HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Pediatric Intensive Care Unit		
Document:	Departmental Policy and Procedure		
Title:	Insertion,Removal and management of Central Venous Lines		
Applies To:	All Pediatric Intensive Care Unit Staff		
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1. PURPOSE:

1.1 To provide guidelines governing Central Venous lines (CVL) insertion and maintenance in paediatric intensive care unit.
To outline practical process to prevent Central Line Associated Blood Stream Infections (CLABSI), minimize the risk of complication related to CVL use and maintain its patency.

2. DEFINITONS:

2.1 **Central Venous Line (CVL)** refers to an intravascular catheter that terminates in one of the great vessels (Superior Vena Cava, Inferior Vena Cava, Brachiocephalic, subclavian, internal jugular veins. Femoral or iliac veins, hepatic vein or umbilical vein) that is used for short or long term intravenous administration of medications and fluids, withdrawal of blood or hemodynamic monitoring.

2.2 **Central Line Associated Blood Stream Infections (CLABSI)** refers to a laboratory confirmed primary blood stream infection where a central line or umbilical catheter was in place for more than two calendar days on the date of CLABSI event, with day of CVL placement being day 1 and the line was in place on the date of CLABSI event or the day before.

3. POLICY:

3.1 Pediatric intensive care unit (PICU) physician must be competent and privileged to insert CVL. All staff must be knowledgeable and experienced in the care of CVL. Staff nurse can assist in CVL insertion only after completion of the skill competency on assisting in central venous line insertion.

3.2 PICU multidisciplinary team must discuss indication and daily necessity of CVL.

3.3 CVL insertion must be performed with a written order by physician.

3.4 Informed Consent shall be secured prior to procedure and all CVL forms must be completed and signed/co-signed in Patient's Medical Records including

3.4.1 Informed Consent

3.4.2 Verification and Time Out

3.4.3 CVL Insertion bundle

3.4.4 CVL maintenance bundle

Strict sterile technique is to be adhered throughout the procedure according to hospital infection control and prevention policies .

3.5 CVL must be removed whenever it is no longer needed or if there is evidence of catheter related infection or malfunction .

3.6 All physicians and assisting staff within the sterile field of CVL insertion must do proper hand hygiene, wear a cap, mask, sterile gown and sterile gloves.

3.7 Trained staff is empowered to stop the procedure whenever sterility is breached or there is deviation from hospital infection control and prevention policies.

4. PROCEDURE:

4.1 Pre-insertion:

4.1.1 Verify physician written order for CVL insertion.

4.1.2 Identify patient correctly using two identifiers (four names for the Saudi and complete name for the Non – Saudi and Medical Record Number) and verify with another staff.

4.1.3 Staff nurse serve as a witness in securing informed consent for medical, surgical and interventional procedure by the physician after explanation of the procedure has been provided to and understood.

4.1.4 Under certain emergency circumstances where the consenting guardian is not present, two physicians must sign for the said consent and must be witnessed by two registered nurses

4.1.5 Explain to the patient and parents the importance, benefits and expected complications of the procedure.

4.1.6 Any allergy to latex and chlorhexidine must be documented in patient's medical record, and team must be notified.

4.1.7 Check patient's Complete Blood Count (CBC) and Prothrombin Time (PT), Partial Prothrombin Time (PTT), International Normalized Ratio (INR) results to assess patient's risk for bleeding .

4.1.8 Prepare complete equipment's required for the procedure. All necessary equipment and US machine must be placed nearby and ready to minimize contamination.

4.1.9 Medication required to control pain and sedation must be ordered and prepared before starting the procedure.

4.1.10 Physician will determine the proper insertion site based on patient condition.

4.1.11 Attach to cardio – respiratory monitor or continuous ECG monitoring device to monitor dysrhythmias that maybe noted during insertion as catheter is advanced for internal jugular and subclavian insertion.

4.2 During insertion:

4.2.1 Ultrasound will be used to guide CVL insertion if applicable

4.2.2 Proper positioning for optimum exposure of insertion site.

4.2.3 Staff within the sterile filed must wear complete personal protective equipment (PPE) including surgical mask, surgical cap, sterile gown and sterile gloves.

4.2.4 Site preparation:

4.2.1 Patient's skin must be cleaned with appropriate with appropriate Chlorhixdine wipes according to patient's age and condition before CVL insertion:

4.2.1.1 Use 2% Aqueous Chlorohexidine gluconate for patients less than two weeks or weighing less than one thousand five hundred (1500 gm.) grams.

4.2.1.2 Use 2% Chlorohexidine gluconate in 70% alcohol for patients more than two weeks of age or weighing more than one thousand five hundred (1500 gm.) grams. Allow it to dry to air or per manufacturer's recommendation

4.2.1.3 If there is contraindication for Chlorohexidine (e.g. hypersensitivity); iodine, an iodophor or 70% alcohol can be used.

4.2.1.4 Allow solutions to dry to by air or according to the manufacturer's recommendation.

4.2.1.5 Do not remove hair at the site unless it interferes with dressing adherence. If necessary, clipping is preferable to shaving to avoid skin lacerations and disruption of the epidermal barrier to infection.

4.2.1.6 Cover the patient by sterile large drape from head to toe, expose the insertion site only.

4.2.5 The entry needle should be flushed with 0.9% NACL then slowly advanced (US guided) until there is blood return (non-pulsatile blood return). Physician completes insertion steps and the nurse assist and observes patient's vital signs, ECG and report any abnormality

4.2.6 Be aware of the potential breakage if undue force is applied to the guide wire. Verify that the entire spring – wire guide is intact upon removal.

4.2.7 After insertion flush all lumens with sterile normal saline using 10 ml syringe and check for backflow.

4.2.8 Operator must confirm the proper position of CVL immediately by presence of the back flow and one of the following:

4.2.8.1 Blood gas.

4.2.8.2 CXR for internal jugular or subclavian CVL

4.2.8.3 Analyze waveforms using transducer in case of suspicion (Arterial Vs venous).

Make sure that the catheter is sutured in place to prevent catheter dislodgement

4.2.9 Make sure that the catheter is sutured in place to prevent catheter dislodgement

4.2.10 Apply disinfection cap after suturing CVL.

Dressing after CVL insertion is performed using aseptic technique.

Observe for immediate complications of central line insertion e.g. venous air embolism, cardiac tamponade, catheter embolus/rupture, arterial puncture, cardiac dysrhythmia, catheter malposition, haemothorax, and pneumothorax.

Remove and dispose all used materials in a biohazard bag to prevent spread of infection .

Perform hand hygiene

Primary nurse to document in the nurse's notes the following:

4.1.2.1 Date and time of procedure.

4.1.2.2 Site of insertion.

4.1.2.3 Number of lumens used and catheter size and length.

4.1.2.4 Blood return from each lumen

4.1.2.5 Name of physician performing the procedure.

4.1.2.6 Patient's response to the procedure.

4.1.2.7 Chest X-Ray ordered (if indicated), completed and verified.

4.2.11 Complete the CVL insertion checklist at bedside right after central line insertion.

4.2.12 Physician must indicate in patient medical record that line is ready for use after proper placement confirmation.

4.3 Post insertion and maintenance care:

4.3.1 Maintenance after insertion of CVL, dressing, IV tubing changing, blood sampling and flushing and administration of medication must be done incompliance with DPP

4.3.2 Daily review of CVL necessity must be done during daily multidisciplinary round.

4.3.3 Measure outside length of catheter if applicable. Change in catheter level needs to be reported to physician.

4.3.4 Malfunctioning central venous catheter must be reported immediately to the physician for proper action.

4.4 Changing CVL over guide wire:

4.4.1 CVL may be changed over guide wire only to replace a malfunctioning line if:

4.4.1.1 The CVL is still indicated

4.4.1.2 No evidence of infection

4.4.1.3 The risk of inserting catheter into new site is very high e.g. coagulopathy or severe obesity.

4.4.2 Ensure aseptic technique during CVL guide wire exchange. The old central line is considered non-sterile and should be promptly cleaned before introducing the new guidewire.

4.2.3 Follow the insertion and maintenance guideline for CVL insertion as per hospital policy.

4.5 **Removal of CVL**

4.5.1 CVL must be removed Remove central line as soon as it is not indicated anymore or when there is evidence of catheter related infection or malfunction.

4.5.2 Written order is required for removal of central line
4.5.3 CVL is removed by physician under aseptic technique only after completion of the skill competency on removal of central line.
4.5.4 CVL site must be assessed for signs and symptoms of complications
4.5.5 CVL removal procedure:
- 4.5.5.1 Identify patient correctly using two identifiers (4 names for Saudi/ complete name for Non-Saudi and Medical Record Number.
- 4.5.5.2 Prepare all the needed equipment.
- 4.5.5.3 Explain the procedure to the patient/ parent if present.
- 4.5.5.4 Perform hand hygiene.
- 4.5.5.5 Turn off all infusions and aspirate the lumen when discontinuing continuous medications. Don't flush the line used for inotropes.
- 4.5.5.6 Prepare dressing tray with Chlorhexidine Solution.
- 4.5.5.7 Wear mask, cap, gown and sterile gloves.
- 4.5.5.8 Loosen tape at the catheter site while holding the catheter firmly and applying counter traction to the skin.
- 4.5.5.9 Remove the sutures.
- 4.5.5.10 Inspect the sites for any redness, swelling, exudates or other signs of infection.
- 4.5.5.11 Clean site of insertion by Use 2% Chlorohexidine gluconate in 70% alcohol and let it dry.
- 4.5.5.12 Apply firm pressure over site using sterile gauze for a minimum of 5 minutes. Monitor for bleeding or hematoma formation.
- 4.5.5.12 Inspect completeness of the catheter, make sure no portion was sheared and nicked off.
- 4.5.5.13 Cleanse the site with chlorohexidine solution to site, sterile 4x4 gauze and plaster to make a pressure dressing. Leave occlusive dressing in place 24 – 72 hours.
- 4.5.5.14 Discard all the removed items in the appropriate waste bin.
- 4.5.5.15 Document the procedure and findings in patient's medical record.

5. MATERIALS AND EQUIPMENT:

5.1 Cardio – Respiratory Monitor
5.2 Central Venous catheter Set
5.3 Basic Procedure Set
5.4 Chlorhexidine Skin Antisepsis
5.4 Povidone – Iodine Solution
5.5 Lidocaine 1%
5.6 10 cc Syringe
5.7 3 cc Syringe
5.8 Three – Way Stopcock
5.9 Sterile Gloves
5.10 Sterile Gown
5.11 Surgical Face Mask
5.12 0 Silk Suture
5.13 Sterile Gauze
5.14 Sterile Heparinized Normal Saline/Plain Normal Saline
5.15 Opsite/Plaster
5.15 Alcohol Swab
5.16 Central Venous Pressure Monitoring Materials
5.17 US machine
5.18 Dressing Set
5.19 Surgical Blade

5.20 Adhesive Tape

6. RESPONSIBILITIES:

6.1 Physician
6.2 Nurses

7. APPENDICES:

7.1 N/A

8. REFERENCES:

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9. APPROVALS:

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