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Protocol for central line care in intensive care unit

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Abstract
A central line is an IV (intravenous) line that goes into a large blood vessel near the center of the body. Central lines are used for giving medications, fluids, IV nutrition and drawing blood. The central line is usually placed in the chest area. Part of the line goes under the skin and enters a blood vessel several inches away. This type of line is called a tunnelled central line. The central line may have a single or double lumen. A single lumen central line has one opening or tube. A double lumen line has two separate tubes within one tubing. There are three veins where we can insert the central line i.e. Internal jugular vein, subclavian vein, femoral vein. [1].

Keywords: Central line, single and double lumen central line, tunnelled central line, internal jugular vein, subclavian vein, femoral vein

Introduction
A central venous catheter (CVC), also known as a central line(c-line), central venous line, or central venous access catheter, is a catheter placed into a large vein. It is a form of venous access. Placement of larger catheters in more centrally located veins is often needed in critically ill patients, or in those requiring prolonged intravenous therapies, for more reliable vascular access. A central venous catheter (CVC), also known as a central line, central venous line, or central venous access catheter, is a catheter placed into a large vein [2, 3].

Sites for insertion of central line
These catheters are commonly placed in veins in the neck (internal jugular vein), chest (subclavian vein or axillary vein), groin (femoral vein), or through veins in the arms (also known as a PICC line, or peripherally inserted central catheters) [2, 3].

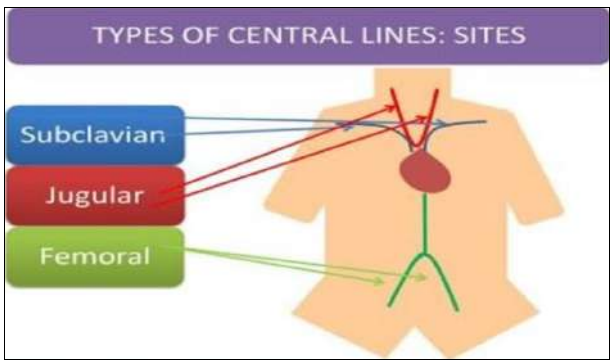

Fig 1: Sites of central line insertion [4]

Medical uses
- **Difficult peripheral venous access:** Central venous catheters may be placed when it is difficult to gain or maintain venous access peripherally (e.g. obesity, scarred veins from prior cannulations, agitated patient).
- **Delivery of certain medications or fluids:** Medications such as vasopressors chemotherapeutic agents, or hypertonic solutions are damaging to peripheral veins and often require placement of a central line. Additionally, catheters with multiple lumens can facilitate the delivery of several parenteral medications simultaneously.

- **Prolonged intravenous therapies:** Parenteral medications that must be delivered for Extended periods of time (more than a few days) such as long-term parenteral nutrition, or intravenous antibiotics are administered through a central line.
- **Specialized treatment:** Interventions such as hemodialysis, plasmapheresis, trans venous cardiac pacing, and invasive hemodynamic monitoring (e.g. pulmonary artery catheterization) require central venous access.[5,6]

Other medical uses
- Administer medication
- Fluids that are unable to be taken by mouth
- Would harm a smaller peripheral line
- Obtain blood tests
- Measure central venous pressure
- Long-term pain medications & Chemotherapy
- Drugs that are prone to cause phlebitis in peripheral veins such as: calcium chloride Chemotherapy, Hypertonic saline Potassium chloride (KCL)

Contraindications

There are no absolute contraindications to the use of central venous catheters. Relative contraindications include:
- Coagulopathy
- Trauma or local infection at the placement site
- Suspected proximal vascular injury [7]

Complications
1. Pneumothorax
2. Vascular perforation
3. Catheter related blood stream infection
4. Occlusion
5. Misplacement
6. Venous air embolism
7. Catheter related thrombosis [8, 9]

Clabsi bundle
1. Hand hygiene/aseptic technique
2. The need for line use has been received and record today.
3. The dressing is intact, not soiled and was changed in the past seven days.
4. Chlorhexidine gluconate 2% is used for cleaning the insertion site during dressing changed.
5. Alcohol hub decontamination is performed before each hub access.
6. Nurse's signature
7. Date of changing central line.

Methodology
- Enter the patient room
- Introduce yourself to the patient.
- Check the non-drug order sheet and CLABSI bundle
- Check the patient's identification and explain the procedure to the patient.
- Arrange the articles.

Equipments required
1. Tray containing
2. Tegaderm
3. Syringe
4. Skin prep solution (2% chlorhexidine gluconate and 70% isopropyl solution)
5. Sterile gauze pieces
6. 70% isopropyl alcohol swab
7. Sterile tray
8. Sterile gloves
9. Clean gloves

- Perform hand rub
- Wear clean gloves
- Remove the old dressing and inspect the surrounding skin for any kind of inflammation, infection and cyanosis.
- Remove old gloves and perform hand rub
- Assistant nurse will open the first flap of sterile tray and pour the sterile gloves in sterile field now the assigned nurse wears the sterile gloves and the other flap of sterile tray will be open by assigned nurse.
- Assigned nurse will spread the cut sheet in the central line area and the assistant nurse will pour skin prep solution, gauze pieces and tegaderm in sterile tray.
- Now the assigned nurse will take artery forceps make mitten and dip in the skin prep solution.
- Now clean the insertion area for 30 seconds.
- Remove cut sheet
- Secure the insertion area with the help of tegaderm.
- Take the gauze piece dip in skin prep solution and clean the lumens, single lumen cleans with single gauze piece.
- Take alcohol swab and clean the hub 15 clockwise and 15 anticlockwise.
- Now cover the central line with the help of clean cloth.

After care
- Discard the waste according to BMW policy.
- Remove the gloves
- Perform hand washing.
- Do documentation in nurses notes and CLABSI bundle.

Key points to remember
- Maintain the sterile technique throughout the procedure
- Always follow CLABSI (Central line associated bloodstream infection) bundle while cleaning central line.
- Use skin prep solution for cleaning insertion site and alcohol swab for cleaning the hub part.
- Once in a week provide central line care.
- Always inspect the insertion skin for integrity and assess for any sign of complication.

Caring for a central line at home
- A home care infusion company will give you the supplies needed to care for the central line at home.
- The central line is flushed daily to keep it from clotting. You are taught how to do this by a nurse from your home care infusion company.
- Change the dressing and cap weekly. Also change the dressing if it comes loose and is no longer covering the exit site. A nurse will do this until you are trained to do so.
- There may be some bleeding after surgery and a dressing change may need to be done sooner than one week.

- Keep the central line safe by using the securing device supplied by the home care infusion company and avoid tugs or pulls on the line.
- Anyone else caring for your child, such as babysitters and teachers, will need to learn central line safety and emergency care [1].

Preventing a problem with a central line

- Wash your hands before doing any central line care and wear gloves.
- Always keep a clean and dry dressing over the central line site.
- Follow the instructions for cleaning the cap and using sterile equipment.
- Avoid tugs or pulls on the central line. Take extra care when removing clothing to avoid a pull or tug.
- Secure the central line to your child's body with the clips. For younger children, use one-piece outfits to cover the central line.
- Always keep scissors and all sharp objects away from the central line.
- If the central line is hard to flush, do not try to force it [1].

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