

VENOUS ACCESS DEVICES

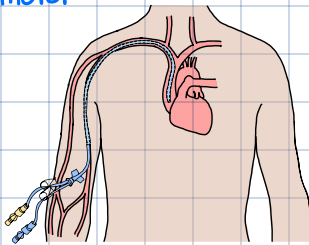
venous access devices

Central Venous Access Device (CVAD)

- Long term IV therapy
 - > chemo, fluids, nutrition, vesicants, & blood products
 - > meds \bar{c} pH < 5 or > 9, osmo > 600
- Lumen terminates in chest-vena cava (SVC or IVC) or right atrium
- Lower vessel irritation, inflammation, & sclerosis
- Radiopaque
- 4 types
 - 1) Peripherally Inserted Central Catheter (PICC line)
 - 2) Nontunneled central line
 - 3) Tunneled central line
 - 4) Implanted ports

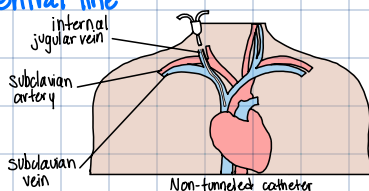
Peripheral Inserted Central Catheter

- AKA: PICC cath or PICC line
- Single or multi-lumen
- Inserted peripherally (basilic or cephalic vein @ AC) by trained RN
- Used from 7 days to several months
- X-ray for confirmation of placement
- **USE:** IV fluids, medications, blood & blood products, TPN, chemo
- incompatible drugs can be run through the same PICC in separate ports
- No BP or sticks in PICC arm
- Some brands lock \bar{c} normal saline only
- Important nursing responsibilities
 - > maintain the dressing
 - keep secured down
 - keep the site sterile
 - > maintain the patency of the line
 - flush at intervals as ordered
 - assess for patency every shift
- Keep secured
 - > less likely to be displaced
 - > minimize movement of the hub
 - > prevention of infection
- ***Don't advance if it migrates out.***



Non-tunneled, multilumen central line

- AKA: triple lumen catheters
- 1-4 lumens
 - > each has a separate port \bar{c} designated function



- > exceptions are made \bar{c} lumen failure
 - use 5-10 days
- Triple lumen catheter (TLC) - 3 lumens
 - > distal (lbg) - blood admin, CVP readings
 - > medial (lbg) - TPN
 - > proximal (lbg) - IVF & blood draw, meds

Insertion of central line

- Before
 - > informed consent
 - > assess for allergies
- During
 - > assist MD, APN
 - > sterile procedure/field - usually a standardized kit
 - > 10° Trendelenburg (if possible), R side
 - > turn head
 - > valsalva maneuver (as appropriate)
- After
 - > confirm placement
 - > flush lumens **ONLY AFTER** placement is confirmed
 - > sterile dressing
 - > heparin lock

Central line dressing

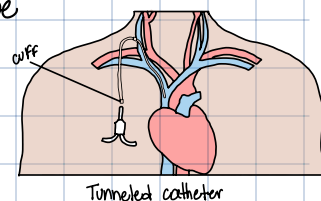
- sterile dressing changes
 - gauze - Q 48hrs, PRN
 - transparent - Q 7 days, PRN
- ***CRITICAL POINT:**
 - > mask **MUST** be worn

Central line Complications

- infection
- hematoma/bleeding
- pneumothorax/hemothorax
- cardiac dysrhythmias
- pericardial tamponade
- air/catheter embolism
- pulmonary embolism

Tunneled Central Venous Catheters

- Surgically tunneled through sub q tissue in chest
- terminates in the superior vena cava
- lasts months to years
- one or more lumens



- Hickman, Broviac, Groshong*

- Unique features:

- > Groshong - valve

- no heparin needed to lock

- > Broviac - smaller than Hickman, pediatrics, heparin lock

- All have a Dacron cuff

- > antimicrobial barrier & stabilizes

- Surgical removal required for all

Subcutaneous Implanted Ports

- AKA: Port-a-cath, Infuse-a-port, Mediport

- Surgically inserted into sub q pocket

- Single & dual port

- long term & complex IV therapy, dialysis & dual

- maintenance: flush Q 28 days

- heparinize every 4 wks

- lasts 2-3 years

- Huber needle - noncoring

Pheresis/Dialysis Catheters

- AKA: Quinton cath or Perm cath (tunneled), & Vascath (nontunneled)

- two lumens

- > blue = venous

- > red = arterial

- inserted at bed side or surgical

- only to be used for dialysis UNLESS emergency situation

- heparin lock

- may end in the superior vena cava (SVC) (short term) or right atrium (long term)

- Long term = cuffed catheter

- > > 1 wk

- > Perm cath or Quinton

- Short term = noncuffed

- > < 1 wk

- > Vascath

Things to remember about using central lines...

- DO NOT use scissors around any CVAD

- ALWAYS use 10mL syringes for obtaining samples or flushing

- Prepare syringes/supplies in advance

- if using heparin lock = 100 units/mL (dialysis cath = 1,000 u/mL)

- NEVER forcibly flush a CVAD

- It is important to keep central lines patent

- > Know your institutions policy for flushing & locking central lines

- Occluded catheters can result in:

- > interruption of therapy

- > infiltration of fluid into tissues

- > infection (clot can develop a biofilm that harbors bacteria)

- When drawing blood from central line, aspirate & discard 5mL of blood prior to obtaining sample UNLESS YOU ARE DRAWING A BLOOD CULTURE

- for blood culture, change cap, then use first drawn blood for the culture

- Anticipate need for blood draws to minimize # of times you access a central line

- Always flush w/ saline before & after giving medications

- SASH

- > if using a heparinized line to give an medication, remember to draw off heparin, then "SASH"

- Saline

- Administer med

- Saline

- Heparin

- Use positive pressure when flushing CVAD

- > clamp the line while instilling the last 0.5 cc of flush

- Use needless connectors to cap ports

- > decreases risk of needle sticks

- > maintains a closed system

- > decreases risk of air embolism

- > some have aseptic barriers integrated into them

- Prevention of central line infections!

- > HAND HYGIENE!

- > sterile technique dealing w/ line

- > scrub w/ chlorhexadine/alcohol when accessing

- > avoid using femoral vein for central lines

- > immediate notify MD if site looks infected

- > culture drainage at site - cath tip???

- > remove central line when no longer needed

- Infection control

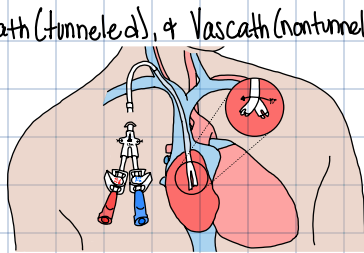
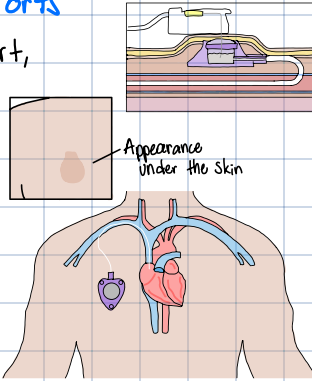
- > Central-line associated bloodstream infection (CLABSI)

- > disruption of the integrity of the skin

- > infection may lead to sepsis

- Central line bundle

- > Hand hygiene



- > maximal barrier precautions upon insertion
- > chlorhexidine skin antiseptics
- > optimal catheter site selection, \bar{c} subclavian vein as the preferred site for non-tunneled catheters
- > daily review of line necessity \bar{c} prompt removal of unnecessary lines

- Think outside the bundle!

- > CVL care

- change transparent dressings every 7 days, those you cannot visualize the site i.e. gauze dressing, change every 24 hrs
- change tubing every 96 hrs (4 days) \bar{c} caps every 7 days
- cleanse caps prior to tubing change, IVP medication or flushing \bar{c} alcohol swab

- Flushing

- > when flushing multiple lumens

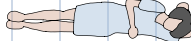
- DO NOT use the same syringe for flush
- properly prep luer-lock injection site - all the time
- use positive pressure flush to keep line from clotting
- meticulous technique important...
- one slip up can introduce pathogens directly into your pt's bloodstream!!!

- Prevention of air embolism

- > luer-lock connections

- > purge air from lines, connections
- > positioning site above heart \bar{c} valsal va \bar{c} removal as appropriate
- > know signs of air embolism
- > if suspected air embolism

- nurse should immediately place the pt in the **LEFT LATERAL DECUBITUS** position if not contraindicated



Parenteral Nutrition

- Common indication for a central line (>10% dextrose requires CVAO)
- Used for clients \bar{c} GI abnormalities that prevent enteral nutritional
- Total Parenteral Nutrition (TPN) contains dextrose, amino acids, \bar{c} lipids
- Also may contain electrolytes, trace elements, \bar{c} insulin (b/c the dextrose will sky rocket blood sugar)

- TPN

- > ordered by MD \bar{c} mixed by pharmacy
- > refrigerate - remove for 30 min, 60 min prior to giving
- > verifying order prior to administering!

- TPN orders

- > contents of drip
- > rate

- > labwork monitoring

- > accucheck monitoring

- > what to do if discontinued

- Parenteral Nutrition

- > Aseptic technique!

- > Filters

- > watch IV site for infection

- > monitor blood glucose

- may have order to add insulin to bag

- sliding scale insulin

- > Monitor rate!

- > nothing added to PN line except lipids