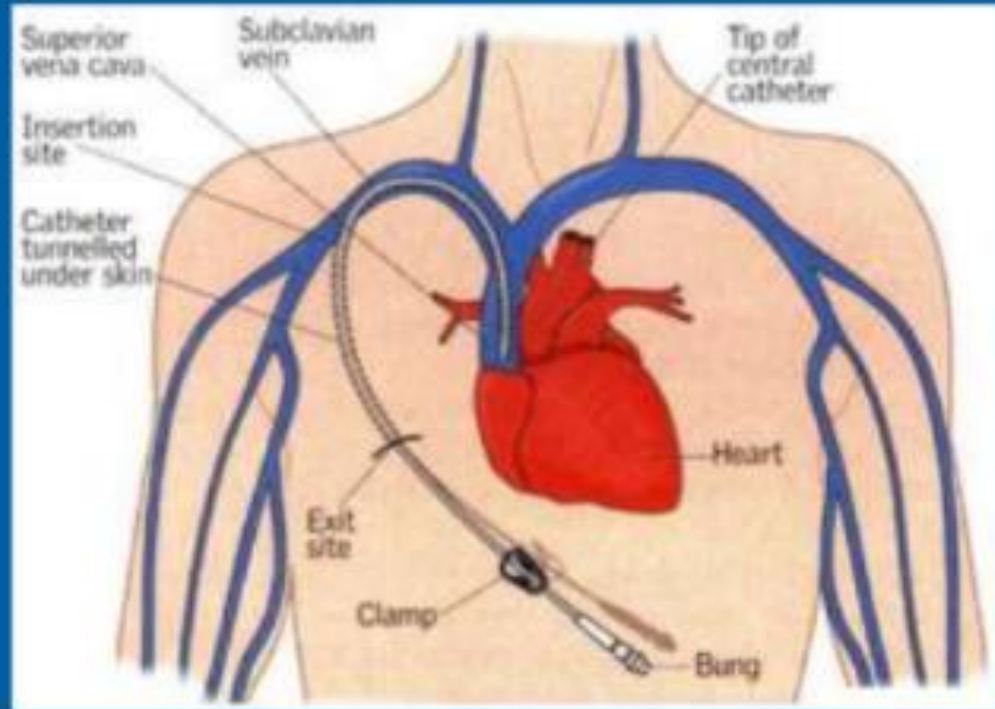


CENTRAL VENOUS CATHETER (CVC)

Surgery

2nd stage



Dr. Bashar Alaaraji

DEFINATION:

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.

REGULAR SITES :

Catheters can be placed in veins,

- Neck (internal jugular vein),
- Chest (subcalvin vein or axillary vein),
- Groin (femoral vein),
- Peripherally inserted central catheters.(PICC)

MEDICAL USES

- Administer medication
- Fluids that are unable to be taken by mouth
- Would harm a smaller peripheral lines
- Obtain blood tests
- Measure central venous pressure

INDICATIONS:

- Long-term intravenous antibiotics, parenteral nutrition in chronically ill persons
- 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)
- Frequent blood draws
- Monitoring of the central venous pressure (CVP).

CENTRAL LINE LUMEN TYPES

- Single



- Double



- Triple

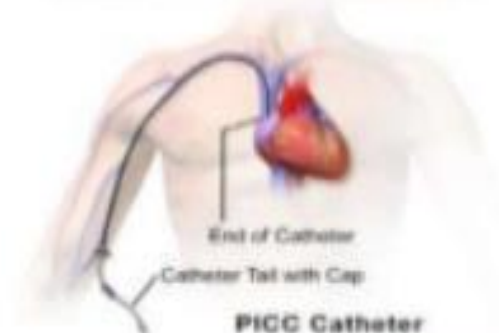


CATHETER TYPES

- Tunneled - Catheters



- PICC Line



- Non Tunneled - Catheters



- **TUNNELED – CATHETERS:**

- PREFERABLE SITES:**

- Neck (internal jugular)
- Groin (femoral),
- Liver (transhepatic),
- Back (translumbar). The catheter is tunneled under the skin.

- INDICATIONS:**

- Chemotherapy
- Nutrition and
- Fluids
- Blood samples

- **NON TUNNELED – CATHETERS:**

- PREFERABLE SITES:**

- First choice: right internal jugular vein
- Second choice: femoral vein
- Third choice: left internal jugular vein
- Last choice: subclavian vein with preference for the dominant side.

- INDICATIONS:**

- Increasing age of patients initiating hemodialysis
- Increasing number of comorbid conditions including significant vascular disease.
- Urgent renal replacement therapy (RRT).

❑ CONTRA INDICATIONS FOR TUNNELED AND NON-TUNNELED CATHETER.

- Local cellulitis
 - Low platelet counts
 - Local infection
 - Avoid in raised intracranial pressure- aim for a femoral approach if required
 - Patient non-compliance
- Systemic sepsis is an absolute contraindication for central venous access via tunneled catheter because it can lead to line infection.

❑ COMPLICATIONS :

- Bleeding
- Infection
- Puncture of adjacent structures (such as other veins or arteries)
- Air embolism (air in the veins)
- Collapse of the lung (pneumothorax)
- Bleeding into the chest (hemothorax)
- Catheter breakage (when it is being removed)

❑ PATIENT EDUCATION :

- Explain the procedure to the patient and family members.
- Explain the need of central line and benefits, risk and complications.

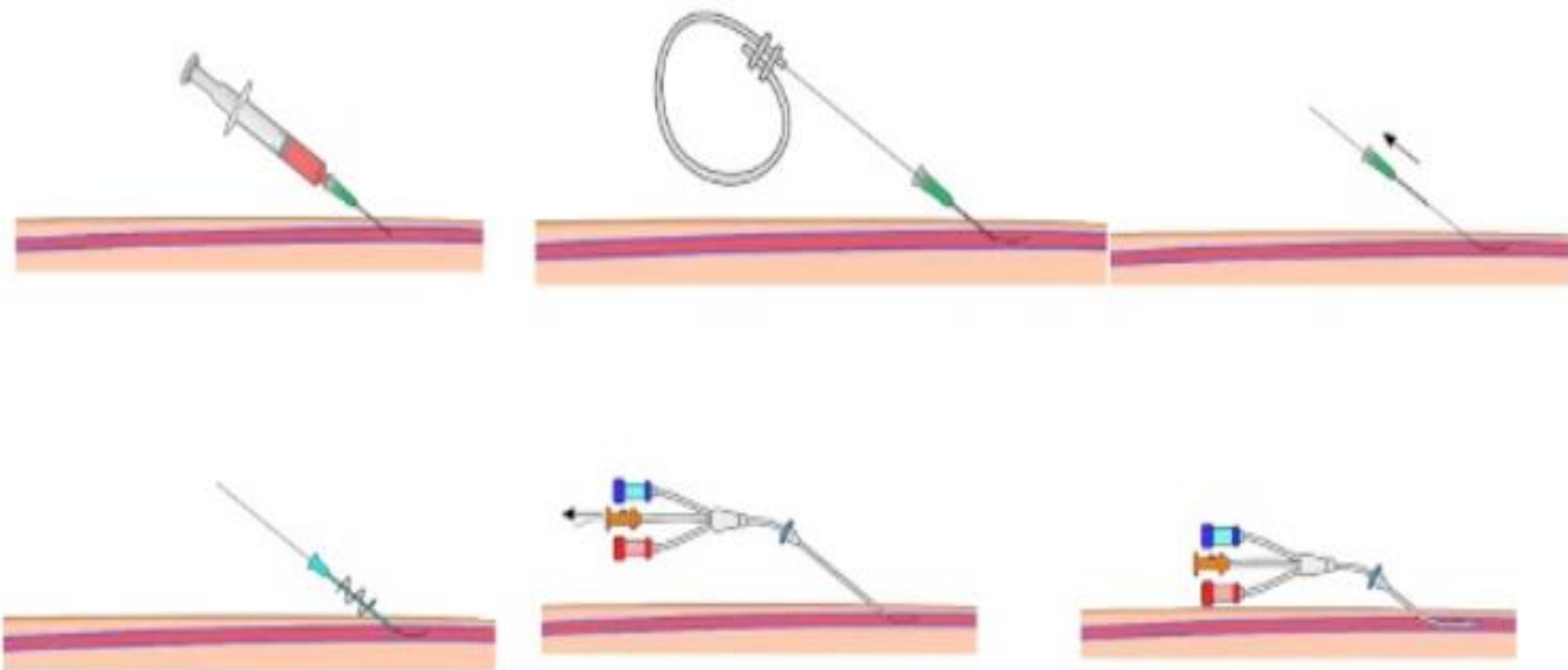
❑ Equipment required for central line (central venous catheter) insertion

- Sterile trolley(cvp tray)
- Sterile field, gloves, gown and mask
- Central line kit
- Saline flush
- Chlorhexidine
- Lignocaine (4ml (2 vials) of 2% is reasonable)
- Suture
- Scalpel
- Central line fix



SELDINGER TECHNIQUE:

The Seldinger technique, also known as Seldinger wire technique, is a medical procedure to obtain safe access to blood vessels and other hollow organs



PRE-PROCEDURE

- Consent patient if conscious otherwise document why the procedure is in the patient's best interests.
- Consent should include.
 - Infection, bleeding (arterial puncture, haematoma, haemothorax), pain, failure,
- Set up sterile trolley.
- Position patient with head down if they can tolerate it, with head facing away from side of insertion
 - This ensures maximum venous filling
- Having a nurse or assistant is helpful.

PROCEDURE FOR CENTRAL LINE (CENTRAL VENOUS CATHETER) INSERTION

- Wash hands and wear sterile gown and gloves
- Clean the area and apply sterile field. Make sure to have some spare gauze swabs ready.
- Apply sterile sheath to the ultrasound probe
- Confirm anatomy
- Under ultrasound guidance insert lignocaine cutaneous, subcutaneously and around preferred site .
- Whilst lignocaine has time to work flush all lumens of the line and then clamp all lumens except the Seldinger port
- Ensure caps are available for the lumens
- Under ultrasound guidance take Seldinger needle attached to syringe and insert into the internal jugular vein
- When blood is freely aspirated remove syringe and immediately inset Seldinger wire. This should pass easily
- Keeping hold of the inserted wire, remove the needle. Ensure the wire stays in the vein as you do this.

CONFIRM ANATOMY



HAND WASHING

Five steps to prevent central line infections

1 Rub hands using soap or alcohol rub for 30 seconds



2 Wear sterile gloves, full head and gown



3 Completely cover the patient with sterile drapes fixed along the catheter to the gown/trapeze



4 Cover the insertion site on the patient's skin with antiseptic and sterile drape



5 Remove catheter when they are no longer needed



for



USG GUIDED



INSERTING GUIDE WIRE



Continue....



CONFIRM WITH BLOOD DRAW



- Use scalpel to make an small incision in the skin (approx 3mm). This should be done cutting away from the wire so as not to damage it
- Pass the dilator over the wire and gently but firmly dilate a tract through to the internal jugular.
- At this stage there may be some bleeding so ensure to have some swabs ready
- Remove the dilator and pass the central line over the Seldinger wire. Do not advance the line until you have hold of the end of the wire
- Once the central line is in place, remove the wire
- Aspirate and flush all lumens and re clamp and apply lumen caps
- Suture the line.
- Dress with a clear dressing so the insertion point can be clearly seen

FLUSH THE LINE



SUTURING



SECURING THE LINE



□ DOCUMENTATION

- Patient is educated about the need
- Site assessed and marked
- All lumens clamped
- Inserted by Physician , assisted by
- Tip position confirmation via fluoroscopy OR chest X-ray
- Date and time of insertion , assess the site for extra bleeding.
- Anatomical location .
- Catheter depth according to catheter reference.



□ CVP MONITORING

Central venous pressure (CVP) is the blood pressure in the venae cavae, near the right atrium of the heart. CVP reflects the amount of blood returning to the Heart and the ability of the heart to pump the blood back into the arterial system.

- The **normal range** for **CVP** is 0 to 5 mm H₂O



Thank you ...