



GUIDELINE

CVAD: Central Venous Access Device Bundle

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

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Aim

This guideline outlines the key points associated with the correct insertion, management and removal of Central Venous Access Devices (CVAD) for neonatal patients.

This was developed to align with the PCH [Central Venous Access Devices and Midline Insertion and Management](#) guideline for consistency of care and incorporates the associated [Insertion](#) and [Maintenance](#) Bundles.

The benefits of having this guideline is to reduce the risk of procedural related complications, central line associated blood stream infections (CLABSI), and CVAD associated thromboses.

Specific procedural details for each central line is outlined in the following guidelines:

- [CVAD Femoral Vein](#)
- [CVAD Percutaneously Inserted Central Catheter \(PICC\) / Long-line](#)
- [CVAD Umbilical Artery Catheter](#)
- [CVAD Umbilical Venous Catheter](#)

Risk

Risks associated with CVAD insertion include bleeding or haematoma formation at the site, thrombophlebitis or invasive infection, injury and thrombosis. More specific risks are identified in the associated guidelines.

Abbreviations / Types of CVADs

PICC: Peripherally inserted central catheter

UVC: Umbilical venous catheter

UAC: Umbilical arterial catheter

CVC: Non-tunnelled central venous catheter: femoral or jugular veins

tCVC/Broviac: Tunnelled central venous catheters

CLABSI: Central line associated bloodstream infection

Indications for Use

The indications for insertion of a CVAD can be multifactorial and may include:

- Long-term venous access requirement, where alternative routes are not suitable.
- Safe route of administration for hyperosmolar fluids/drugs; long-term parenteral nutrition; or drugs/fluids that have a high risk of extravasation such as inotropes.
- critically unwell neonates who require multiple infusions
- access for haemodialysis/filtration

Complications

Complications from a CVAD can occur as part of the insertion process or later on during the management phase.

Procedural/Early Complications

- Bleeding - haematoma formation or haemorrhage from the insertion site
- Injury to adjacent structures – for example arterial puncture or injury to viscera
- Catheter fracture resulting in catheter or guidewire embolism

Potential Late Complications

- Phlebitis
- [Central Line Associated Bloodstream Infection \(CLABSI\)](#)
- Thrombosis Appendix 1

CVAD Insertion Bundle

The insertion bundle aims to assist in reducing procedure related complications, improve successful insertion rates, and reduce CLABSI.

Central line insertion is a sterile surgical procedure.

Refer to MR422.01 to complete documentation on insertion

The following aligns with the [PCH Central Line Insertion Bundle Wheel](#) and describes the 7 key points related to the insertion of a CVAD.

1. Appropriate planning

- Determine the appropriate CVAD required -considering the minimum number of lumens required
- Inform parents of the procedure
- Document the reasons for insertion in the patient notes
- Time out - Complete the pre-insertion checklist on MR 422.01
- Focus on reducing personnel and noise exposure throughout the procedure
- Handover pager or phone to second doctor or nursing staff
- Consider the use of a second doctor or nurse for the procedure

2. Routine decolonisation

- Where practical, anti-staphylococcal decolonisation should be performed prior to the procedure. Refer to the Neonatal Monograph [Chlorhexidine 1% Topical Lotion Neonatal](#) and the [Pre-Operative Guideline](#).
- Decolonisation prior to insertion of umbilical lines at birth is not required.

- Infants <32 weeks CGA who require insertion of a PICC do not require additional decolonisation - the routine use of Chlorhexidine lotion during the routine [Chlorhexidine Wash Procedure](#) is sufficient.

3. Surgical Scrub

- The proceduralist must perform a surgical scrub as per [KEMH](#) and [PCH](#) Perioperative Guidelines with [Chlorhexidine Gluconate 4% \(40g/L\)](#) prior to insertion
 - Skinman 90 (90% Ethanol) is also available at PCH

4. Antisepsis

- **> 27 weeks** - use 1% Chlorhexidine solution. Allow to dry for 30 seconds. Wash off excess solution after the procedure with sterile water or saline to prevent skin irritation or chemical burns.
- **≤ 27 weeks** - use Povidone-Iodine 10% solution/swab. Allow to dry for 1 minute then wash off all solution with sterile water or saline before the procedure. This is vital as iodine can be absorbed through neonates immature, non-keratinised skin.

5. Maximal Barrier Precautions

- Sterile gown, eyewear, and surgical mask are required

6. Insertion Checklist

- Refer to Insertion checklist on MR422.01

7. Use of dedicated trolley and pre-packed equipment packs is recommended

Sedation

Sedation may be considered for insertion of CVADs to improve success rate with suggestions provided below. Preterm neonates may not require any sedation. Sucrose administration is usually sufficient. Chloral Hydrate can be considered if required.

- Self-ventilating term neonates – Sucrose and [Chloral Hydrate](#) may be used.
 - The combination of Morphine and Midazolam, even at low doses, can be problematic. [Midazolam](#) alone may be considered in a carefully titrated dose.
- Ventilated Neonates: A combination of [Morphine](#) and [Midazolam](#) should be used to provide pain relief and minimise spontaneous movement.

Refer to associated neonatal guidelines for specific insertion procedures

- CVAD Femoral Vein
- CVAD Percutaneously Inserted Central Catheter (PICC) / Long-line
- CVAD Umbilical Artery Catheter
- CVAD Umbilical Venous Catheter

CVAD Maintenance Bundle

The aim of the maintenance bundle is to reduce late complications associated with CVADs such as infection or thrombosis, as well as to facilitate the early removal of CVADs.

The CVAD must be reviewed each shift and clearly documented on the MR422.01.

This bundle aligns with the [PCH Central Line Maintenance Bundle Wheel](#)

NOTE: Step 7 (discharge support) does not apply to the neonatal population.

1. Focus on hand hygiene

- 5 moments of [Hand Hygiene](#)

2. CVAD competent nursing and medical staff

- Staff handling and accessing CVADs must be deemed competent.
 - Staff to complete the online CVAD training through iLearn. This is mandatory for PCH Neonatology staff.

3. Is the CVAD still required and working appropriately?

- The need for the CVAD to remain in situ must be reviewed at every ward round

4. Dressing and site check

- Complete the checklist on MR422.01 once per shift
- CVAD dressing change is a 2-person surgical aseptic technique procedure (by people deemed competent)
- Dressing changes for 24 or 28G PICC should be minimised to reduce the risk of accidental dislodgement and infection risk
 - Refer to [PCH CVAD Insertion and Management](#) for guidance on dressing changes
- No scissors are to be used for removal of dressings

5. Scrub the Hub

- Needle free ports must be swabbed with 2 % chlorhexidine gluconate in 70% alcohol swab with friction for 20 seconds and allowed to dry for 30 seconds prior to use

6. Central line care

- Minimise changing or “breaking” the line for infusions and medications. If multiple breaks are required, consider rationalisation of medication or the insertion of a [Peripheral Intravenous Cannula](#)
- If an infusion line is disconnected from the patients CVAD, a new infusion and line must be prepared using aseptic technique.

- To maintain lumen patency, central lines MUST have heparinised fluids infusing at all times
- Pressure limits must be set at 50-100mmHg above base line AND pressure monitoring should be numerically displayed at all times.
- Frequency of line changes
 - a. Giving sets and lines must be labelled according to [CAHS Labelling of Injectable Medications and Fluids](#)
 - b. Giving sets must be changed every 96hours. If the concentration of fluids ordered has changed, the giving set must also be changed.
 - c. Infusions prepared on the ward must be changed after 24hours

If occlusion is suspected, report immediately to medical staff for assessment. Refer to occlusion management on MR422.01

CVAD related Thrombosis

- Symptoms of neonatal CVC-thrombosis include:
 - Swelling
 - Erythema
 - Skin discoloration
 - Increased warmth
 - Pain and/or tenderness of the affected leg
 - Venous distension
- Presence of subcutaneous collateral veins
- Superior vena cava syndrome
- Loss of central venous catheter patency
- Prolonged catheter related septicaemia
- Unexplained thrombocytopenia,
- Arrhythmia and hemodynamic instability

Symptomatic CVAD-thrombosis is to be confirmed by Doppler ultrasonography. Once confirmed then consider discussion with haematology to develop a management plan. A guide to therapy is included in Appendix 1

Treatment of CVC-thrombosis is divided into treatment of CVC-thrombosis in veins and CVC-thrombosis in the right atrium ([Appendix 1](#)). In both scenarios, it is necessary to establish whether the thrombosis is deemed high-risk. High-risk CVC thrombosis in veins is defined as thrombosis which compromises an organ or limb. In addition, the risks and benefits of all treatment options versus risks of ongoing thrombosis should be considered in each neonate before treatment is started.

Contraindications for anticoagulation and thrombolysis include invasive surgical procedure(s) in the preceding 10 days, intracranial bleeding in the preceding 10 days, invasive surgical procedure(s) scheduled within 3 days, active bleeding, severe asphyxia, very preterm neonates (< 28 weeks) with high risk of intraventricular haemorrhage and severe thrombocytopenia.

Removal of CVADs

The need for the CVAD must be reviewed at each ward round to facilitate early removal.

The medical team must document the order for removal in the progress notes.

Once removal of a device has been ordered, it must be attended to within 1 hour. Failure to do so must be communicated with the medical team and clearly documented.

Safe removal procedure of CVADs – refer to specific procedural guidelines.

- If resistance felt, do not pull with force
- Tunnelled catheters must be removed by the surgical team

Post-removal care of CVAD site

- If sepsis is suspected, the tip must be sent for culture
- Review insertion checklist and confirm that the length of the CVAD is correct after removal

Complete removal documentation on MR422.01 and in the patient progress notes


Related CAHS internal policies, procedures and guidelines

- [CVAD Femoral Vein](#)
- [CVAD Percutaneously Inserted Central Catheter \(PICC\) / Long-line](#)
- [CVAD Umbilical Artery Catheter](#)
- [CVAD Umbilical Venous Catheter](#)
- CAHS [Central Venous Access Devices and Midline Insertion and Management](#)
- [Central Line Associated Bloodstream Infection \(CLABSI\)](#)
- [Hand Hygiene](#)
- [CAHS Labelling of Injectable Medications and Fluids](#)

Useful resources

- [PCH Central Line Insertion Bundle Wheel](#)
- [PCH Central Line Maintenance Bundle Wheel](#)

This document can be made available in alternative formats on request.

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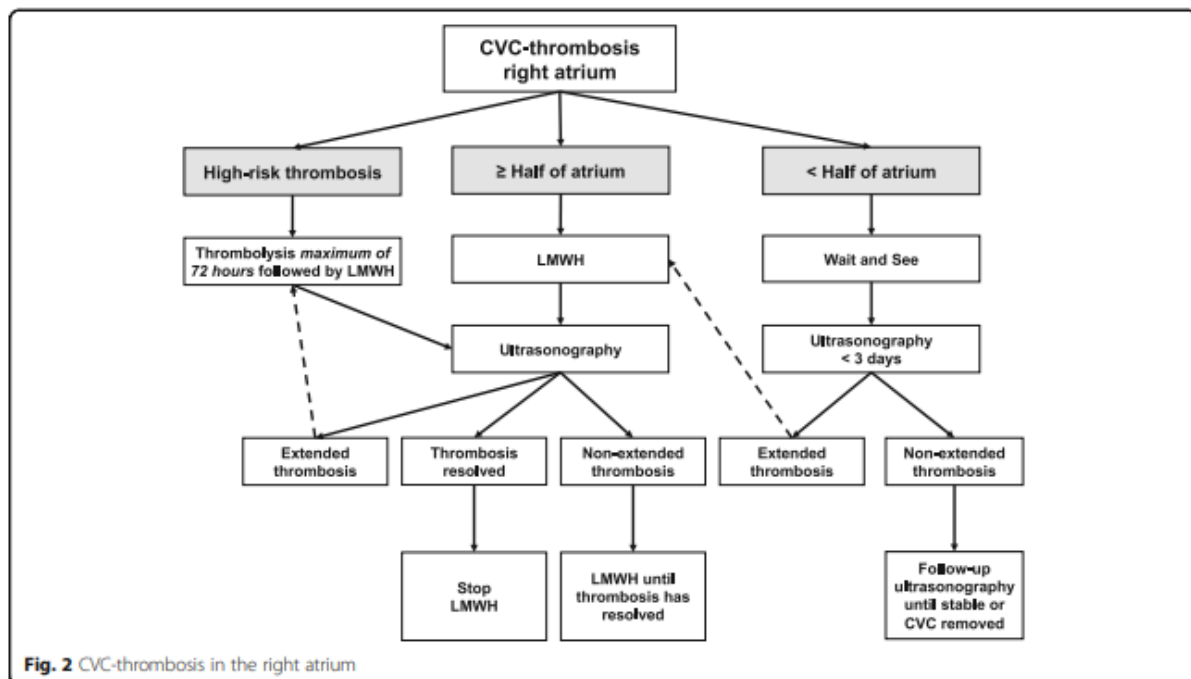
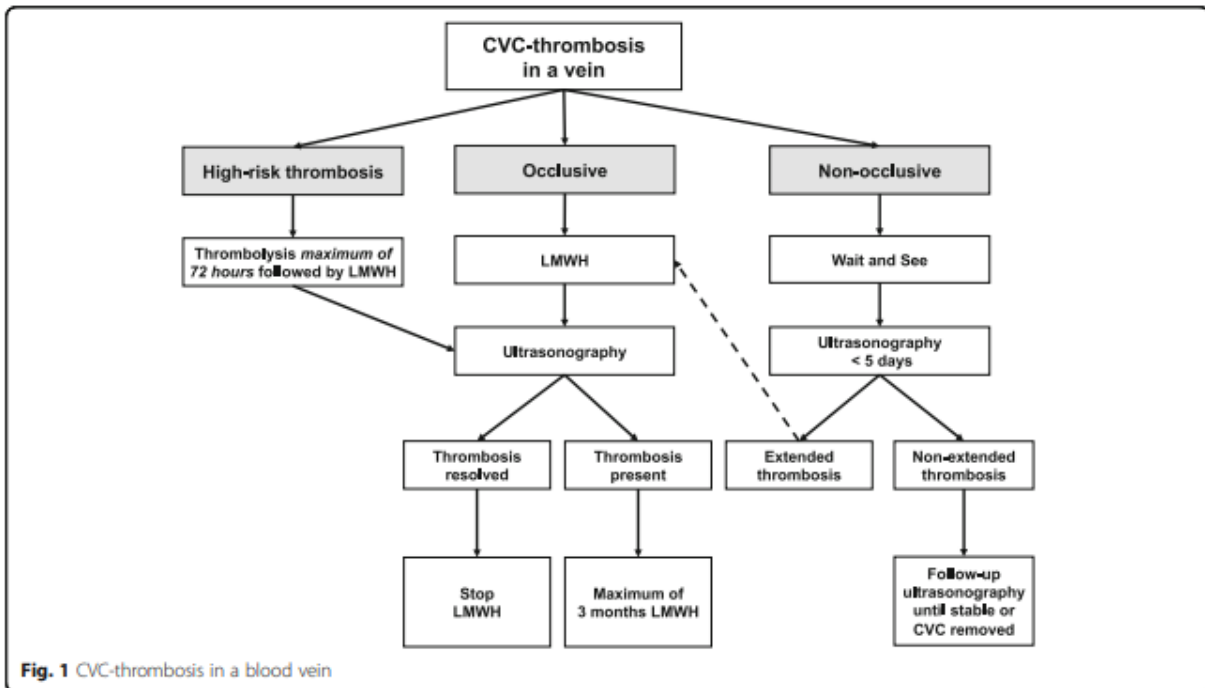


Healthy kids, healthy communities

Compassion
Excellence
Collaboration
Accountability
Equity
Respect

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Appendix 1: Central Line Thrombosis Follow-up



NEOnatal Central-venous Line Observational study on Thrombosis (NEOCLOT), 2018