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Communicable Disease Control Directorate Guideline

Insertion and Management of Peripheral Intravenous Cannulae in Healthcare Facilities

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Contents

Contents	1
1. Definitions	3
2. Purpose	6
3. Introduction	6
4. Requirements (of the Guideline)	6
4.1 Roles and Responsibilities	6
4.2 Insertion and management of PIVC	7
4.2.1 Pre-insertion considerations	7
4.2.2 PIVC device selection	8
4.2.3 PIVC site selection	9
4.2.4 Prophylactic antimicrobials	10
4.2.5 Standard precautions and aseptic technique	10
4.2.6 Skin preparation	10
4.2.7 Securement and dressing management	11
4.2.8 PIVC assessment	11
4.2.9 PIVC blood collection	12
4.2.10 Needle free connectors	12
4.2.11 Management of administration sets	12
4.2.12 PIVC flushing	13
4.2.13 Post-insertion of PIVC-duration and re-siting	14
4.2.14 Removing the PIVC if infection suspected	14
4.2.15 Documentation requirements for PIVC	15
4.2.16 Patient education	16
4.2.17 Auditing and surveillance	16
4.3 Neonatal and paediatric considerations	17
4.3.1 PIVC site preferences	17
4.3.2 Insertion	17
4.3.3 Skin disinfection	17
4.3.4 Pain management	18
4.3.5 Securement and dressing and management	18
4.3.6 Flushing	18
4.3.7 PIVC assessment	19
4.3.8 PIVC blood collection	20
4.3.9 Duration of PIVC	20
4.3.10 Management of administration sets	20
5. Relevant Legislation	20
6. Additional Resources	20

7. Guideline Contact	21
8. Document Control	21
9. Approval	22
10. References	23
11. Appendices	26
Appendix A: Peripheral Intravenous Assessment Score (PIVAS)	26
Appendix B: PIVC selection	27
Appendix C: PIVC Insertion and Observation Record	28
Appendix D: PIVC Insertion and Observation Record – DIVA and Paediatric	30

1. Definitions

Term	Definition
Antiseptics	Antimicrobial solutions that are applied to the skin to reduce the number of micro-organisms (e.g. alcohol, chlorhexidine and 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 healthcare worker punctures a 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.
Child	Refers to children aged between one and 16 years for the purposes of this document.
Competency	Refers to a satisfactory standard of ability based on completion of a relevant training program, and current experience and expertise in PIVC insertion and not necessarily seniority.
Disinfection	A process that reduces the number of pathogenic microorganisms to a level at which they are not able to cause harm.
Difficult intravenous access (DIVA)	<p>Defined as a patient that has limited visible and palpable veins and or multiple unsuccessful attempts to insert a catheter. This can be acute due to sudden illness, or chronic resulting from complex medical intervention. Characteristics of DIVA include, but are not limited to:</p> <ul style="list-style-type: none"> - patient characteristics e.g. overweight (BMI greater than 30) or underweight, extremes of age (history of prematurity and older adult), and gender (female) - a stated history or documented history of difficulty obtaining vascular access - a history of drug abuse.
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 as a result of a healthcare intervention and may manifest after the patient is discharged from the healthcare facility.

Healthcare-associated <i>Staphylococcus aureus</i> bloodstream infection (HA-SABSI)	A bloodstream infection caused by the microorganism <i>Staphylococcus aureus</i> and deemed associated with healthcare practices or interventions.
Healthcare worker (HCW)	Any registered medical doctor, registered nurse, midwife or enrolled nurse, anaesthetic technician, phlebotomist, radiologist, radiology service assistant or a student in any of those fields who has met the competency requirement to insert a PIVC.
Infant	One month to 12 months old.
Intravenous therapy	The infusion of solutions and medications directly into a vein.
Neonate	Infant less than 28 days old.
Peripherally inserted central catheter (PICC)	These are central lines that are inserted percutaneously into peripheral veins e.g. basilic, brachial, cephalic and the tip terminates in one of the great vessels near to the heart.
Peripheral intravenous assessment score (PIVAS)	A validated tool for evaluating and documenting the status of peripheral intravenous cannula sites.
Peripheral intravenous cannula (PIVC)	A device that is designed to be inserted into and remain within a peripheral vein, excluding peripherally inserted central catheters and midline catheters.
Phlebitis	Inflammation of the vein.
Phlebotomy	The act of removing blood from the circulatory system.
Preterm infant	Less than 37 weeks gestational age.
Scope of practice	The extent of a healthcare workers approved clinical practice within a particular organisation, based on their skills, knowledge, performance and professional suitability, and the needs and service capability of the organisation.
Safety-engineered medical devices (SEMDs)	SEMDs are medical devices designed with a safety feature to reduce the risk of occupational exposure to blood and body fluids.
Standard precautions	The minimum work practices that healthcare workers must use at all times for all patients to minimise the risk of transmitting infection.
Term infant	Greater than or equal to 37 weeks gestational age.

Thrombophlebitis	Phlebitis (vein inflammation) in association with thrombosis (blood clot) of the vein. This can be caused by mechanical i.e. multiple/frequent PIVC or phlebotomy in the same location or in an area of flexion e.g. ACF, or chemical caused by infusion of irritant IV therapies.
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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 and or other complications to patients associated with the insertion, use and maintenance 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

All 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. Infections related to PIVC are associated with increased morbidity and mortality, prolonged hospital stays and additional healthcare costs. These infections are considered preventable adverse events ¹⁻⁴.

Data from Healthcare Infection Surveillance WA (HISWA) consistently shows most healthcare-associated Staphylococcus aureus bloodstream infections (HA-SABSIs) occur because of intravascular devices, with a large percentage attributable to PIVC ⁵.

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

4. Requirements (of the Guideline)

All HCFs are to align their local policies and procedures for the insertion and management of PIVC with this Guideline to ensure a standardised level of care. This is 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 training and competency assessment required of HCWs for insertion and management of PIVC ⁶.
- those 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 ⁶.

- local policy describes the minimum documentation requirements i.e. date / time of insertion and removal, and the need for at least daily review by the treating medical team of the ongoing need for intravenous (IV) access and immediate removal of PIVC when they are no longer needed ⁶.
- 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 ⁶.

Healthcare workers (HCW) are responsible for ensuring:

- they undertake training 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 adhering to the current, evidence-informed practices to preserve vessel health and prevent complications associated with PIVC ⁶.
- they comply with standard precautions, including hand hygiene consistent with the [5 Moments for Hand Hygiene](#), aseptic technique when inserting or accessing a PIVC, and the safe use and disposal of sharps at all times ⁷.
- insertion and management of PIVC 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 and/or consider the use of ultrasound guidance to locate veins
- when ultrasound probes are used, they must be covered with a sterile probe cover and appropriate cleaning and disinfection must occur after use (refer to [ACSQHS cleaning and disinfection of ultrasound transducers](#))
- 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 appropriate option e.g. oral medication ⁶.
- The need for a PIVC is to be assessed against the DRIP criteria below (refer to [Appendix A](#)) ⁸:



D	Is there a risk of sudden Deterioration ?
R	Is Rehydration needed, are IV fluids required?
I	Are IV medications required?
P	Are Procedures requiring IV access planned?

- if “No” to all the DRIP criteria, alternative management options should be discussed with the medical team before inserting a PIVC
- if a PIVC is in situ and if “No” to all DRIP criteria, remove the PIVC in liaison with treating medical team.
- Phlebotomy alone is not an indication for PIVC insertion.
- If venous access is required, the most appropriate venous access device is to be chosen – for example, 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.
- If the patient has difficult intravenous access (DIVA) they should be escalated to the most experienced local clinician and consideration given for the use of alternative intravascular access or the use of advanced insertion technique, such as the use of ultrasound guidance.
- Patients identified as DIVA can have a medical alert applied in webPAS in accordance with local policy.
- The use of local anaesthetic, such as subcutaneous lignocaine or EMLA cream to reduce the pain of insertion, is to be considered before the insertion of any PIVC, regardless of PIVC size and age of patient, and is to be offered to adults unless contraindicated e.g. use of the PIVC for vesicants or irritant solutions ¹⁰⁻¹². Refer to [section 4.3.5](#) for neonates.
- EMLA cream can leave a lipid residue that may create a focus for microbial growth, therefore residual topical anaesthesia should be removed with soap and water or skin cleansing wipes prior to skin decontamination ¹¹.
- HCWs are to confirm patient identity and obtain verbal consent from the patient or carer prior to PIVC insertion and the patient or carer is to be provided with information on the risks associated with PIVC prior to insertion. This should be documented in the patient’s medical records. A patient education tool such as the [IV-WISE patient discussion tool](#) can be used to involve patients in PIVC care and assist in prevention of PIVC-related complications ⁶.

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 HCW injury involving a sharp ⁶. The exceptions to this are PIVC required for specialised procedures for which no SEMD is available or where their use interferes with provision of care.
- The size of the PIVC is to be determined by the intended use (e.g. hydration or 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 to [Appendix B](#)) ¹³.

- All PIVC are to have an extension set attached e.g. a J-loop. This is not required in emergency, outpatient or procedural settings where short duration PIVC are used, and the use of a needle free connector is acceptable. If a decision is made to maintain the PIVC for a longer duration an extension set should be added using aseptic technique. Extension sets help maintain PIVC stability and reduce trauma to the vein when accessing the cannula.

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 proximal to the previous site, where possible. The most appropriate vein for insertion of the PIVC is to be selected with consideration of:
 - indication and expected duration of the PIVC
 - size and condition of patient's veins
 - position of the 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.
- Note: It is no longer a contraindication to have a PIVC inserted in the arm of the affected side of patients who have had removal of axillary nodes, axillary surgery, lymph node biopsy, targeted axillary dissection, or axillary clearance ¹⁴.
- Avoid the use of veins in the following sites:
 - areas of flexion e.g. antecubital fossa (ACF), or bony prominences due to increased risk of bloodstream infections (BSIs), PIVC failure and discomfort for the patient
 - the anterior (ventral) forearm veins, especially the cephalic vein, in patients with chronic renal failure, as these may be required for fistula formation for haemodialysis
 - a limb with an arteriovenous fistulae or shunt, as this may compromise access for haemodialysis
 - areas distal previous cannulation sites and bruised or phlebotic areas due to risk of poor venous return and possibility of clots being dislodged
 - an arm on the same side affected by a cerebrovascular accident
 - an infected limb e.g. with cellulitis, due to increased risk of infection
 - a limb with a peripherally inserted central catheter (PICC) or implanted venous access device
 - lower limbs, due to risk of deep vein thrombosis, reduced 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 BSIs ^{15, 16}.

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 ⁶.
- Hand hygiene consistent with the '5 Moments for Hand Hygiene' with an alcohol-based hand rub or antimicrobial hand wash solution and water, is to be performed immediately prior to insertion of the PIVC ⁶.
- Aseptic technique must be used during insertion and ongoing management of the PIVC ^{6, 17}.
- Cannulation equipment is to be prepared in an aseptic manner and key parts capped until use. The use of a sterile PIVC starter pack, sterile dressing pack or aseptic field are to be used to insert all PIVC. The chosen technique must ensure sterile equipment remains sterile and key parts in contact with the bloodstream remain sterile.
- Gloves are to be utilised for insertion of a PIVC. Sterile gloves are recommended to maintain asepsis during PIVC insertion if:
 - the HCW inserting the PIVC is a novice practitioner ^{6, 17}.
 - there is risk of contamination of the area of skin that has already been disinfected by re-palpation.
 - when connecting the hub of the cannula to the extension set there is a risk of contaminating key parts ^{6, 17}.
 - the procedure is anticipated to be technically challenging or involving use of complex insertion techniques e.g. Seldinger Technique ¹⁸.

4.2.6 Skin preparation

The skin must be adequately prepared prior to the insertion of a PIVC.

- Wash the skin with neutral soap and water or skin cleansing wipes if the insertion site is visibly soiled.
- Use clippers to remove hair at the insertion site if necessary.
- Perform skin disinfection using 2% chlorhexidine gluconate in 70% isopropyl alcohol solution, except in the case of documented allergy or in neonates ⁶. Liberally swab a large area of skin around the chosen insertion site to ensure the dressing is applied to disinfected skin.
- Allow skin antiseptic to air dry to ensure adequate contact time. Do not wipe or blot skin to increase drying time.
- For patients with a history of chlorhexidine sensitivity or allergy, use of povidone iodine 10% in 70% ethyl alcohol, or an aqueous 10% povidone-iodine solution if alcohol is contraindicated.

4.2.7 Securement and dressing management

- To allow continuous observation of the PIVC site, and to protect the insertion site from contamination, a sterile, transparent semi-permeable dressing is to be used to secure the PIVC, extension set, or needle free connector if a short stay device.
- The PIVC dressing is to be secured and firmly adhered to the skin, taking care not to contaminate the adhesive part of the dressing where the cannula hub and the extension set connect.
- Opaque tape must not be placed directly over the insertion site, as the insertion site must remain visible for inspection.
- The date and time of PIVC insertion is to be recorded on the adhesive strip of the PIVC dressing, see picture for example.
- The PIVC dressing must be replaced using aseptic technique, if it becomes wet, soiled or loose.
- 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 ¹⁵.



4.2.8 PIVC assessment

- The PIVC and insertion site are to be inspected once per shift, or when clinically indicated, for signs of complications that can lead to device failure. If any complications are identified, the PIVC is to be removed, and the issue documented in the patient's medical record.
- The need for the PIVC is to be assessed against the DRIP criteria each shift and removed as soon as it is no longer required ⁶. If the PIVC is to be maintained, the reason is to be documented in the medical record.
- All PIVC are to be assessed for patency and for any signs of complication each time the device is accessed to determine if the patient is tolerating their PIVC and their understanding of the need for the device ⁶.
- In particular, the following should be inspected:
 - any signs of pain, swelling or redness at the insertion site, by visual inspection through the transparent dressing, and gentle palpation through the dressing
 - condition of the patient's veins, and whether they have become hardened or thrombosed
 - leakage of fluid from the insertion site, and signs of occlusion, infiltration or extravasation
 - the PIVC remains appropriately dressed and secured ⁶.

- All PIVC are to have a peripheral intravenous assessment score (PIVAS) performed each shift while the PIVC is in situ and continued for 48 hours post removal or longer if clinically indicated. Any PIVC site issues are to be documented in the patient's medical record and included in the patient discharge summary to enable post discharge follow up as required e.g. general practitioner, hospital in the home (refer to [Appendix A](#), [Appendix C](#) and [Appendix D](#)).

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 a PIVC due to the potential risk of haemolysis. Exceptions are in an emergency when the patient has limited vascular access, or when a patient is at increased risk of bleeding or receiving thrombolytic therapy ^{13, 15, 19}.
- Except in neonates, infants and children (refer to section 4.3.9), collection of blood cultures is not encouraged at the time of PIVC insertion due to the increased risk of contamination. If blood cultures are collected at the time of PIVC insertion, a second set of blood cultures collected by venepuncture are to be collected ^{19, 20}.

4.2.10 Needle free connectors

- As closed IV access systems are associated with fewer BSIs than open systems, needle free access ports are to be used on all lumens ⁹.
- Stopcocks are to be end-capped with a needle free connector access port when not in use.
- All PIVC access ports are to be disinfected by rubbing the needle free access port for a minimum of 15 seconds i.e. 'scrub the hub' with a single-use 70% alcohol-impregnated swab and allowed to air dry prior to accessing the device ^{15, 21}.
- 70% alcohol has significant and immediate antimicrobial activity and reduces unnecessary exposure to chlorhexidine as the residual activity of chlorhexidine has no benefit on inanimate surfaces ^{9, 16, 22, 23}.
- 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 needle free connectors are to be changed when a PIVC is re-sited.
- Administration sets are to be changed immediately 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 tubing and connections, immediately after completion of the infusion or every 12 hours, whichever comes first ²⁴:

- lipid or lipid-containing parenteral nutrition administration sets must be changed within 24 hours ²¹
- chemotherapeutic agent administration sets must be removed immediately after use ²¹
- propofol administration sets must be changed within 12 hours or as per manufacturer ²¹.
- Administration sets are single use devices, and if they are disconnected from the PIVC for any reason (e.g. intermittent medication dosing), the set is to be discarded and a new administration set connected using aseptic technique ²⁵.
- Administration sets are not to be disconnected for routine care (e.g. showering), but may be disconnected for transient, controlled disconnections such as changing IV access or infusions in operating theatres or medical imaging departments.
- Label all administration sets attached to the PIVC with an IV line label in accordance with the [National Standard for User-applied Labelling of Injectable Medicines, Fluids and Lines](#) ²⁶.

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 5-10mL 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.
- 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 medication or infusion to remove irritant material from the vein and to prevent medication interactions and incompatibilities
 - prior to and after PIVC blood drawing (refer to section 4.2.9)
 - once per shift or at least every eight hours, if the PIVC is not in use (strongly consider 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 Post-insertion of PIVC duration and re-siting

- All PIVC inserted by paramedics, Royal Flying Doctor Service (RFDS) or other emergency services, are to be removed as soon as the patient's condition has stabilised and within 24 hours of insertion, and only replaced if clinically indicated ⁶.
- PIVC that may have been inserted without adherence to aseptic technique are to be removed as soon as practical and within 24 hours of insertion e.g. PIVC inserted during resuscitation or other emergency situations.
- Any patient with a PIVC in situ 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 these findings. If adequate information is not available, the PIVC should be removed and re-sited if there is ongoing clinical indication.
- PIVC inserted into the ACF, or other suboptimal anatomical site (refer 4.2.3) and the DRIP criteria is met, should be re-sited within 24 to 48 hours, or sooner if clinically appropriate ^{21, 27}.
- All PIVC shall be reviewed daily by the patient's medical team, or when clinically indicated, for ongoing need, against the DRIP criteria, and removed as soon as no longer required, and are not to remain in situ longer than 72 hours ^{9, 13, 17, 23}.
- PIVC are to be removed, and the patient switched to alternative delivery e.g. oral, nasogastric, intranasal, intramuscular medication as soon as is appropriate.
- Exception to 72-hour re-siting of PIVC is for patients with known DIVA, and where 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 a senior clinician and clearly documented in the patient's medical record (refer to [Appendix D](#)).
- The PIVC is to be removed if the patient has a PIVAS score of 1 or more, or has a fever >38°C, not explained by other causes.
- If the patient has DIVA or prolonged IV therapy is likely to be required, consideration for a peripherally or centrally inserted central catheter, or a long peripheral venous catheter ('midline' catheter), should be utilised rather than multiple replacements of PIVC.
- If extravasation occurs, special precautions are required prior to removal of the PIVC. Refer to local HCF guidelines.

4.2.14 Removing the PIVC if infection suspected

- The treating medical officer must be informed if infection is suspected. Two sets of blood cultures are to be collected using aseptic technique. Blood culture samples are to be drawn from another peripheral vein and must not be drawn from the existing PIVC.
- Any PIVC site discharge should be swabbed and sent for culture.

- On removal of the PIVC, the catheter tip is to be sent for culture in a sterile screw top container. Note: blood cultures must accompany the tip.
- All actions are to be documented in the patient's medical record.
- Significant events e.g. thrombosis, occlusion, infiltration or extravasation, and PIVC-related site infection or BSI, must be reported in accordance with the HCF incident reporting processes and [MP 0122/19 Clinical Incident Management Policy](#) ²⁸.
- The infection prevention and control (IPC) unit should provide timely feedback to medical and nursing staff when a PIVC-related significant event occurs e.g. *Staphylococcus aureus* BSI.
- Routine culturing of PIVC tips is not recommended unless infection is suspected.

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 C](#) and [Appendix D](#) that meet the requirements of this Guideline and HCFs are encouraged to have standardised documentation.
- For each PIVC inserted, the documentation is to include the date and time of insertion, anatomical site of insertion, the clinical indication for insertion (using DRIP), 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 is 1 or greater, extravasation, vessel hardness or emergency insertion.
- Documentation is to address if a PIVC has been inserted in an emergency situation or without adequate aseptic technique, or when there have been failed insertion attempts.
- The use of an IV insertion label, noting the date and time of insertion, should be attached to the PIVC dressing to act as an additional visual prompt on the PIVC dressing. The label is to be placed on the external transparent dressing, so that it is visible but will not interfere with assessing the PIVC site.
- The label in the PIVC pack can be used as documentation in the patient medical record.
- A PIVAS is to be recorded on every shift for each PIVC site, for the duration the PIVC is in situ, and for 48 hours following PIVC removal to detect post-removal complications (refer to [Appendix C](#) and [Appendix D](#)). Ongoing PIVC site issues beyond 48 hours are to be documented in the patient's medical record.
- All clinical interventions for each PIVC site are to be recorded in the patient's medical record.

4.2.16 Patient education

- Patients or carers are to be provided with information in relation to their PIVC and possible complications (refer [IPPSU tools and resources webpage](#)). HCWs are to have a discussion with the patient or the patient's carer, when appropriate, to ensure they understand the information provided to them.
- If a patient is to be discharged home with a PIVC in situ it must be deemed appropriate by the treating medical team. The patient must be medically stable, have a PIVAS score of zero and be provided with written instructions on how to manage their PIVC at home. There must be a mechanism in place to review the PIVC daily for ongoing need. The PIVC should not remain in longer than 72 hours. Patients requiring longer period of access at home should be reviewed for alternative IV access.
- Patients with a documented history of intravenous drug use, confusion, cognitive impairment, or history of non-attendance or discharge against medical advice should not be discharged home with a PIVC in situ.

4.2.17 Auditing and surveillance

- Surveillance activities should be implemented to address components of the National Safety and Quality Health Service ([NSQHS](#)) [Standard 3](#) (Preventing and controlling infections) and the Australian Commission on Safety and Quality in Health Care (ACSQHC) [Management of Peripheral Intravenous Catheters Clinical Care Standard](#).
- Local surveillance processes, auditing and quality improvement activities should target all HCWs.

4.3 Neonatal and paediatric considerations

4.3.1 PIVC site preferences

It is preferable to use 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.

4.3.2 Insertion

Neonates	Infants, children and adolescents
<ul style="list-style-type: none">• 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 used.	<ul style="list-style-type: none">• A single-patient use tourniquet of the appropriate size is recommended.• SEMDs, where available, are recommended to reduce the risk of sharps injury.

4.3.3 Skin disinfection

Neonates	Infants, children and adolescents
<ul style="list-style-type: none">• If 28 weeks gestation or less, povidone-iodine 10% solution is to be used and allowed to air dry. The antiseptic solution is to be removed 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 ^{29, 30}.• If greater than 28 weeks gestation 1% chlorhexidine solution is to be used and allowed to air dry before proceeding with the procedure. Excess solution should be washed off after the procedure with sterile water or saline to prevent chemical burns ^{29, 30}.	<ul style="list-style-type: none">• For term infants, children and adolescents, 2% chlorhexidine gluconate in 70% isopropyl alcohol can be used.• 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.

4.3.4 Pain management

Neonates	Infants, children and adolescents
<ul style="list-style-type: none"> Non-pharmacological interventions have been shown to be effective for pain management. Recommended practices may include breastfeeding, skin-to-skin contact, breast milk, kangaroo care, holding, swaddling, oral sucrose and non-nutritive sucking ^{31, 32}. Repeated use of sucrose should be used with caution in pre-term infants less than 31 weeks gestation ³³. EMLA cream is not recommended for use in neonates ³⁴. 	<ul style="list-style-type: none"> Distraction, play therapy, topical anaesthetic, 'Buzzy' device, relaxation, breathing and imagery techniques should be used 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.

4.3.5 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, the dressing is to be secure, the site visible, and the taping 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.
- Splints are to be positioned and strapped with the limb and digits in a neutral position and the taping not occlusive or restricting circulation.
- If securing the splint with tape, lightly backing any tape with cotton wool or gauze that has contact with skin should be considered.
- A small piece of cotton wool ball or gauze may be placed underneath the hub of the cannula to reduce risk of pressure injury.
- Splints are to be each shift and changed if wet or soiled.

4.3.6 Flushing

- Use of pre-prepared 0.9% sodium chloride flush syringes (e.g. Posiflush ®) is preferred to drawing up sodium chloride with a syringe and needle.
- For neonates, infants and children, the minimum volume of flush is to be used to clear a line and any add-on devices, of fluid, medication or blood (between and after each medication or fluid administration), as follows:
 - neonates: 0.5mL

- infant: 2mL
- child/adolescent: 5-10mL ³⁵.
- The IV device should be flushed using pulsatile positive pressure technique.
- PIVC without a continuous infusion are to be flushed every 6 to 8 hours to ensure patency.

Neonates	Infants, children and adolescents
<ul style="list-style-type: none"> • A 2.0mL luer lock syringe is to be used. The minimum volume of flush is 0.5mL. 	<ul style="list-style-type: none"> • The PIVC is to be flushed 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).

4.3.7 PIVC assessment

- The PIVC insertion site is to be inspected 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.

4.3.8 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 less than 1mL) or venepuncture (for volumes more than 1mL). An arterial line should be used for critically ill neonates requiring frequent blood sampling ³⁶ .	If multiple blood samples are required for short term investigative procedures or emergency management a peripheral blood sampling line can be inserted ³⁷ .

4.3.9 Duration of PIVC

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

4.3.10 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, if contamination or accidental disconnection occurs, or a blood reaction is suspected ^{9, 37}.

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 \(May 2021\)](#)
- Australian Commission on Safety and Quality on Health Care (ACSQHC): [Patient information – How to look after your cannula](#)
- National Safety and Quality Health Service ([NSQHS\) Standard 3](#) (Preventing and controlling infections)

- National Health and Medical Research Council: [Australian Guidelines for the Prevention and Control of Infection in Healthcare \(May 2019\)](#)
- [IPPSU tools and resources](#) webpage
- WA Country Health Service: [Caring for an intravenous cannula \(drip\), adult](#) consumer factsheet
- WA Country Health Service: [Caring for an intravenous cannula \(drip\), paediatric](#) consumer factsheet

7. Guideline Contact

Enquiries relating to this Guideline may be directed to: Infection Prevention Policy and Surveillance Unit (IPPSU)

Directorate: Communicable Disease Control Directorate

Email: IPPSU@health.wa.gov.au

8. Document Control

Version	Published date	Review date	Amendment(s)
0009 V.1	03/10/2022	03/10/2025	Original version
0009 V.2	14/03/2023	14/03/2026	Amendment to recommendation on sterile glove use
0009 V.3	21 August 2025	31/01/2028	Amendments as listed below

Section 1 Definitions: revised and updated.

Section 4.1 Roles and Responsibilities: cleaning and disinfection of ultrasound probes included.

Section 4.2.1 Insertion and management of PIVC: PIVC assessment revised, DRIP criteria, DIVA escalation and patient education discussion tool included.

Section 4.2.2 PIVC device selection: extension set use clarified.

Section 4.2.3 PIVC site selection: revised.

Section 4.2.5 Standard precautions and aseptic technique: aseptic technique and cannulation equipment revised.

Section 4.2.7 Securement and dressing management: content revised and PIVC dressing picture inserted.

Section 4.2.8 PIVC assessment: DRIP criteria included.

Section 4.2.10 Needle free connectors: Disinfection advice included.

Section 4.2.11 Management of administration sets: revised.

Section 4.2.12 PIVC flushing: timeframe and disconnection advice included.

Section 4.2.13 Post-insertion PIVC duration and re-siting: revised.

Section 4.2.14 Removing the PIVC if infection suspected: revised.

Section 4.2.15 Documentation requirements for PIVC: revised.

Section 4.2.16 Patient education: updated to include discharge information.

Section 4.2.17 Auditing and surveillance section added.

Section 4.3.4 Pain management: EMLA cream not recommended included.

Section 10 References: updated with new references.

Section 11 Appendices: Revised PIVAS assessment criteria to remove cannula at score of one, revised PIVC insertion and observation record and new PIVC insertion and observation record – DIVA and Paediatric added.

9. Approval

Approved by	Dr Paul Armstrong, Director, Communicable Disease Control Directorate, Department of Health
Approval date	31/07/2025

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11. Appendices

Appendix A: Peripheral Intravenous Assessment Score (PIVAS)

Peripheral Intravenous Assessment Score (PIVAS) Assessment criteria and actions required		
<div>  <p>Assess the need for the PIVC against the <u>DRIP</u> criteria below</p> <p>D Is there a risk of sudden Deterioration?</p> <p>R Is Rehydration needed, are IV fluids required?</p> <p>I Are IV medications required?</p> <p>P Are Procedures requiring IV access planned?</p> <p>If “No” to all the DRIP criteria, discuss alternative management options with the medical team before inserting a cannula.</p> <p>If a PIVC is insitu and if “No” to all DRIP criteria remove the PIVC.</p> </div>		
Assess the PIVC site each time it is accessed and document the PIVAS each shift and as per hospital Guidelines.		
<u>LOOK</u>	<u>LISTEN</u>	<u>FEEL</u>
Observe the PIVC site for erythema, swelling or exudate. Is the dressing clean, dry and intact?	Ask the patient or use visual clues. Is there pain or tenderness on infusion, palpitation or movement?	Palpate the site through the intact dressing. Is there any heat or vessel hardening?
Clinical Signs and Symptoms	PIVAS	Clinical Interventions
NO signs of phlebitis and/ or erythema, swelling, exudate, pain, tenderness and IV site appears healthy .	0	<ul style="list-style-type: none"> • Replace dressing if not clean, dry, or intact. • Remove if no longer required and continue PIVAS for 48 hours.
ANY evidence of ONE of the following signs / symptoms at or near the IV site - pain, tenderness or erythema.	1	<ul style="list-style-type: none"> • Remove cannula and continue PIVAS for 48 hours. • Document actions and discuss with medical officer. • Request re-siting if patient still meets DRIP criteria.
TWO of the following signs of Phlebitis are evident at or near the IV site: <ul style="list-style-type: none"> • Pain • Hardness • Erythema • Purulent discharge • Swelling • Palpable venous cord 	2	<ul style="list-style-type: none"> • Remove cannula. • Document vital signs and discuss with medical officer. • Swab site if discharge present (consider blood cultures). • Re-site if patient still meets DRIP criteria. • Complete CIMS.
Fever $\geq 38^{\circ}\text{C}$ not explained by other causes.	 	Obtain 2 sets (4 bottles) of blood cultures from another peripheral vein. Send PIVC tip to pathology.

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 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

The patient should be asked for their previous history of cannulation (if possible).

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.

Appendix C: PIVC Insertion and Observation Record

PIVC Insertion and Observation Record Hospital / Health Service: _____ Ward / Dept: _____ Doctor: _____		Surname		UMRN / MRN		
		Given Name		DOB	Gender	
		Address		Post Code		
PIVC 1 Insertion Details						
Date of insertion: ____ / ____ / ____		Completed insertion sticker can be added to the adjacent box.				
Time of insertion: _____		Avoid using veins in areas of flexion e.g. ACF or bony prominences.				
PIVC insertion site: _____		Insertion Rationale i.e. "DRIP" criteria: <input type="checkbox"/> Deterioration <input type="checkbox"/> Rehydration <input type="checkbox"/> IV Medication <input type="checkbox"/> Procedure				
PIVC gauge: _____ G		<input type="checkbox"/> Difficult intravenous access (DIVA) i.e. no visible or palpable veins and/or limited (2 or less) sites for rotation. Escalate insertion to an experienced clinician.				
Inserted by: _____						
Department: _____						
Insertion Strategies: <input type="checkbox"/> Local anaesthetic <input type="checkbox"/> Ultrasound		IV consumer resource provided to patient/carer: <input type="checkbox"/> Yes <input type="checkbox"/> No				
♦ If ambulance / emergency service insertion, remove when patient is stable or within 24 hrs. Re-site if rationale meets "DRIP" criteria.						
Monitoring and Assessment						
PIVC No:	Insertion Day	♦ 24 hours	48 hours	72 hours (Remove or re-site*)	Continue to monitor for 48 hours after removal, or until IV site healed	
DATE	/ /	/ /	/ /	/ /	/ /	/ /
TIME	AM PM ND	AM PM ND	AM PM ND	AM PM ND	AM PM ND	AM PM ND
DRIP (letter) rationale					Not applicable	
PIVAS 0						
PIVAS 1						
PIVAS ≥ 2						
Initial						
PIVC Removal						
Removal reason:				Date: / /	Time: ____: ____ hours	
Removed by (print name):				Designation:		
PIVC 2 Insertion Details						
Date of insertion: ____ / ____ / ____		Completed insertion sticker can be added to the adjacent box.				
Time of insertion: _____		Avoid using veins in areas of flexion, e.g. ACF, or bony prominences.				
PIVC insertion site: _____		Insertion Rationale i.e. "DRIP" criteria: <input type="checkbox"/> Deterioration <input type="checkbox"/> Rehydration <input type="checkbox"/> IV Medication <input type="checkbox"/> Procedure				
PIVC gauge: _____ G		<input type="checkbox"/> Difficult intravenous access (DIVA) , i.e. No visible or palpable veins and/or limited (2 or less) sites for rotation. Escalate insertion to an experienced clinician.				
Inserted by: _____						
Department: _____						
Insertion Strategies: <input type="checkbox"/> Local anaesthetic <input type="checkbox"/> Ultrasound		IV consumer resource provided to patient/carer: <input type="checkbox"/> Yes <input type="checkbox"/> No				
♦ If ambulance / emergency service insertion, remove when patient is stable or within 24 hrs. Re-site if rationale meets "DRIP" criteria.						
Monitoring and Assessment						
PIVC No:	Insertion Day	♦ 24 hours	48 hours	72 hours (Remove or re-site*)	Continue to monitor for 48 hours after removal, or until IV site healed	
DATE	/ /	/ /	/ /	/ /	/ /	/ /
TIME	AM PM ND	AM PM ND	AM PM ND	AM PM ND	AM PM ND	AM PM ND
DRIP (letter) rationale					Not applicable	
PIVAS 0						
PIVAS 1						
PIVAS ≥ 2						
Initial						
PIVC Removal						
Removal reason:				Date: / /	Time: ____: ____ hours	
Removed by (print name):				Designation:		

PERIPHERAL INTRAVENOUS CANNULA INSERTION AND OBSERVATION RECORD

PIVC Insertion and Observation Record				Surname				UMRN / MRN										
Hospital / Health Service: _____				Given Name				DOB		Gender								
Ward / Dept: _____				Address						Post Code								
Doctor: _____																		
PIVC 3 Insertion Details																		
Date of insertion: ____ / ____ / ____				Completed insertion sticker can be added to the adjacent box.														
Time of insertion: _____				Avoid using veins in areas of flexion, e.g. ACF, or bony prominences.														
PIVC insertion site: _____				Insertion Rationale i.e. "DRIP" criteria:														
PIVC gauge: _____ G				<input type="checkbox"/> Deterioration <input type="checkbox"/> Rehydration <input type="checkbox"/> IV Medication <input type="checkbox"/> Procedure														
Inserted by: _____				<input type="checkbox"/> Difficult intravenous access (DIVA) , i.e. No visible or palpable veins and/or limited (2 or less) sites for rotation. Escalate insertion to an experienced clinician.														
Department: _____																		
Insertion Strategies: <input type="checkbox"/> Local anaesthetic <input type="checkbox"/> Ultrasound				IV consumer resource provided to patient/carer: <input type="checkbox"/> Yes <input type="checkbox"/> No														
♦ If ambulance / emergency service insertion, remove when patient is stable or within 24 hrs. Re-site if rationale meets "DRIP" criteria.																		
Monitoring and Assessment																		
PIVC No:	Insertion Day			♦ 24 hours			48 hours			72 hours (Remove or re-site*)			Continue to monitor for 48 hours after removal, or until IV site healed					
DATE	/ /			/ /			/ /			/ /			/ /		/ /		/ /	
TIME	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND
DRIP (letter) rationale	Not applicable																	
PIVAS 0																		
PIVAS 1																		
PIVAS ≥ 2																		
Initial																		
PIVC Removal																		
Removal reason: _____										Date: / /				Time: ____: ____ hours				
Removed by (print name): _____										Designation: _____								
Comments:																		
PIVAS (Peripheral Intravenous Assessment Score) assessment criteria and actions required																		
Clinical Signs and Symptoms										PIVAS		Clinical Interventions						
NO signs of phlebitis and/ or erythema, swelling, exudate, pain, tenderness and IV site appears healthy.										0		<ul style="list-style-type: none"> Replace dressing if not clean, dry, or intact. Remove if no longer required and continue PIVAS for 48 hours. 						
ANY evidence of ONE of the following signs / symptoms at or near the IV site - pain, tenderness or erythema.										1		<ul style="list-style-type: none"> Remove cannula and continue PIVAS for 48 hours. Request re-siting if still meets DRIP criteria. 						
TWO of the following signs of Phlebitis are evident at or near the IV site:										2		<ul style="list-style-type: none"> Remove cannula. Document vital signs and discuss with medical officer. Swab site if discharge present (consider blood cultures). Re-site if still meets DRIP criteria. Complete CIMS. 						
Fever ≥ 38° C not explained by other causes.										<input type="checkbox"/> Obtain 2 sets (4 bottles) of blood cultures from another peripheral vein. <input type="checkbox"/> Send PIVC tip to pathology.								

Appendix D: PIVC Insertion and Observation Record – DIVA and Paediatric

PIVC Insertion and Observation Record DIVA and Paediatric			Surname		UMRN / MRN													
Hospital / Health Service: _____ Ward / Dept: _____ Doctor: _____			Given Name		DOB	Gender												
			Address			Post Code												
Insertion Details																		
Date of insertion: ____ / ____ / ____			Completed insertion sticker can be added to the adjacent box.															
Time of insertion: _____			Avoid using veins in areas of flexion e.g. ACF or bony prominences.															
PIVC insertion site: _____			Insertion Rationale i.e. "DRIP" criteria:															
PIVC gauge: _____ G			<input type="checkbox"/> Deterioration <input type="checkbox"/> Rehydration <input type="checkbox"/> IV Medication <input type="checkbox"/> Procedure															
Inserted by: _____			<input type="checkbox"/> Difficult intravenous access (DIVA) i.e. no visible or palpable veins and/or limited (2 or less) sites for rotation. Escalate insertion to an experienced clinician.															
Department: _____																		
Insertion Strategies: <input type="checkbox"/> Local anaesthetic <input type="checkbox"/> Ultrasound			IV consumer resource provided to patient/carer: <input type="checkbox"/> Yes <input type="checkbox"/> No															
◆ If ambulance / emergency service insertion, remove when patient is stable or within 24 hrs. Re-site if rationale meets "DRIP" criteria.																		
Monitoring and Assessment																		
PIVC No: _____	Insertion Day			◆ 24 hours			48 hours			72 hours (Remove or re-site*)			DIVA or Paediatric only*					
DATE	/ /			/ /			/ /			/ /			/ /					
TIME	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND	AM	PM	ND
DRIP (letter) rationale																		
PIVAS 0																		
PIVAS 1																		
PIVAS ≥ 2																		
Initial																		
NB: *Exception to 72-hour removal / re-siting - DIVA or paediatric where extended dwell time is clinically indicated, and the PIVAS and clinical assessment supports retention of PIVC.																		
Extended dwell time decisions must be: - determined by the treating team - discussed with the patient - documented in the healthcare record.	DIVA or Paediatric only			144 hours			168 Hours			Continue to monitor for 48 hours after removal, or until IV site healed								
	DATE			/ /			/ /			/ /			/ /			/ /		
	TIME			AM	PM	ND	AM	PM	ND									
	D.R.I.P (letter) Rationale to remain									Not applicable								
	PIVAS 0																	
	PIVAS 1																	
	PIVAS ≥ 2																	
Initial																		
PIVC Removal																		
Removal reason: _____										Date: ____ / ____ / ____				Time: ____: ____ hours				
Removed by (print name): _____										Designation: _____								
PIVAS (Peripheral Intravenous Assessment Score) assessment criteria and actions required																		
Clinical Signs and Symptoms										PIVAS		Clinical Interventions						
NO signs of phlebitis and/ or erythema, swelling, exudate, pain, tenderness and IV site appears healthy.										0		<ul style="list-style-type: none"> Replace dressing if not clean, dry, or intact. Remove if no longer required and continue PIVAS for 48 hours. 						
ANY evidence of ONE of the following signs / symptoms at or near the IV site - pain, tenderness or erythema.										1		<ul style="list-style-type: none"> Remove cannula and continue PIVAS for 48 hours. Request re-siting if still meets DRIP criteria. 						
TWO of the following signs of Phlebitis are evident at or near the IV site: • Pain • Hardness • Erythema • Purulent discharge • Swelling • Palpable venous cord										2		<ul style="list-style-type: none"> Remove cannula. Document vital signs and discuss with medical officer. Swab site if discharge present (consider blood cultures). Re-site if still meets DRIP criteria. Complete CIMS. 						
Fever ≥ 38° C not explained by other causes.												<input type="checkbox"/> Obtain 2 sets (4 bottles) of blood cultures from another peripheral vein. <input type="checkbox"/> Send PIVC tip to pathology.						

PERIPHERAL INTRAVENOUS CANNULA INSERTION AND OBSERVATION RECORD

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

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