HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Paediatric Intensive Care Unit		
Document:	Departmental Policy and Procedure		
Title:	Care of Paediatric Patient with Central Venous Line		
Applies To:	All PICU staff		
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1. PURPOSE:

1.1 To minimize the risk of developing an infection related to the central venous line.
1.2 To prevent complication secondary to the catheter insertion or use.
1.3 To maintain patency of the central venous catheter.

2. DEFINITONS:

2.1 Central Venous Line – is a device designated and used for long – term administration of medications and fluids into central veins. Central venous catheters are inserted at femoral, subclavian, and Internal Jugular Vein (IJV) sites. These devices are preferred in-patient who have no peripheral access and in those who require long – term intravenous access.
2.2 Tissue plasminogen activator or tPA – is a protein that facilitates the breakdown of blood clots. It acts as an enzyme to convert plasminogen into its active form plasmin, the major enzyme responsible for clot breakdown.

3. POLICY:

3.1 The staff must be knowledgeable and experience in the care of central venous catheters (CVC) to prevent the catheter – related complications.
3.2 The procedure must be done under sterile technique.
3.3 The site and catheter must be checked frequently for signs and symptoms of infection, patency and proper placement.
3.4 The physician must be notified immediately for any complication.

4. PROCEDURE:

4.1 Explain the procedure to the patient/parents.
4.2 Check the patient coagulation profile results.
4.3 Perform hand hygiene.
4.4 Prepare equipment on a sterile field.
4.5 Check the insertion site daily by visual inspection and palpation for:
  4.5.1 Erythema.
  4.5.2 Drainage.
  4.5.3 Swelling.
  4.5.4 Suture integrity.
  4.5.5 Catheter position.
4.6 Check the back flow of Central Venous Catheter lumen following each access.
4.7 Flushing and locking.
  4.7.1 Connect all lumens to appropriate Luer – lock line as required. Unused port may be "locked" through injection cap and slide clamps are provided on each port to occlude flow through each lumen during line and injection cap changes. Turn stopcocks to a position that closes the line to air.

4.7.2 Flush the central venous catheter lumen that is not connected to running infusion following each access every 6 hours with Sodium chloride 0.9% (in a 10cc or larger syringe) to confirm patency.

4.7.2.1 Force is never used to flush the catheter. If resistance is met, aspiration may restore the patency; if this is not effective, the physician is notified immediately. If attempts to clear the lumen are ineffective, the lumen is labelled "clotted off" and not to use again.

4.1.1.2 Flush catheter using the push - pause method (injecting 1ml at a time to create turbulent flow) with the designated flushing solution through the needleless injection cap to fill the catheter dead space with the correct volume and solution in order to maintain patency.

4.1.1.3 If any device becomes sluggish or there are problems when using 0.9% sodium chloride then change to heparinized saline (1IU heparin /1ml 0.9%saline) after each use or instil TPA as by doctor order TPA For multi lumen catheter, treat one lumen at a time, Dilution: 1 mg of tPA (Tissue plasminogen activator) in 1ml of NS. Caution: Do not force into catheter, avoid infusion into patient, Procedure: Leave in lumen and wait for 30 minutes, check, if catheter opened, aspirate 3-5ml of blood to remove clot and gently flush with NS. If catheter does not open, leave tPA in the lumen for 2 hours and check again, if catheter opened, aspirate 3-5ml of blood to remove clot and gently flush with NS.

4.1.1.4 Monitor patient clotting factors when heparin is used

4.7.3 Use separate flush and lock syringes for each lumen.

4.7.4 Flush the catheter with Plain Normal Saline after medication administration to deliver any residual portion of the dosage and to prevent interaction of the medications and/or solutions.

4.7.5 Instilled a solution (Plain Normal Saline) to lock a catheter lumen to fill the entire space of the lumen and injection cap. This prevents a backflow of blood that would cause clotting within the catheter.

4.8 Initiating and Changing Delivery System:

4.8.1 Prepare new intravenous (IV) fluids/ solutions and IV tubing's when a new central line is placed.

4.8.2 Check the compatibility of infusions. Certain medications and/or solutions will interact when they are direct contact. The results may be then formation of a precipitate.

4.8.3 Stop infusion for tubing change

4.8.4 Clamp lumen to prevent air embolism or blood loss.

4.8.4.1 Administration sets that are continuously used and not used for blood, blood products or fat emulsions will be replaced no more frequently than every 4 days but at least every 7 days .

4.8.4.2 The intermittent administration sets that not used for blood, blood products or fat emulsions will be replaced within twenty-four (24) hrs.

4.8.4.3 Change (Total Parenteral Nutrition) TPN/Lipid solution, IV tubing and TPN filter every 24 hours with new TPN/Lipid under aseptic technique.

4.8.4.4 Use one lumen only for Total Parenteral Nutrition (TPN)/Lipid due to the potential for Infection.

4.8.4.5 Tubing sets used for the administration of blood products will be replaced every four (4) hours

4.8.4.6 Replace tubing used to administer propofol infusions, when the vial is changed, as per the manufacturer's recommendation, but at least every twelve (12) hours.

4.8.4.7 Needleless components will be changed as frequently as administration sets.

4.8.5 Disconnect tubing or adapter, while maintaining aseptic technique to avoid catheter contamination; connect new primed tubing or adapter.
Unclamp catheter and re – establish IV infusion, if applicable

Central Line hubs, needleless connectors and injection ports will be disinfected before accessing the CL using two percent (2%) chlorhexidine gluconate in 70% alcohol wipe preparation or seventy percent (70%) alcohol swab, to reduce contamination, for not less than fifteen (15) seconds with friction and allowing the solution for air dry

4.9 Aspirate the IV tubing when discontinuing a continuous medication infusions e.g. sedation and inotropes

4.10 Never extract blood, give medication, and flush the line used for inotropes.

4.11 Amount of flushes should be documented in the intake and output monitoring and nurses notes.

4.12 Label the fluid and tubing with date and time.

4.13 Dressing:

- 4.13.1 Set up and organize all the equipment's and supplies needed on the trolley and bring it to the patient's bed side.
- 4.13.2 Perform hand hygiene.
- 4.13.3 Wear non – sterile gloves.
- 4.13.4 Remove gently the old dressing from top to bottom. Do not use scissors or sharp instruments when removing old dressings to prevent cutting the catheter
- 4.13.5 Put on a new pair of sterile gloves.
- 4.13.6 Check the skin for redness, swelling, or any bleeding or other drainage around the site.
- 4.13.7 Call the physician if you notice any of the following:
  - 4.13.7.1 Bleeding, redness, swelling, or discharges at the site.
  - 4.13.7.2 Leaking, suture are remove or the catheter is cut or has cracked.
  - 4.13.7.3 The catheter is coming out of the vein.
  - 4.13.7.4 The catheter seems blocked, or you are not able to flush it.
- 4.13.8 Use a concentration of 2% chlorhexidine gluconate in 70% alcohol Solution to clean the site. Clean the area around the catheter including under the hub. Cleansing should be performed using circular motion from inner to outer. Allow it to dry completely.
- 4.13.9 Note the depth of catheter that has been inserted into the body. Centimetre markers on the external surface of the catheter body can be used. The marker position should be checked periodically.
- 4.13.10 Apply transparent semipermeable dressing on the insertion site. It must be occlusive and water – repellent to protect the area from extrinsic contamination and to keep the site clean of any secretions or drainage from surrounding anatomical site. Use sterile 4 x 4 gauze dressing if bleeding or oozing or patient is diaphoretic.
- 4.13.11 Remove the gloves.
- 4.13.12 Discard all the contaminated items in the infectious waste bin.
- 4.13.13 Wash hands.
- 4.13.14 Label the dressing with date and time.

4.14 Label and designate multiple lumen central venous catheter port according use.

- 4.14.1 Distal port is the largest lumen and close to the heart which can be used for:
  - 4.14.1.1 CVP monitoring.
  - 4.14.1.2 Blood administration.
  - 4.14.1.3 High volume or viscous fluids.
  - 4.14.1.4 Colloids.
  - 4.14.1.5 Medication.
- 4.14.2 Median port:
  - 4.14.2.1 Total Parenteral Nutrition. Reserve one lumen exclusively for total parenteral nutrition (TPN) to prevent catheter – related infections.
  - 4.14.2.2 Medications (only if TPN use is not anticipated)
- 4.14.3 Proximal port:
  - Blood sampling.
  - Medications.
  - Blood administration.

4.15 Proper frequency of dressing change

4.15.1 Sterile gauze dressings/hemostat dressing will be replaced every two (2) days or sooner if dampened, visibly soiled or loosened,

4.15.2 Transparent dressings will be replaced every seven (7) days or sooner if dampened, visibly soiled or loosened

4.15.3 For neutropenic patients, dressing must be changed daily.

4.16 Blood sampling:

4.16.1 Preform hand hygiene.

4.16.2 Observe strict aseptic technique during the procedure.

4.16.3 If fluid is infusing through a single lumen catheter, stop the infusion.

4.16.4 For multi – lumen catheter, stop and clamp all other infusions.

4.16.4.1 Do not stop vasoactive (inotropes) medication infusions. Consider looking for an alternate blood draw site

4.16.5 Disconnect the tubing form the three – way stopcock. Attach a new injection cap sealing into the tubing and set it aside in a sterile field.

4.16.6 Wipe the port (hub) with alcohol swab 70% for 15 sec (twist back and forth) and let it dry completely.

4.16.7 Attach prefilled sterile Normal Saline syringe as ordered into injection port.

4.16.8 Flush Saline slowly into catheter using (push/pause) flushing method.

4.16.9 Withdraw fluid until blood is visualized in the syringe. Slowly withdraw an additional 3 – 5ml of blood and set aside in a sterile field.

4.16.10 Attach empty syringe into the injection port. Withdraw blood for the specimen.

4.16.10.1 Use the proximal port for sampling to reduce the chance for contamination of the specimen.

4.16.10.2 Aspirate slowly to prevent hemolysis of the specimen and/or collapse of the catheter or vessel.

4.16.11 Invert the specimen tube 5 – 6 times for adequate mixing of blood and additive from the tube. Do not shake the specimen tube.

4.16.12 Return to the patient the amount of withdrawn blood.

4.16.13 Flush the line with 3 – 5ml of Normal Saline as ordered using a push/pause flushing method. Wash out any blood from the catheter. Repeat if necessary to clear all remaining blood. Maintain positive pressure, clamp the tubing and catheter then disconnect the syringe.

4.16.14 Replace injection caps that become contaminated with blood.

4.16.15 Wipe the injection port with alcohol swab. Attach administration set and restart the infusion.

4.16.16 Document the amount of blood withdrawn and flushes given in the intake and output chart.

4.16.17 Write nursing care plan according to identified patient's problem through nursing process approach. Refer to nursing clinical practice guidelines.

4.16.18 Fill central venous catheter bundle every 8hr (once per shift).

5. MATERIALS AND EQUIPMENT:

5.1 Mask, Gown, Sterile Gloves/Non – Sterile Gloves

5.2 Dressing Set

5.3 Alcohol Swabs

5.4 2% chlorhexidine gluconate in 70% alcohol Solution

5.5 Povidone – Iodine Solution

5.6 Surgical Blade

5.7 Sterile Gauze

5.8 Adhesive Tapes

5.9 Transparent dressings

5.10 Sterile Normal Saline / Heparinized Normal Saline

5.11 Heparin

5.12 Three – Way Stopcock

5.13 Injection Cap Sealing
5.14 Specimen Tubes.
5.15 Labels for IV Fluid, IV Tubing's and Dressing

6. RESPONSIBILITIES:

6.1 Physician
6.2 Nurses

7. APPENDICES:

7.1 Nurses Progress Notes

8. REFERENCES:

8.1 Kingdom of Saudi Arabia, Ministry of Health Baish General Hospital, 2018.
8.2 Kingdom of Saudi Arabia Ministry of National Guard - Health Affairs ,Central Line Insertion and Maintenance Guidelines (CLABSI Prevention)2022
8.3 Royal Marsden NHS Foundation Trust Policy, Central Venous Access Devices (CVAD) - Policy for Insertion and Care in Hospital 2017 accessed at policy-for-the-insertion-and-care-of-central-venous-access-devices-cvad-in-hospital-royal-marsden-nhs-ft-pdf-4481503169 (nice.org.uk)
8.4 MCH, King Salman medical city, Almadinah helath cluster ,MANUAL FOR PICU ROTATION,,2023
8.5 Kingdom of saudia ,Ministry of health KSA ,HEALTH CARE ASSOCIATED INFECTIONS MOH Surveillance Manual second edition 2023.

9. APPROVALS:

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KINGDOM OF SAUDI ARABIA

وزارة الصحة
Ministry of Health

Hospital: _____ مستشفى:

Region: _____ المنطقة/المحافظة:

Dept./Unit: _____ القسم/الوحدة:

MRN: | | | | | | | | | | رقم الملف الطبي:

Name: _____ الاسم:

Nationality: _____ الجنسية:

Age: _____ ☐ سنة Years ☐ شهر Months ☐ يوم Days العمر:

Date of Birth: ____ / ____ / 14____ H ____ / ____ / 20____ تاريخ الميلاد:

Gender: ☐ Male ☐ Female الجنس:

NURSES PROGRESS NOTES FORM

DATE &TIME	NURSES NOTES (D-data A-action R-response)	REGISTERED NURSE INITIAL WITH ID NUMBER

Note: Write the time in each entry & affix your initial at the end of each paragraph. Document your complete Name, Initial, Job number, Date & Time at the closure of your documentation. Draw a line across empty spaces.

Name: الاسم:	MRN: رقم الملف الطبي:

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