service. Refer to the Child and Adolescent Health Service protocols for procedural pain minimisation techniques

4.3.6 Securement and dressing and management

- The type of securement for the PIVC depends upon several factors, including the condition of the skin, site of the PIVC, mobility of the neonate / child and risk of dermal stripping. When dressing the PIVC ensure the dressing is secure, the site is visible and that the taping is not occlusive or restrictive. Refer to HCF specific policies for dressing application and securement techniques.
- IV boards or splints are recommended to secure PIVC placed in or adjacent to areas of flexion, to immobilise the joint and minimise the risk of venous damage.
- When using a splint, ensure it is positioned and strapped with the limb and digits in a neutral position and the taping is not occlusive or restricting circulation.
- If securing the splint with tape, consider lightly backing any tape with cotton wool or gauze that has contact with skin.
- Consider placing a small piece of cotton wool ball or gauze underneath the hub of the cannula to reduce risk of pressure injury.
- Inspect the splint each shift and change if wet or soiled.

4.3.7 Flushing

- Use pre-prepared 0.9% sodium chloride flush syringes e.g. Posiflush in preference to drawing up sodium chloride with a syringe and needle.

- For neonates, infants and children, use the minimum volume of flush to clear a line and any add-on devices, of fluid, medication or blood (between and after each medication or fluid administration), as follows [31]
    - Neonates: 0.5mL
    - Infant: 2ml
    - Child / Adolescent: 5 - 10mL.
- The IV device should be flushed using pulsatile positive pressure technique.
- PIVCs without a continuous infusion are to be flushed 6 to 8 hourly to ensure patency.

Neonates	**Infants, children and adolescents**
• Use a 2.0mL luer lock syringe. The minimum volume of flush is 0.5ml.	• Flush between and after each medication administration. Consider volumes required to clear administration lines when using infusion pumps (see above for fluid volume guidance per age). • Flush solutions and volumes should be prescribed on the paediatric National Inpatient Medication Chart (refer to site-specific policies).

4.3.8 PIVC assessment

- Inspect the PIVC insertion site at least hourly when a continuous infusion is in progress, and with each intermittent medication and flush administration, ensuring any covering is removed completely to perform an assessment of the insertion site and to observe the limb above and below the site.
- Any adverse findings are to be documented in the patient's medical record.
- PIVAS documentation is to be applied in the neonatal and paediatric settings.
- Increased supervision is required for active infants/young children on continuous infusions due to the risk of entanglement with administration lines.

4.3.9 PIVC blood collection

- Blood samples, including blood cultures, may be drawn from a PIVC directly after insertion, but not at other times.

Neonates	Infants, children and adolescents
• Regular routine blood sampling following PIVC insertion depends on sample volume required and should be via capillary heel prick (for volumes <1ml) or venepuncture (for volumes >1ml). An arterial line should be used for critically ill neonates requiring frequent blood sampling [32].	• If multiple blood samples are required for short term investigative procedures or emergency management a peripheral blood sampling line can be inserted [33].

4.3.10 Duration of PIVC

- PIVC related infections are less prevalent in children than in adults, and due to the difficulty in establishing intravenous access in this population PIVC's are not routinely replaced.
- The PIVC can stay in situ if:
    - a PIVC is clinically indicated
    - there is no evidence of local (redness, pain, tracking) or systemic (fever and rigors) signs of infection
    - is still flushing well without resistance or leakage from the insertion site.

4.3.11 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, if contamination or accidental disconnection occurs or a blood reaction is suspected [9, 33].

5. Relevant Legislation

Nil applicable

6. Additional Resources

- Australian Commission on Safety and Quality on Health Care (ACSQHC). Management of Peripheral Intravenous Catheters Clinical Care Standard (May 2021).
- National Health and Medical Research Council. Australain Guideline for the Prevention and Control of Infection in Healthcare (May 2019),
- IPPSU Tools and Resources – PIVC Consumer Fact Sheet, 'Your IV Cannula' Poster (Adults)', 'Your IV Cannula Poster (Paediatric)'.

7. Guideline Contact

Enquiries relating to this Guideline may be directed to:

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8. Document Control

Guideline number	Version	Published	Review Date	Amendments
0009	V.2	14/03/2023	14/03/2026	Amendment to recommendation on sterile glove use
0009	V.1	03/10/2022	03/10/2025	Original version

9. Approval

Approved by	Dr Paul Armstrong, Director Communicable Disease Control Directorate, Department of Health
Approval date	14/03/2023

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11. Appendices

Appendix A: IV-WISE patient discussion tool

The IV-WISE patient discussion tool

IV-WISE* lists key discussion points for clinicians and patients, to involve patients in their care and prevent PIVC-related complications:

What clinicians should discuss with patients:	What patients can ask and do:
I Intravenous access needs	
▪ Discuss why IV fluids or medicines are needed ▪ Explain how the PIVC will be inserted ▪ Ask patients about their PIVC history and any current needs.	Tell your healthcare team about your past experiences including: ▪ Difficulty inserting a PIVC ▪ Anything that has worked well ▪ Your preference or any physical problems that could affect where the PIVC is placed ▪ Any allergies you have, such as to tapes and dressings.
V Vascular access checks	
▪ Advise that the PIVC will be checked regularly ▪ Ask patients to report any concerns or any problems they notice (e.g. redness, swelling).	▪ Your clinician will regularly check your PIVC ▪ Tell your clinician if you have any concerns or notice any problems.
W What patients can do to reduce the risk of complications	
▪ Advise patients what they can do to help reduce the risk of PIVC-related complications and infection ▪ Provide patients with the 'Looking after your cannula' information sheet.	To help to look after your PIVC: ▪ Protect the PIVC from knocks or being pulled ▪ Wear loose clothing so that the PIVC does not get caught ▪ Keep the PIVC dry while washing and showering ▪ Ensure that the protective dressing stays in place.
I Infection risk	
▪ Discuss how to prevent infection.	To prevent infection: ▪ Keep your hands clean by washing with soap or using sanitiser ▪ Do not touch, fiddle with, or move the device.
S Signs and symptoms of complications	
▪ Discuss the signs and symptoms to look out for ▪ When removing the PIVC, advise patients that symptoms can occur up to 48 hours later and what to do.	Tell your clinician as soon as possible about: ▪ Redness, pain or swelling at the insertion site ▪ Feeling hot, cold or shivery ▪ Leakage from the device ▪ The dressing getting wet, bloodstained or loose.
E Expected removal	
▪ Tell patients when the PIVC is expected to be removed (e.g. when therapy is finished).	▪ If your PIVC has not been used in the last 24 hours, ask if you still need it ▪ If you are going home and your PIVC is still in place, ask your clinician if it can be removed.

* Developed by the Australian Commission on Safety and Quality in Health Care, 2021.

Appendix B: PIVC Selection

PIVC SIZE	COLOUR	RATIONALE FOR USE
14G	ORANGE	Trauma patients Rapid, large-volume replacement
16G	GREY	High volume of fluids / Trauma patients Major surgery Intra-partum or post-partum / GIT Bleeding Multiple line access Multiple blood transfers
18G	GREEN	Rapid administration of large volumes Blood products / Viscous fluid infusions Delivery of irritant medications Multiple line access Major surgery Imaging requiring power injection of CT contrast
20G	PINK	General use / IV maintenance IV antibiotics IV analgesia
22G	BLUE	Small or fragile veins Paediatric Most types of drug therapy - continuous intermittent or bolus Cytotoxic therapy
24G	YELLOW	Small veins For slow flow rates Neonatal Cancer services

Selecting an appropriate site

- Consider the length of PIVC
- 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 C: Peripheral Intravenous Assessment Score

Peripheral Intravenous Assessment Score (PIVAS) Assess the PIVC site each time it is accessed and ensure a PIVAS is documented each shift		
LOOK Observe the PIVC site for erythema, swelling or exudate. Is the dressing intact, clean and dry?	**LISTEN** Ask the patient or use visual clues. Is there pain or tenderness on infusion / palpation or movement?	**FEEL** Palpate the site through the intact dressing. Is there any heat or vessel hardening?

PIVAS	CLINICAL ASSESSMENT AND INTERVENTIONS **Always use Look, Listen and Feel observations noted above** If patient has limited access or requires extended / vesicant IV therapy, consider alternative vascular access device
0	**Healthy IV site** • No signs of phlebitis • No identified concerns in relation to the ***'Look, Listen and Feel'*** • Replace dressing if not clean, dry and intact.
1	**One of the following is evident:** Pain, tenderness or erythema at IV site. • Discuss with Medical Officer and consider review of infusion rate or further dilution of medications. • Replace dressing if not clean, dry and intact. • **Continue to observe site closely and document each shift**
2	**Two of the following signs or symptoms are evident:** Pain, erythema, swelling, discharge or palpable venous cord. • **Remove PIVC immediately** • Inform Medical Officer and re-site only if required • Document signs and symptoms, PIVAS and actions in patient's medical record • Complete incident notification • Continue to observe and record status of IV site until healed.
A PIVAS of 2 or more with associated fever not explained by other causes requires collection of 2 sets of blood cultures and the PIVC tip sent for culture	
3	**3. Medium stage of phlebitis** ALL of the following are evident: Pain along path of cannula, erythema, induration and palpable venous cord. Also possibly evident: Pus, pyrexia. • **Remove PIVC immediately** and inform Medical Officer • If ongoing IV treatment required consider alternate venous access device e.g. PICC • Document signs & symptoms, PIVAS and actions in patient medical record • Initiate additional treatment as required • Complete incident notification • Continue to observe and record status of IV site until healed. • If discharged from hospital advise GP for review.
4	**4. Advanced stage of phlebitis or start of thrombophlebitis**
5	**5. Advanced stage of thrombophlebitis**

Adapted from: Jackson A (1998) Infection control: a battle in vein infusion phlebitis. *Nursing Times*; 94: 4, 68-71

Appendix D: PIVC Documentation tool

USE PATIENT LABEL WHEN AVAILABLE

URN:

Surname:

Forename:

Gender:

Ward:

DOB:

Check Patient ID and Affix Label

PERIPHERAL VASCULAR CATHETER (PVC) INSERTION AND OBSERVATION RECORD

Assess PIVAS each shift and document PIVAS for duration of PVC and for 48hrs following removal.
Remove PVC if in situ for 72 hrs and inform medical team immediately.

PVC # _____ Insertion Date: ____/____/____ Insertion Time: _____ : _____ hrs

Cannulation site: _____ Patient location when PVC Inserted: _____

☐ Education given to patient Total no. of attempts to insert PVC: _____

Inserted by (Print name and designation): _____

									MUST be removed			48 hour post-removal observations					
Date	___/___/___			___/___/___			___/___/___			___/___/___			___/___/___			___/___/___		
Time	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND
PIVAS																		
Initial																		

Removal Time: _____ : _____ **hrs**

Removal Date: _____/_____/_____

Removed by: Name: _____

Signature: _____

Removal reason: ☐ 72 hrs post insertion
☐ No longer required ☐ Tissued
☐ PIVAS >2 ☐ Patient removed
☐ Other: _____

PIVAS >2 actions required:
☐ 2 sets of blood cultures obtained ☐ CIMS completed
☐ Cannula tip sent to microbiology ☐ PVC site swabs obtained

PVC # _____ Insertion Date: ____/____/____ Insertion Time: _____ : _____ hrs

Cannulation site: _____ Patient location when PVC Inserted: _____

☐ Education given to patient Total no. of attempts to insert PVC: _____

Inserted by (Print name and designation): _____

									MUST be removed			48 hour post-removal observations					
Date	___/___/___			___/___/___			___/___/___			___/___/___			___/___/___			___/___/___		
Time	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND
PIVAS																		
Initial																		

Removal Time: _____ : _____ **hrs**

Removal Date: _____/_____/_____

Removed by: Name: _____

Signature: _____

Removal reason: ☐ 72 hrs post insertion
☐ No longer required ☐ Tissued
☐ PIVAS >2 ☐ Patient removed
☐ Other: _____

PIVAS >2 actions required:
☐ 2 sets of blood cultures obtained ☐ CIMS completed
☐ Cannula tip sent to microbiology ☐ PVC site swabs obtained

Source: Sir Charles Gairdner Osborne Park Health Care Group: Peripheral Vascular Catheter Insertion and Observation Record

This document can be made available in alternative formats on request for a person with disability.