Royal Hospital for Women (RHW)

BUSINESS RULE

COVER SHEET

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SUMMARY	The aim of this CBR is to provide standardised care and management for Central Venous Access Devices (CVAD) and Midline Catheters by appropriately trained registered nurses, registered midwives and medical officers. The clinical requirements for the care and management of CVADs / Midline Catheters must only be performed by accredited and competent clinicians.
Key Words	CVAD, Central Venous Access Device, Peripherally Inserted Central Catheter, PICC, Midline Catheters, Infection Control

CENTRAL VENOUS ACCESS DEVICE (CVAD) & MIDLINE CATHETERS MANAGEMENT FOR ADULTS

RHW CLIN114

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Within this document we will use the term woman, this is not to exclude those who give birth and do not identify as female. It is crucial to use the preferred language and terminology as described and guided by each individual person when providing care.

1 BACKGROUND

The aim of this CBR is to provide standardised care and management for Central Venous Access Devices (CVAD) and Midline catheters by appropriately trained and competent clinicians to maintain patency and prevent device failure or complications in accordance with NSW Health policy directive Intravascular Access Devices (IVAD) - Infection Prevention & Control.

Only accredited and competent clinicians should perform CVAD / Midline catheter procedures. For clinicians gaining a new competency, direct supervision from an experienced clinician, clinical educator or clinical nurse consultant is mandatory.

CVADs are indicated when an extended duration of intravenous treatment is required such as chemotherapy or long-term antibiotics, patients with poor vascular access and for the administration of hyperosmolar solutions (>600 mOsm/L) which are highly irritant to the vessels and to prevent phlebitis should not be infused peripherally e.g. total parenteral nutrition. (1)

Insertion of a CVAD and the device selected is determined by the treating medical team. The device chosen will differ based on induvial patient needs, vessel health, intended use and predicted dwell time.

Infection Prevention:

- Hand hygiene remains the single most important practice to prevent CVAD-related infections. (1)

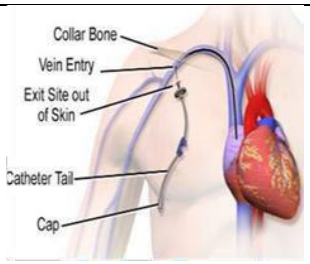
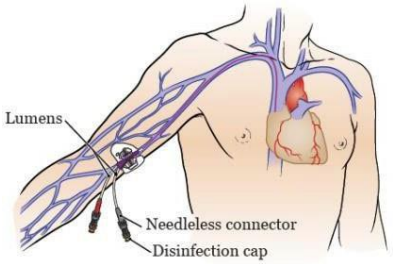
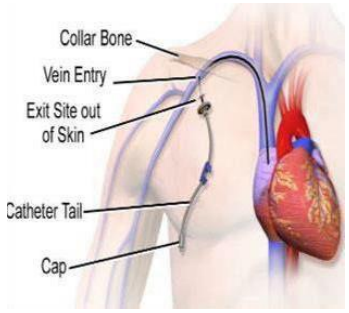
- Hand hygiene must be performed consistent with current policy and according to the five moments of hand hygiene prior to every CVAD procedure or assessment. Infection Prevention and Control in Healthcare Settings

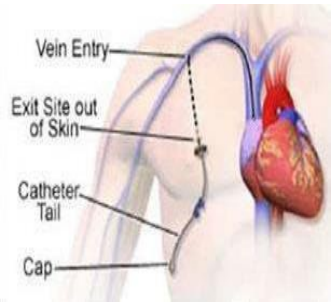
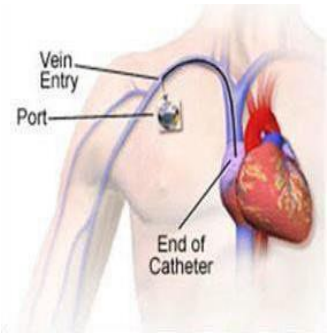
- Aseptic Non-Touch Technique (ANTT) must be adhered to whenever the CVAD is accessed, this includes accessing any lumens for medication administration, change of administration set or blood sampling. Aseptic Technique.

- All clinicians require education and competency assessment prior to being involved with CVAD management to prevent complications.

- To reduce the risk of device contamination and bloodstream infections, manipulations of an intravascular device should be kept to a minimum and a continuous flow (closed) system used wherever possible. Intravascular Access Devices (IVAD) - Infection Prevention & Control (nsw.gov.au)

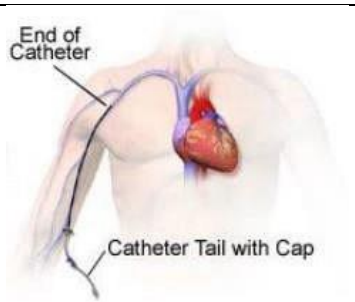
Types of CVADs:

Centrally inserted Central Venous Access Device (CICVAD) which have a skin entry point in the neck or trunk. (Vascath, Hickman, Jugular CVC)	
Peripherally inserted central catheter (PICC): Inserted via either of the following peripheral veins i.e., basilic, brachial or cephalic veins.	
Non-Tunnelled CVAD - the catheter insertion and exit points are the same. (Jugular/Femoral CVC, Non-Tunnelled Vascath, PICC)	

Tunnelled CVAD: the catheter is inserted through one point and then "tunnelled" under the skin to a remote exit point. These catheters are for long term use (Hickman, Tunnelled Vascath and Apheresis Catheter).	
Implanted Venous Port: This device also known as a Port-a-cath is a CVC placed under the skin. The catheter is positioned in the central circulation and tunneled to the port body, which is positioned in a subcutaneous pocket. External access is achieved with a non-coring needle (i.e. Huber point needle) -	

Midline Catheters

Midline catheters are a long line peripheral cannula, suitable for patients requiring intravenous therapy for a maximum of 30 days. Midline catheters are 8-20cm in length and are inserted by anaesthetics using ultrasound guidance. To maintain line patency blood sampling from a midline should be avoided at RHW**. Midline catheters are NOT a CVAD and therefore must ONLY be used for intravenous fluids or medications which are suitable for administration through a peripheral cannula.**
Verbal consent from the patient and a Level 1 clinical procedures safety checklist must be completed prior to insertion of a Midline catheter. Clinical Procedure Safety

Midline Catheter: Inserted into the upper arm via the basilic, cephalic, or brachial vein, with the internal tip located level at or near the level of the axilla and distal to the shoulder	 Midline Catheter

Contraindications:

- End-stage renal failure requiring vein preservation
- Restricted blood flow to the upper extremities
- History of venous thrombosis
- Continuous infusions of irritants or vesicants (solutions that cause blistering)
- Hyperosmolar solutions due to an increased risk of phlebitis
- Solutions with a pH >9
- Total Parenteral Nutrition
- Chemotherapy
- Incompatible solutions / medications must NOT be administered via Midline catheters even if more than one lumen is present
- Frequent blood sampling

2. RESPONSIBILITIES

To ensure patient safety all clinicians involved in CVAD / Midline care and management must adhere to this clinical business rule and are responsible for achieving and maintaining competence in the care and management of CVAD / Midline catheters within their scope of practice.

Medical staff are responsible for selecting the most appropriate device for the patient's condition, arranging insertion of the CVAD device in theatre by anaesthetics or interventional radiology and ordering the removal of the device once no longer required.

Registered Nurses and Midwives who have completed the associated mandatory training and competencies are responsible for providing appropriate education to the patient, complete daily assessments, maintenance, removal and post removal care of the CVAD device.

3. TRAINING REQUIREMENTS

OBTAINING COMPETENCE

Prior to caring for a CVAD, staff must complete the following My Health Learning Module: Central Venous Access Devices: the fundamentals (92708229) and attend a Central Venous Access Devices Workshop (2 hours) (CSK1350).

This program consists of sequenced stages incorporating theory, clinical teaching, supervised clinical practice and assessment of understanding.

Clinical education and practice demonstrations are provided by Clinical Nurse Educators or Clinical Nurse Consultants who are content experts in CVAD management.

A clinician who has undergone the appropriate training, assessment and deemed competent by a clinician with CVAD expertise. Assessment is executed using the competency tools:

1. CVAD Dressing and Swabable Capless Valve (SCV) Change Assessment Tool (92381360)
2. CVAD Intravenous (IV) Administration Set Change Assessment Tool (92382298)
3. CVAD Removal of a Non-Tunnelled Assessment Tool (92382007)

4. PROCEDURE

4.1 Clinical Practice

INSERTION

- CVADs should be inserted in theatre or interventional radiology whereby a sterile environment can be maintained
- Central Venous Access Devices (CVAD) pose a risk of air embolism in patients during insertion and removal.
- Record of insertion is documented on the CVAD/Midline Insertion & Removal online form on eMR.
- Complete immediate post-insertion observations which include monitoring the CVAD site for leakage, haematoma, haemorrhage, or pain.
- If the CVAD was inserted under sedation the patients' vital signs (HR, BP, RR, temp and SpO2) should be monitored every 15 minutes for 1 hour post insertion or as per operation / procedure report. Escalate vital signs which differ from the patient's baseline or activate a CERS call if criteria are met.
- The CVAD must not be used until the correct anatomical tip position is confirmed on a chest x-ray and this is documented on the online CVAD Insertion Record or eMR by a medical officer.
- The patient should be provided with the appropriate education and CVAD patient information sheet.
  PICC Patient handout TIVAD Patient handout

Maintenance and Monitoring

- CVAD Observations are completed each shift and documented on iView in eMR.
- Include measurement of the external length of the catheter and compare this to the value documented on the CVAD insertion record.

Consistent measurements are vital, this should be from the point of insertion at the skin to the base of the catheter Y junction.

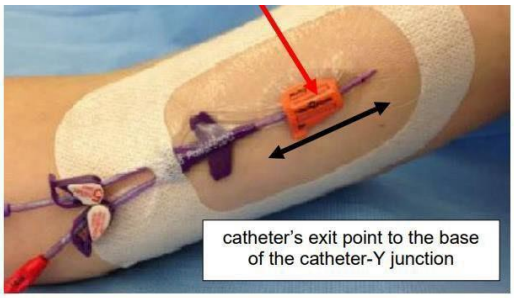


Image demonstrating external measurement

- If abnormalities are noted (e.g. erythema, discharge, swelling, migration of length >2cm) initiate immediate review by an anaesthetist or Medical Officer (MO) and document this on eMR.
- In the event of suspected catheter tip migration greater than 2 cm, a chest x-ray is required to confirm the tip is in the correct position. Never re-advance a migrated CVAD into the vein, stabilise at the current location and escalate to anaesthetics for appropriate intervention.
- Remove CVADs that are no longer required as soon as possible to prevent complications.

ACCESSING CVAD LUMENS

- Access CVADs ONLY when necessary!
- Patients must not be disconnected from the infusion line for a shower as this increases the risk of infection. (2)
- CVADs and Midline catheters are flushed and aspirated for blood return prior to commencing an infusion to assess catheter function and prevent complications.
- Assess patient for any allergies including skin cleaning solutions and dressing types.
- Scrub the hub: Using 2% Chlorhexidine / 70% Alcohol solution (ChloraPrep®) generate friction by scrubbing in a twisting motion for 20 seconds, scrubbing the top of the hub, not just the sides. Allow to air dry for 30 seconds, this action reduces the risk of infective microorganisms entering the patient's vasculature.
- Use 10 mL or 20 mL syringes to flush and lock CVADs as smaller size syringes can generate pressure that may damage or rupture the catheter.
- Clamp and positive pressure lock all unused lumens or any lumen that is disconnected form the IV line.

Accessing CVAD lumens

Equipment

Cleaned Dressing Trolley Alcohol based hand rub Dressing pack Waste bag Personal Protective Equipment (PPE) Sterile gloves Line labels Chlorhexidine Gluconate and 70% Isopropyl Alcohol solution 10ml Luer lock syringes Drawing up needle 10ml Sodium chloride 0.9% ampules (or sterile BD Posi-Flush® prefilled saline syringes)

Procedure: Accessing CVAD lumens (patency check, flushing and locking)

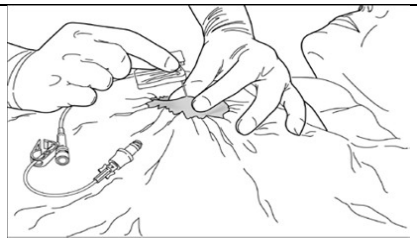
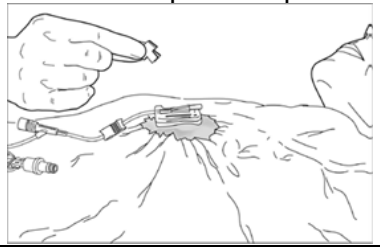
Explain the intended procedure to the patient and obtain verbal consent
Perform hand hygiene
Position patient in a comfortable position which allows for unobstructed CVAD / Midline Catheter access and & complete CVAD/ Midline catheter assessment
Perform hand hygiene & put on non-sterile gloves
Set up equipment as per ANTT principles
Remove non-sterile gloves, perform hand hygiene and put on sterile gloves
Place sterile plastic backed absorbent sheet underneath catheter
Scrub the hub using 2% Chlorhexidine / 70% Alcohol solution (Chlora-prep®) for 30 seconds to decontaminate the bung.
Repeat the ‘scrub the hub’ process a further two times.
Allow to completely air dry.

Attach the 10mL Luer lock syringe to the bung, unclamp the lumen then aspirate 2-5mLs of blood.
If no aspirate is obtained slowly inject 2mLs of sodium chloride and then aspirate until blood return to confirm patency.
Clamp the lumen, disconnect the syringe and discard.
Flush the lumen using a pulsatile push/pause technique with 10mLs of 0.9% sodium chloride. Clamp the lumen before the last 0.5mLs is administered.
If 50u/5mls Herpainised saline is used to lock the line – this must be prescribed on the patient's medication chart.
Check that all connections are secure.
Label each lumen with 'CENTRAL VENOUS', include locking solution and date. Note use 'IntraVENOUS' if Midline catheter.
Dispose of used equipment. Clinical and Related Waste Management for Health Services
Remove gloves and perform hand hygiene.
Document in the patient's electronic medical record and CVAD observations on iView.

PORT-A-CATH - Access an implanted venous port

Equipment	Procedure
Cleaned trolley	Explain the intended procedure to the patient and obtain verbal consent, gather equipment and position patient to allow access to port without risk of contamination.
Sterile dressing pack	Observe the insertion site for any visible abnormalities such as erythema, warmth, swelling, tenderness and discharge. Attend a swab if any exudate present for MC&S and refer to medical officer for review. Assess the size of non-coring needle required.
Waste bag	Perform hand hygiene,
Plastic backed absorbent sheet	Set up equipment as per ANTT principles, ensure to check injectable solutions with an RN or MO.
Sterile gloves	Perform hand hygiene and don sterile gloves.
2% Chlorhexidine and 70% Alcohol cleaning solution (Chlora-prep®) (if patient is allergic to chlorhexidine then a sterile povidone iodine solution could be used)	Draw up injectable solutions in 2 x 10mL syringes using blunt drawing up needle
Transparent semi-permeable polyurethane dressing (e.g. OPSITE IV 3000® or Tegaderm®)	Clean the area with 2% chlorhexidine and 70% alcohol cleaning solution or Chlora-prep® applicator and allow to dry. Cover an area larger than the approximate size of the dressing to be used. ***NOTE:*** *Receptacles containing skin preparation solution should be removed from the sterile setup following application of the solution to the skin to avoid solutions being administered by the wrong route.*

Right angled non-coring needle (e.g. Huber needle)	**Prepare and prime needle and tubing. Note: HUBER NEEDLE –** Attach needless injection ports to both entry ports of the gripper needle extension tubing, prime and clamp.
Tape	Fold the sterile drape in quarters and tear a hole in the centre to create a fenestrated drape. Place the sterile towel over the port with the port visible through the hole
1 x 5mL Heparinised saline (50Units/5mL)	Stabilise the port with your index finger and thumb.
PPE	Insert needle at a 90º angle to the skin and push until the needle touches the base. **Caution: Do not push too firmly into the base as this will damage the needle causing it to bend'**

Sodium Chloride 0.9% (to clean line if blood exudate present)	
Bung (s) for each lumen (Needless injectable ports)	Connect an empty 10mL syringe and aspirate withdrawing 3-5mLs of blood Disconnect the syringe with blood and discard
10mL luer lock syringes (x2 per lumen)	Connect the 10mL syringe with saline and flush and lock the port using a pulsatile motion
1 x 18g needle	Remove the plastic clip for holding 

2 x 10mL Sodium chloride 0.9% ampoules or sterile pre-filled 0.9% sodium chloride syringes per lumen	Fold the fenestrated towel downward to expose the area around the port
Discard waste as per institutional policy Clinical and Related Waste Management for Health Services	Place the dressing over the port, keeping the access point in the centre of the dressing 
	Mould the dressing around the port and onto the skin, to remove as much air pocket as possible
	Remove plastic tabs and place around non-reinforced edges of the dressing to create a window frame.
	If the port is to be used immediately connect a new IV-administration line and fluids.

FLUSHING

Always maintain ANTT throughout the procedure when flushing and locking.
Do not use excessive force when flushing a CVAD or Midline catheter. If resistance is noted **stop** until any potential problem can be identified and corrected. If you encounter resistance notify the CNE, CNC, or Anaesthetic registrar immediately.
CVADs must be flushed with a minimum of 10 mLs 0.9% sodium chloride injected using a pulsatile action before and after administration of medications.
A pulsatile action refers to a method of flushing by injecting Sodium Chloride 0.9% into a CVAD using a repeated push-stop, push-stop technique creating a turbulent flow, and improving catheter clearance.

CVAD lumens that are disconnected from the IV line must be clamped and positive pressure locked to prevent air embolism and back flow of blood.
Unused lumens are assessed weekly for patency, not routinely each shift.

HEPARIN LOCK

Heparin in Sodium chloride 0.9% 50units/5mL (Heparinised Saline) as a locking solution for unused CVAD lumens must be prescribed on the patient's electronic medication record (eMR) and checked by 2 RNs prior to administration. The total volume to be given is 5mls administered via a 10mL Luer lock syringe, as smaller size syringes can generate pressure that may damage or rupture the catheter.

All unused lumens containing Heparinised saline must be labelled using the NSW Health Heparin Locked pre-printed, teal green sticker.

If the CVAD is heparin locked, the heparin must be aspirated from the line and discarded prior to flushing.

Heparin is a high-risk medication which if used in error can result in significant adverse patient outcomes. Complications of heparin administration include sensitivities, bleeding, and heparin-induced thrombocytopenia.(3) Always check for drug incompatibilities before administration.

! **CAUTION** there are multiple higher concentrations of Heparin for injection.

- 25'000u /5mls
- 5'000u/ 0.2mls
- 5'000u /1ml
- 5'000u /5mls

- Always complete the 5 rights of medication administration to ensure the correct drug is selected: **Heparin in Sodium chloride 0.9% 50units/5mL** Medication Handling

The Right **Patient** | The Right **Drug** | The Right **Dose** | The Right **Time** | The Right **Route**.

8.1.4 MAINTENANCE OF ADMINISTRATION SETS

- A new administration set is required for a new CVAD or Midline catheter.
- Lumens are assessed for patency prior to connecting an administration set.
- A double spike IV administration set is usually required to minimise the use of a secondary IV administration or extension set being attached to the primary line, which has the potential to introduce infection.
- The administration set must be primed immediately before being connected to a CVAD.
- A closed system should be maintained as intermittent disconnections of administration sets significantly increases the risk of infection.
- Administration sets should not be disconnected for showering, dressing or mobilising.
- Any disconnected administration set must be discarded, and a new set primed.
- When an administration set is changed, the IV fluid bag must also be changed.
- Frequency of line change is dependent on the type of device and infusion.
- All CVAD lines must be labelled with the date and time of commencement using the below NSW Health CVAD label:

Line change requirements are specified in the NSW health policy directive: Intravascular Access Devices (IVAD) - Infection Prevention & Control (nsw.gov.au) See table below.

Table 7: Frequency of Line Change

Administration Set Use	Frequency of Change
Continuous use (NOT containing lipids, blood or blood products)	Do not need to be replaced more frequently than every 96 hours unless device-specific recommendations from the manufacturer indicate otherwise (51). Change intermittent infusion sets without a primary infusion every 24 hours or whenever their sterility is in question (59).
Blood and blood products	Must be changed when the transfusion is complete, or every 12 hours if the transfusion is not complete (60). The maximum number of blood products as per the manufacturer's recommendations has been reached. Any number of red cell units may be transfused during a 12-hour period, provided the flow rate remains adequate (60). Platelets must be transfused via a new blood administration set. Note: Manufacturer's recommendations defining the maximum number of units per blood administration set must not be exceeded.
Lipid containing solutions and parenteral nutrition	Changed every 24 hours or as recommended by the manufacturer.
Lipid containing medications (e.g. Propofol, Clevidipine)	Changed at minimum every 12 hours or as per the manufacturers' instruction (61).
Chemotherapeutic agents	Remove immediately after use. On completion of infusion including the line flush. The chemotherapy infusion episode may include more than one agent, it is common practice to utilise the same administration set, with line flush in between in order to ensure the full dose has been administered.

DRESSINGS

Antiseptic cleaning solution:

1st line: 2% Chlorhexidine gluconate preparation with 70% Isopropyl alcohol (e.g. Chlora-Prep®).

2nd line: 10% Povidone iodine for patients who are known to have a sensitivity to chlorhexidine.

Dressings

1st line: A sterile, transparent semi-permeable dressing with Chlorhexidine gluconate (e.g. Tegaderm® CHG) for CVCs, PICCs and Midlines which protects the site from contamination whilst allowing for continuous observation. For Ports use Opsite 3000®.
This is changed every 7 days or sooner if the integrity of the dressing is compromised. This includes if the dressing becomes damp, loosened, soiled, or there is evidence of inflammation and/or an accumulation of fluid.

(if the patient has an allergy to chlorhexidine use Opsite 3000® as primary dressing)

2nd line: Sterile gauze dressing may be used with hypoallergenic tape around the border if there are skin reactions or allergies to all transparent semi-permeable dressings. Sterile gauze dressings are changed every 48hours or sooner if the dressing becomes compromised (as above).

If adverse skin reaction is noted to secondary dressings or skin solution refer to the following Skin Management Algorithm:(4)
Publications & Resources - CNSA - Cancer Nurses Society of Australia

- Adhesive Securement Device (ASD) i.e. StatLock® are replaced with each dressing change.
- Subcutaneous Anchored Securement System i.e. SecureAcath® are not replaced. The SecureACath® will remain in situ for the duration of the CVAD.

Dressings for centrally inserted central venous access devices (CVCs) should be attended when patient is supine to allow access to site and to prevent complications in the event of accidental dislodgement/migration of device.

Dressing Change

Equipment

Cleaned Dressing Trolley Alcohol based hand rub Dressing pack Waste bag Personal Protective Equipment (PPE) Non sterile gloves Sterile gloves 2% Chlorhexidine Gluconate and 70% Alcohol applicator (Chlora-prep®) *[or sterile povidone iodine solution if chlorhexidine allergy]* Sterile, transparent CHG dressing Securement device (Statlock®) Bungs for each lumen 10ml Luer lock syringes – 2 per lumen 10ml 0.9% sodium chloride ampules – 2 per lumen (or sterile BD PosiFlush® prefilled saline syringes)

Dressing Procedure

Explain the intended procedure to the patient and obtain verbal consent.
Perform hand hygiene
Position patient for unobstructed CVAD catheter access which avoids contamination of key parts
Complete CVAD/ Midline catheter assessment
Perform hand hygiene and set up equipment as per ANTT principles
Perform hand hygiene and don PPE including non-sterile gloves
Remove old dressing and adhesive securement device, taking care to pull towards insertion site.
Note – avoid touching the insertion site with non-sterile gloves
Remove non-sterile gloves & perform hand hygiene
Don sterile gloves
Clean the insertion site with 2% Chlorhexidine Gluconate and 70% v/v Isopropyl Alcohol (Chlora-prep applicator) using gentle friction and a ‘back and forth’ motion for at least 30 seconds.
Clean the external length of the catheter with 2% Chlorhexidine Gluconate and 70% v/v Isopropyl Alcohol-soaked sterile gauze.

Dressing Procedure Continued..

Place sterile, plastic backed towel under the lumens
Allow the area to dry naturally until completely evaporated
Place new adhesive securement device if required.
Apply new transparent CHG dressing, ensuring insertion site is in the central of the dressing

Change of Bungs

- Prime bungs with 0.9% sodium chloride
- Verify catheter clamps are closed
- Change bungs using ANTT
- Scrub the hub using 2% Chlorhexidine Gluconate and 70% Alcohol solution and allow to dry
- Attach 10ml Sodium chloride 0.9% syringe
- Unclamp the lumen and flush using pulsatile action and positive pressure lock
- Unclamp the lumen and flush using pulsatile action and positive pressure lock
- Discard waste Clinical and Related Waste Management for Health Services
- Remove gloves, perform hand hygiene and document procedure on eMR

Subcutaneous Anchored Securement System (SecurAcath®) Dressing Change

Image: SecurAcath clinician resource materials (5)

- Remove old dressing as per above procedure whilst stabilising the SecurAcath.
- Using sterile gauze, gently lift or hinge the catheter and SecurAcath device between 45-90 degrees from insertion site to clean around the catheter.
- Clean skin 360˚ degrees around the insertion site using 2% Chlorhexidine Gluconate and 70% Isopropyl Alcohol Chlora-prep applicator.
- Clean the external length of the catheter with 2% Chlorhexidine Gluconate and 70% Isopropyl Alcohol Chlora-prep solution.
- Allow to air dry whilst the SecurAcath remains lifted. Be careful not to allow the catheter to twist or migrate.
- Apply new dressing ensuring SecurAcath is stabilised under the dressing.
- Discard waste, remove gloves, perform hand hygiene
- Document procedure on eMR.

Subcutaneous Anchored Securement System (SecurAcath®) Removal

For SecureACath removal please see: 1329-013-RevK-02_21_2022.pdf (securacath.com)

TROUBLE SHOOTING

Troubleshooting a blocked CVAD using negative pressure technique is an advanced skill and an extended role for senior experienced staff only.

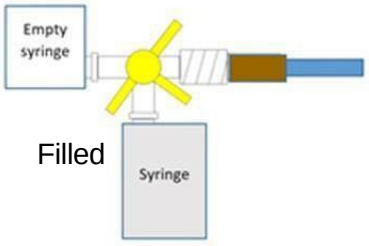
Equipment

Cleaned Dressing Trolley Alcohol based hand rub Sharps container Dressing pack Waste bag Personal Protective Equipment (PPE) Non-sterile gloves Sterile gloves 2% Chlorhexidine Gluconate and 70% Alcohol solution Three-way tap 2 x 10mL Luer lock syringes 1 x 18g drawing up needle 10 mLs 0.9% sodium chloride (or sterile BD PosiFlush® pre-filled saline syringe)

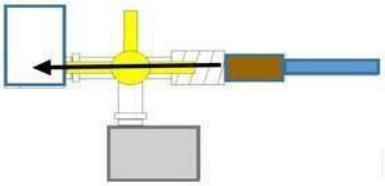
Procedure: Trouble shooting a blocked CVAD using negative pressure technique

Explain the intended procedure to the patient and obtain verbal consent.
Gather equipment and perform hand hygiene
Position patient to allow unobstructed access to CVAD without risk of contamination of key parts
Perform hand hygiene and set up equipment as per ANTT principles
Perform hand hygiene and don PPE and sterile gloves
Draw up injectable solution into one syringe
Connect and prime the three-way tap
Attach second empty syringe
Decontaminate the bung with a 2% Chlorhexidine / 70% Alcohol swab using ‘’scrub the hub” technique

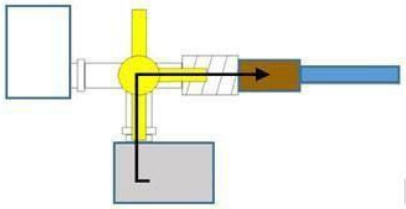
Attach the three-way tap with syringes to the bung of the lumen. Turn the tap off to all lumens.



Create partial vacuum by turning tap off to the filled syringe.



Turn the tap off to the empty syringe, making note of how much of the solution is drawn into the lumen. NOTE: this occurs by negative pressure.



- If blood is aspirated then discard blood, pulsatile flush with 10mL Sodium Chloride 0.9% and positive pressure lock the lumen.
- If blood cannot be aspirated, repeat the last three steps and leave some solution in the lumen, turn 3-way tap off to all points and label lumen. Leave for up to two hours to allow the solution to work.
  After the set time has passed, recheck by using the same negative pressure technique.
- If blood can be aspirated, then pulsatile flush with 10mL 0.9% Sodium Chloride and positive pressure lock lumen. If unable to aspirate blood, refer to treating team for further considerations.

REMOVAL

The necessity for a CVAD should be assessed daily for inpatients and removed as soon as no longer required.
A CVAD is only removed by clinicians competent in the procedure on the order of a senior medical officer as documented in the electronic medical record (eMR) in consultation with the treating team. Routine CVAD replacement is not recommended, and the catheter should only be changed when clinically indicated.

Different removal techniques and positioning are required for different types of CVADs to reduce the risk of air embolism.

- Central Venous Catheters (CVC)

  Lie patient supine with head slightly down and removal should be timed to occur at end inspiration or whilst performing the Valsalva manoeuvre or during expiration. The patient must remain in this position for 30 minutes post removal. The patient must not be transferred during this time.

- Peripherally Inserted Central Cathers (PICC)

  Patient can lie or sit for removal procedure providing arm is able to be abducted below the level of the heart. Patient may breathe normally during the removal procedure

- Tunnelled CVAD / Totally Implantable Venous Access Devices, Port-a-Cath
  Requires removal in theatre or interventional radiology.

For patient comfort, improved accessibility, and to prevent contaminating key parts all CVADs are removed in a bed or trolley.
The catheter line length must be measured post removal to ensure it corresponds with the recorded length on the insertion record.
A sterile, occlusive dressings must stay in place until the CVAD insertion site has healed (a minimum of 48 hours).
Old insertion sites should be monitored and documented daily for signs of bleeding, haematoma, and infection.

Key Safety Points

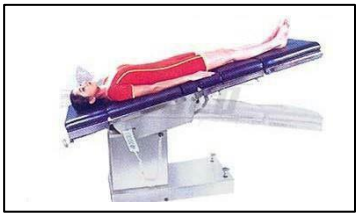
- Check coagulation studies, anticoagulation dosing, history, and timing prior to removal.
- Never use force when removing CVADs.
  If resistance occurs STOP the procedure, apply occlusive dressing, keep the patient positioned supine and escalate immediately to MO.
- A full set of vital signs is completed immediately post removal whilst the patient remains supine.
- Observe for signs of respiratory distress or deterioration.
- Vital signs are attended immediately prior to retrieving the patient to the upright position
- Patients must not be moved location 30 minutes post CVAD removal.
- A full set of vital signs must be attended and documented prior to transfer.
- Do not transfer to another clinical area if the patient displays any signs of clinical deterioration or abnormal observations post CVAD removal.

Air Embolism

The risk of an air embolism is increased during CVAD insertion and removal.(6)

Signs and Symptoms of Air Embolism:

- Chest pain
- Tachypnoea / Dyspnoea/ Wheeze /Coughing
- Hypotension
- Tachycardia
- Decreased level of consciousness
- Desaturations



An air embolism is a Code BLUE.

Activate a CERS call Code BLUE immediately.

Administer 100% oxygen and place the patient on their left side and in the Trendelenburg position.

CVAD Removal

Clinical staff unfamiliar with the removal process and/or performing the removal procedure for the first time should only do so under direct supervision and guidance of senior staff experienced and confident in performing the intended procedure.

Equipment

Cleaned Dressing Trolley Alcohol based hand rub Sharps container Dressing pack Waste bag Personal Protective Equipment (PPE) Non-sterile gloves Sterile gloves Stich cutter 2% Chlorhexidine Gluconate and 70% Alcohol applicator (Chlora-prep®) Airtight occlusive dressing 2 x 10ml Luer lock syringes 1 x 18g needle 10mls 0.9% sodium chloride

Procedure

Confirm medical order documented to remove CVC/PICC
Explain procedure to the patient and obtain verbal consent
Complete Clinical Procedure Safety Checklist Level 1
Educate patient and practice Valsalva maneuver or holding breath technique (if CVC)
Perform hand hygiene
Set up equipment as per ANTT principles
Perform hand hygiene
Complete CVAD assessment, ensuring all lumens are clamped

CVC: Patient placed in supine or Trendelenburg position (if CVC) PICC: Patient placed in a sitting or recumbent position with the catheter exit site at or below the level of the heart
Perform hand hygiene, don non-sterile gloves.
Place plastic backed sheet underneath the CVAD lumens.
Gently remove the old dressing and fixation device, taking care to pull towards the insertion site.
NOTE: – avoid touching the insertion site with non-sterile gloves
Observe site for inflammation, swelling, pain and discharge. Swab the insertion site for MC&S if required and notify MO post procedure.
Remove gloves, perform hand hygiene and don Sterile gloves.
Clean the insertion site with 2% Chlorhexidine Gluconate & 70% Isopropyl alcohol Chlora-prep® applicator using gentle friction for 30 seconds.
Allow to air dry naturally
Cut and remove suture
Instruct the patient to take a deep breath and HOLD until told to release or complete the Valsalva maneuver. If neither is possible the CVC must be removed on end inspiration.
Remove the CVC without force and simultaneously apply gentle pressure with sterile gauze over the insertion site until haemostasis is achieved.
The patient can now resume a normal breathing pattern.
Apply a sterile, airtight, occlusive dressing which remains in situ for at least 48 hours.
Confirm that the length of the removed CVAD matches the length recorded on the CVAD insertion record and that catheter tip is intact. The tip must be observed by a 2nd RN.
If catheter tip culture is required use sterile scissors to cut the distal end of catheter and place into a sterile specimen container. **NOTE:** Ensure catheter tip does not touch the patient's skin

Discard waste, remove gloves and perform hand hygiene. Clinical and Related Waste Management for Health Services
Complete a full set of observations
The patient must lay flat for a minimum of 30 mins (if CVC).
Document the procedure on the CVAD removal form on eMR and on iView.
Perform hand hygiene
Take another full set of observations prior to sitting the patient up.

De-accessing the implantable venous port	
Equipment	**Procedure**
Cleaned trolley	Explain procedure to the patient
Sterile dressing pack	Perform hand hygiene
Waste bag	Set up equipment as per ANTT
Plastic backed absorbent sheet	Position patient
Non-sterile gloves	Place plastic backed absorbent sheet
2% Chlorhexidine and 70% Alcohol cleaning solution (Chlora-prep®)	Don non-sterile gloves
5mLs Heparinised Saline (50 units/5mL)	Flush and heparin lock device
Tape	Gently remove the old dressing
Sharps bin	Stabilise port reservoir between thumb and forefinger
2 x 10mL syringe	Pull lever to remove needle out vertically away from the skin until it clicks into place
10mL Sodium chloride 0.9%	Retract the needle hub away from the skin and place directly in sharps bin
Occlusive dressing	Cover site with occlusive dressing and instruct the patient this can be removed after 2 hours.
Document the procedure.	Discard waste, remove gloves and perform hand hygiene. Clinical and Related Waste Management for Health Services

4.2. Documentation

- Electronic Medical records: eMR
- CVAD/Midline Insertion and Removal record online form
- CVAD assessment and shift observation recorded on iView
- Patient information:
  PICCs: PICC Patient handout
  Portacath: TIVAD Patient handout

4.3 Competency Assessments

On successful completion of the following assessment tools, you will be deemed competent to perform, unsupervised, the procedure in your clinical practice.
These assessment tools are designed to be used by a site approved Assessor to assess the clinical competency of nursing and midwifery staff in the performance of each procedure.

CVAD Dressing and Swabable Capless Valve (SCV) Change Assessment Tool (92381360)
CVAD Intravenous (IV) Administration Set Change Assessment Tool (92382298)
CVAD Removal of Non-Tunnelled Assessment Tool (92382007)

4.4 Related Policies/Procedures

- South Eastern Sydney Local Health District Policy (2021) SESLHDPD271 Aseptic Technique.
- NSW Health Policy Directive (2019) PD2019_40 Intravascular Access Devices (IVAD) - Infection Prevention & Control
- NSW Health Policy Directive (2023) PD2017_013 Infection Prevention and Control in Healthcare Settings
- NSW Health Policy Directive (2022) PD2022_032 Medication Handling
- NSW Health Policy Directive (2020) PD2020_049 Clinical and Related Waste Management for Health Services
- South Eastern Sydney Local Health District Policy (2024) SESLHDPD/280 Infective Complications - Mandatory reporting requirements of peripheral intravenous cannula (PIVC) or central venous access device (CVAD) infections in the incident management system (ims+)
- NSW Health Policy Directive (2017). PD2017_032 Clinical Procedure Safety

4.5 References

1. Agency for Clinical Innovation. (2021). Clinical Practice Guide: Central venous access devices (CVAD) Available from: https://aci.health.nsw.gov.au/___data/assets/pdf_file/0010/239626/ACI-CVAD-clinical-practice-guide.pdf
2. Cancer Institute of New South Wales eviQ. (2023). Central Venous Access Devices. Available from: https://www.eviq.org.au/clinical-resources/central-venous-access-devices-cvads/112-central-venous-access-devices#references
3. Clinical Excellence Commission. (2024). High Risk Medications – Anticoagulants. Available from: https://www.cec.health.nsw.gov.au/keep-patients-safe/medication-safety/high-risk-medicines/anticoagulants
4. Cancer Nurses Society of Australia. (2021). Skin Management Algorithm. Available from: https://www.cnsa.org.au/practiceresources/skin-management-algorithm
5. SecurAcath Care and Maintenance. (2022) Available from: https://securacath.com/wp-content/uploads/2022/03/1329-013-RevK-02_21_2022.pdf
6. UpToDate - Young, M and Theodore, H. (2023) Central venous catheters: Overview of complications and prevention in adults. Available from: Central venous catheters: Overview of complications and prevention in adults - UpToDate

5. ABORIGINAL HEALTH IMPACT STATEMENT DOCUMENTATION

- Considerations for culturally safe and appropriate care provision have been made in the development of this Business Rule and will be accounted for in its implementation.
- When clinical risks are identified for an Aboriginal and/or Torres Strait Islander woman or family, they may require additional support. This may include Aboriginal health professionals such as Aboriginal liaison officers, health workers or other culturally specific services.

6. CULTURAL SUPPORT

- For a Culturally and Linguistically Diverse CALD woman, notify the nominated cross-cultural health worker during Monday to Friday business hours.
- If the woman is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017_044-Interpreters Standard Procedures for Working with Health Care Interpreters.

7. NATIONAL STANDARDS

- Standard 3 – Preventing and Controlling Healthcare Associated Infections

8. REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
Oct 2024	1	Eleanor Peirson Close Observation Unit CNC
16.12.24	1	RHW BRGC