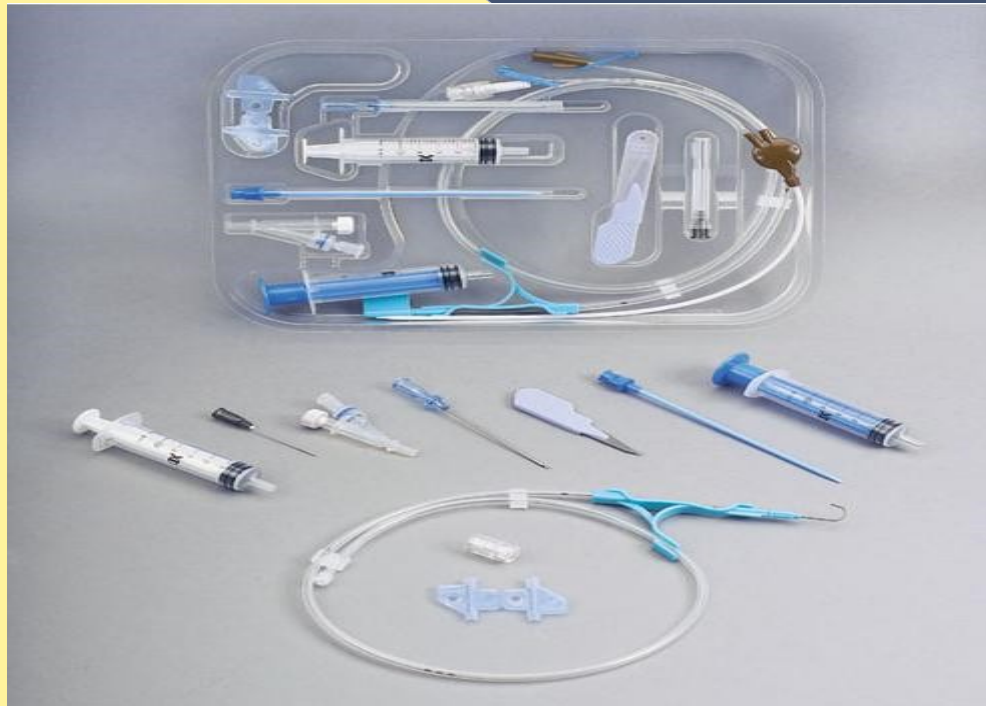
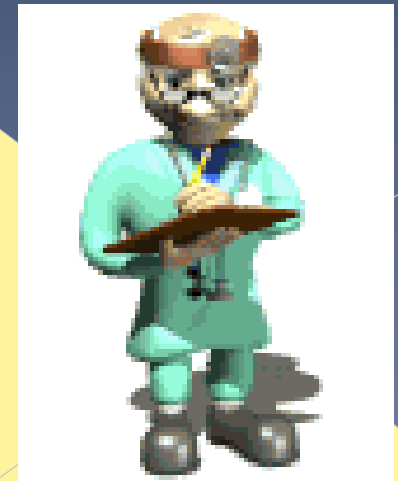


CENTRAL VENOUS CATHETERISATION



INDICATIONS

- ▶ Measurement of central venous pressure (CVP)
(E.G. those with hypotension not responding to normal management, requiring infusion of inotropes)
- ▶ For long term administration of drugs for pain, infection, cancer or to supply nutrition.
- ▶ Venous access for IV fluids or antibiotics or a peripheral site is unavailable/unaccessible
- ▶ Haemodialysis



CONTRAINDICATIONS

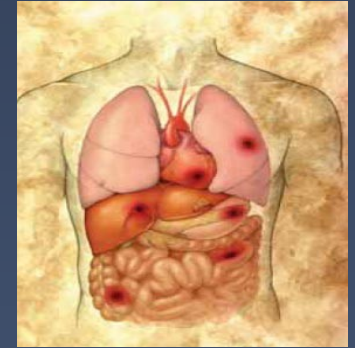
- ▶ Patients undergoing thrombolytic or anticoagulative therapy
- ▶ Bleeding disorders
- ▶ Vasculitis
- ▶ Distorted local anatomy
- ▶ Overlying skin infections(dermatitis), burns
- ▶ Uncooperative patient



COMPLICATIONS

- INFECTIOUS

Sepsis (also septic arthritis, osteomyelitis)

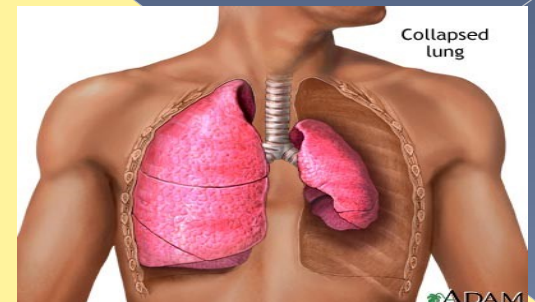
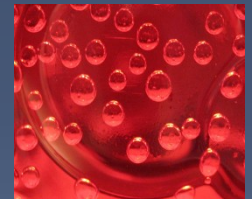


- VASCULAR

Air embolism, blood clot, hematoma, arterial puncture

- OTHERS

PNEUMOTHORAX, hemothorax, arrhythmias, nerve injury



LOCATIONS of CVC

- ◉ INTERNAL JUGULAR VEIN
- ◉ SUBCLAVIAN VEIN
- ◉ FEMORAL VEIN

Length of catheters

- 15cm catheters for subclavian and internal jugular lines, and 60cm catheters for femoral line

EQUIPMENT USED:

- Patient on a tilting bed, trolley or operating table
- Standard multiple lumen kit
- Guide wire
- Sterile gloves
- Sterile gown
- Drapes
- Disinfectant (Povidone-iodine solution/ chlorhexidine)
- Suturing needle
- Scalpel
- Local Anaesthetic (lidocaine)
- Sterile saline flush





A= small syringe and vial of 1% Lidocaine (L.A)

B= guide needle

C= IV syringe with catheter attached- D

E= Disinfectant sponge



Triple lumen catheter

Dilator



Guidewire: J-shaped tip to reduce risk of vessel perforation

TECHNIQUE

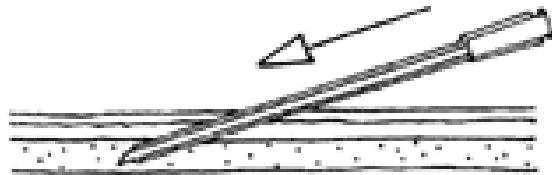


- ▶ SELDINGER TECHNIQUE (most common)
- 1) Use guide needle to locate the vein
- 2) Wire threaded through needle
- 3) Remove needle
- 4) A dilator is passed over the guide wire
- 5) Dilator is removed and catheter is passed over wire and wire is removed
- 6) Catheter secured in place

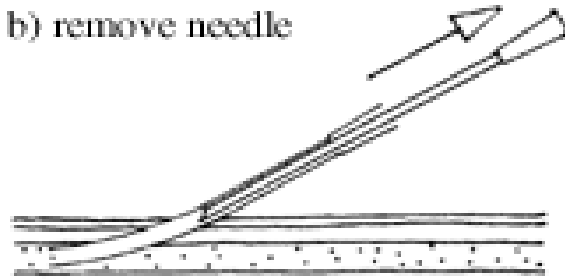
Allows larger catheters to be placed in the vein after the passage of appropriate dilators along the wire and a small incision in the skin at the point of entry.

A. Catheter over needle

a) insert into vein

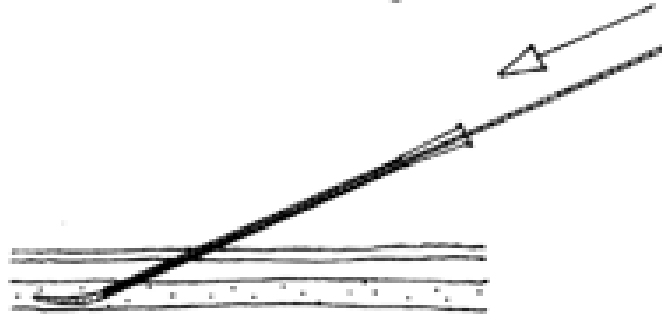


b) remove needle

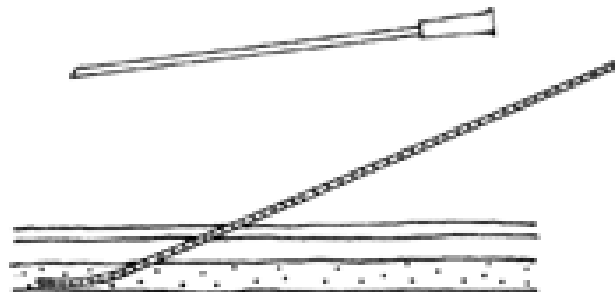


B. Catheter over guidewire (Seldinger technique)

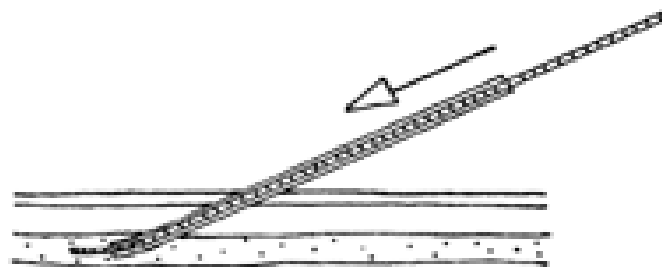
a) insert wire through needle in vein



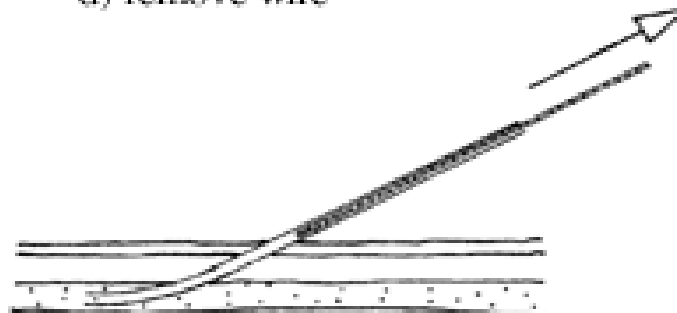
b) remove needle



c) pass catheter over wire



d) remove wire



Different methods of insertion

Fig 1

GENERAL PRINCIPLES

- Obtain informed consent and explain risks and benefits of procedure
- Optimal patient positioning and cooperation, make sure patient is comfortable
- Take your time
- Sterile technique
- Local anaesthetic should be used
- Always have a hand on your wire
- Aspirate while advancing as you withdraw the needle slowly
- Withdraw needle to the level of the skin before redirecting the angle
- Don't poke yourself with the needle
- The tip of the catheter can lie in either the superior or inferior vena cava (SVC or IVC) or into the right atrium (RA).

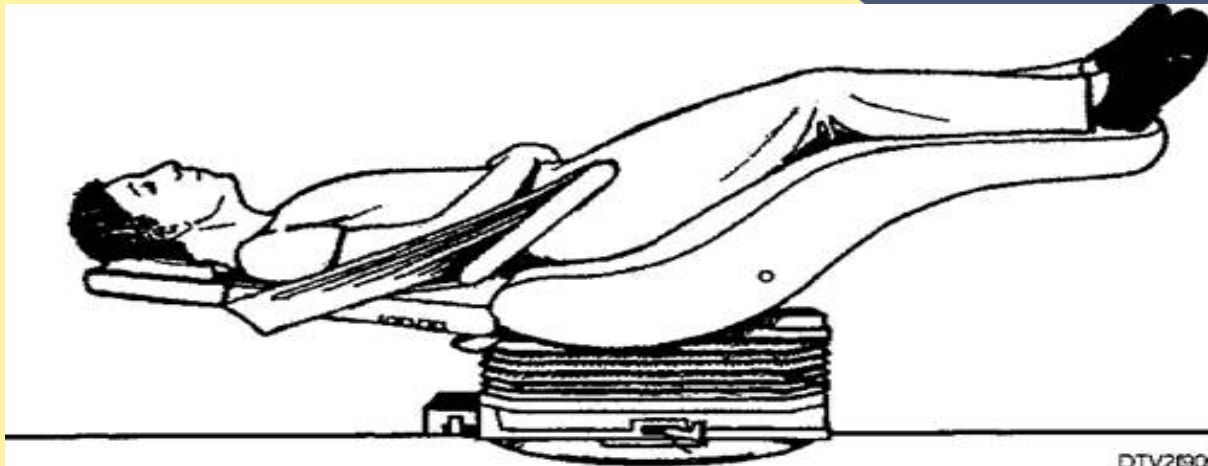


INTERNAL JUGULAR APPROACH

1. POSTIONING :

TRENDELENBURG POSITION

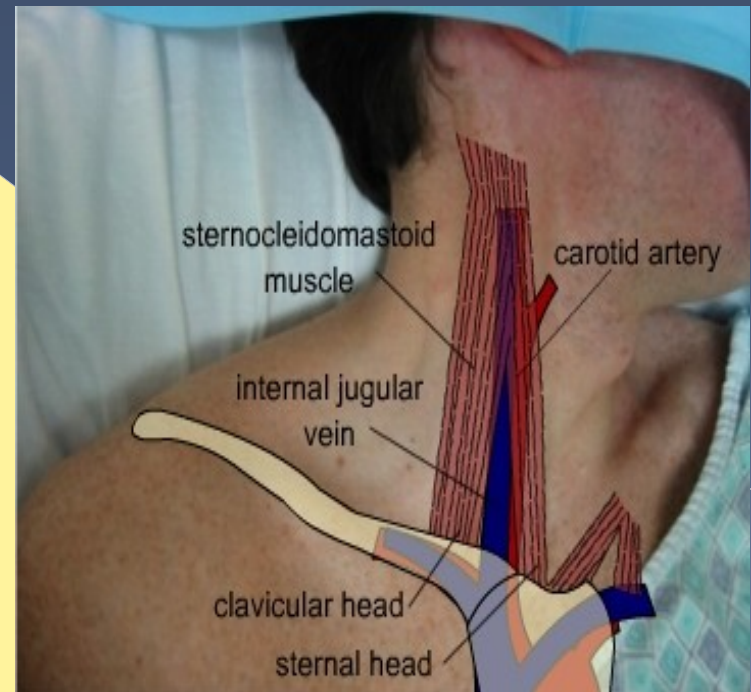
- Patient supine on surface inclined 45 degrees, head at the lower end and legs flexed over upper end.
- (This distends the central veins and prevents air embolism)
- Head turned to opposite side of central venous line
- Stand at the head of the patient



DTV21905

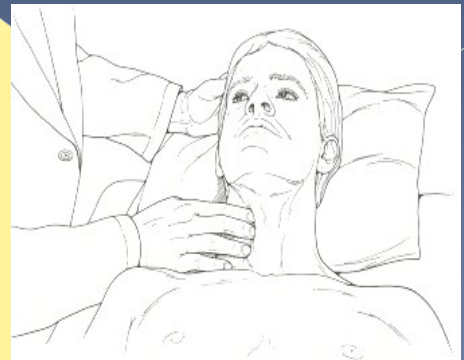
LOCATING AND ACCESSING VEIN

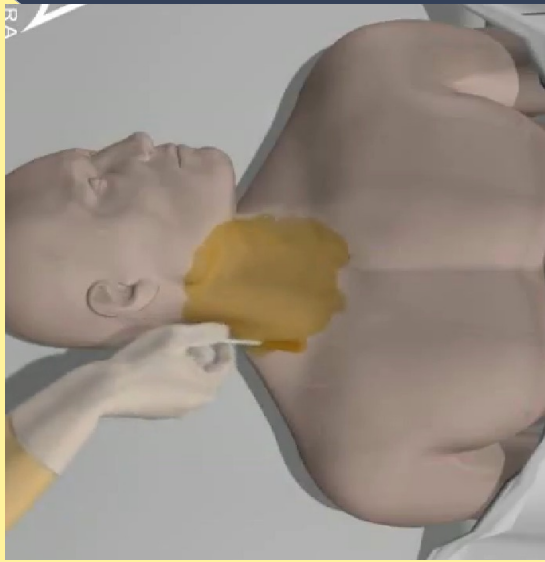
- Ultrasound and landmarks can be used
- IJV is between the clavicular and sternal heads of the sternocleidomastoid muscle
- Point of needle insertion is midway between sternal head of SCM and mastoid process behind ear



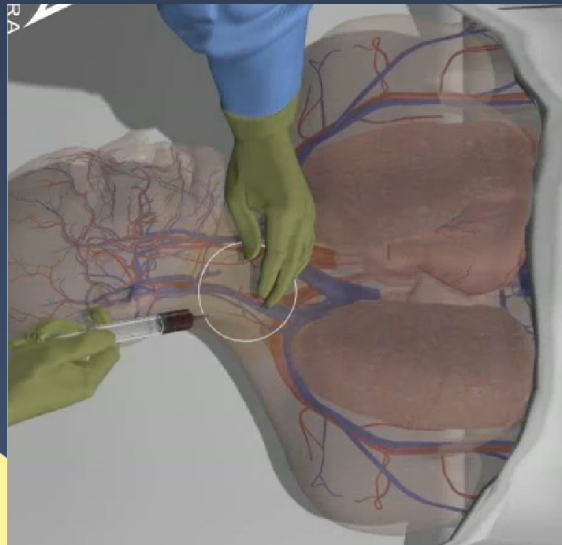
PROCEDURE

- Disinfect area , apply L.A and fenestrated drape
- Place three fingers on carotid artery
- Place needle about 45 degrees to the skin, lateral to the carotid artery
- Direct needle in sagittal plane angled towards feet
- Vein should be 1-1.5 cm deep, avoid deep probing in the neck
- Seldinger technique used

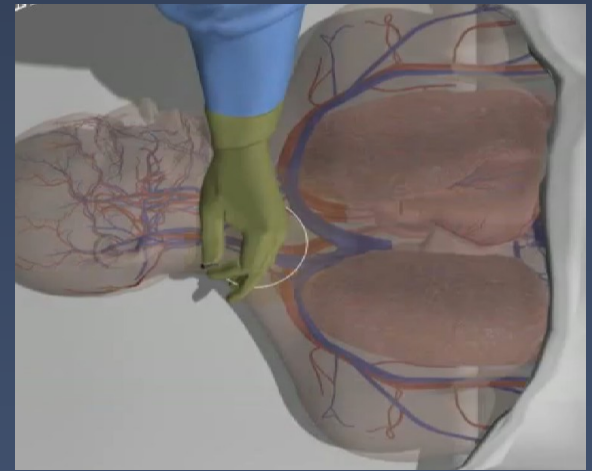




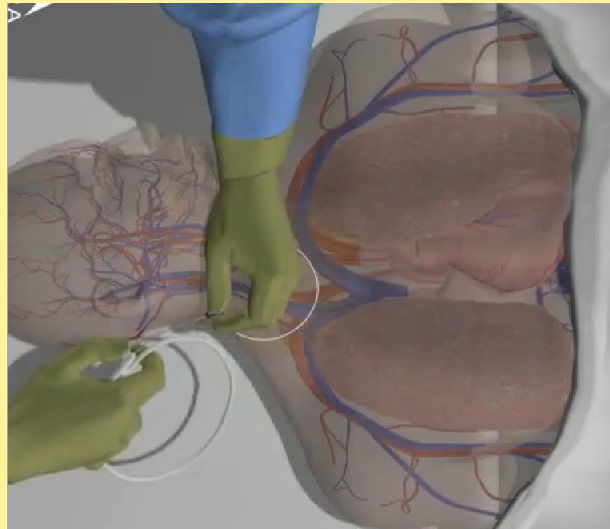
1. Disinfection, L.A and sterile drape



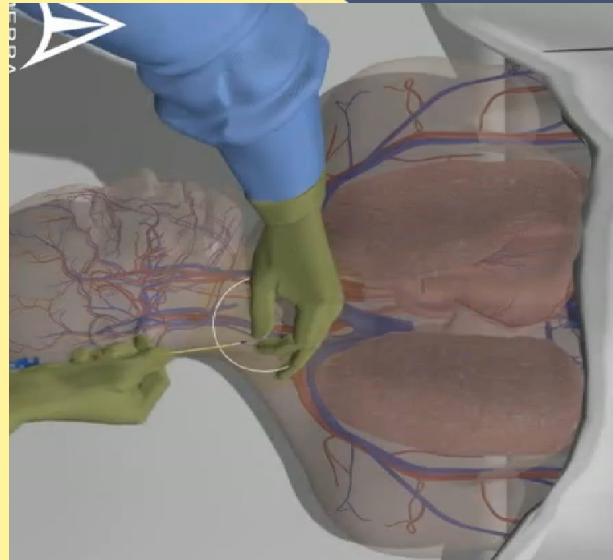
2. Insert needle into IJV and aspirate



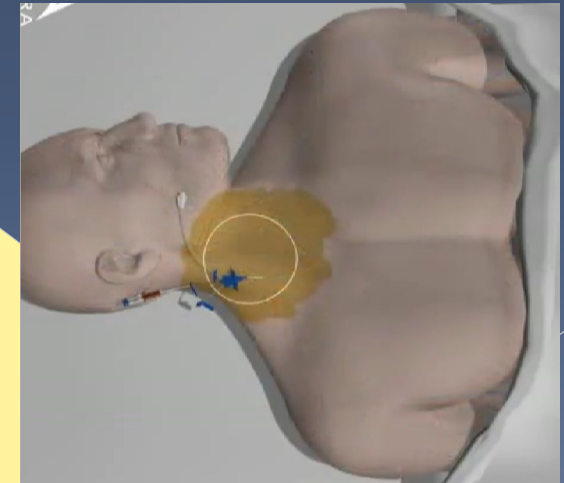
3. Hold tip of needle with one hand



4. Place wire through needle and remove needle



5. Insert catheter over wire then remove wire



6. Once catheter is in place, secure and apply dressing

SUBCLAVIAN APPROACH

POSITIONING

- Trendelenburg position (10-15 degrees)
- Supine position, head and shoulders neutral with arm slightly abducted
- Stand beside the patient at the side

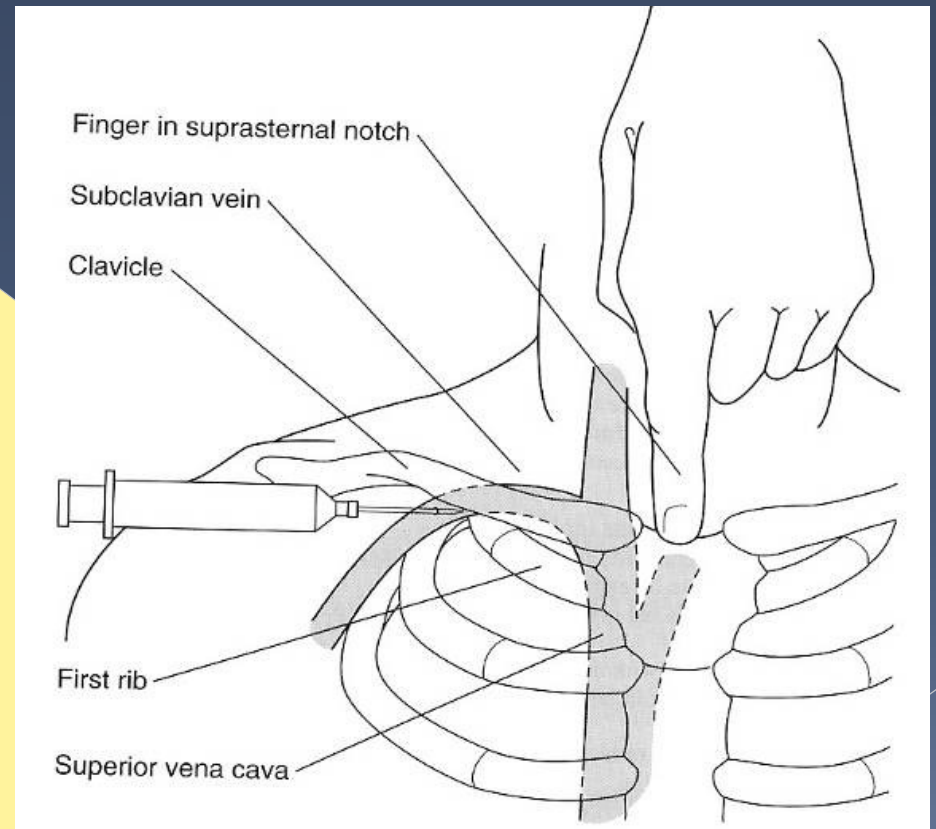
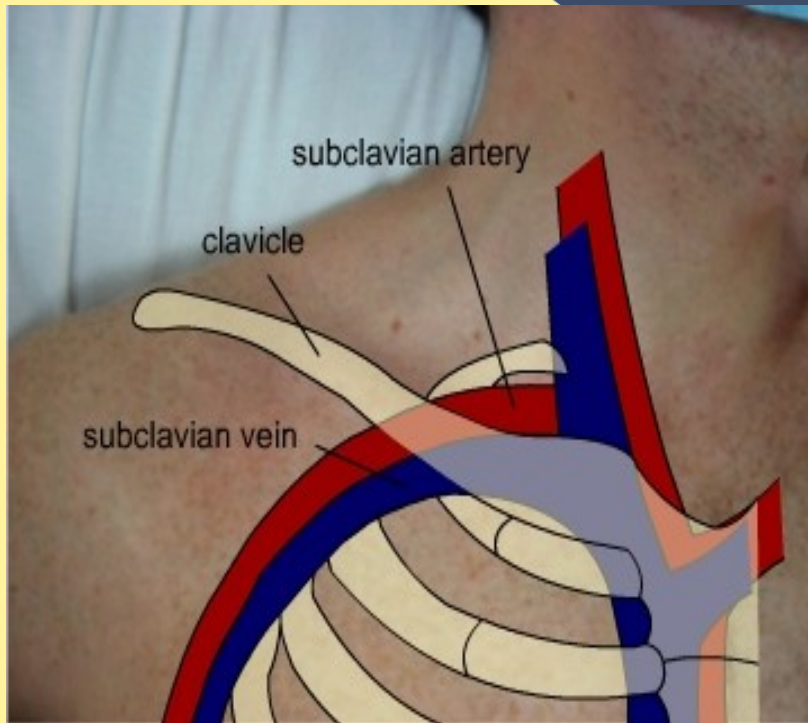
PROCEDURE

- Disinfect area and apply local anaesthetic
- Cover procedure area with fenestrated sterile drape
- Use seldinger technique

LOCATION AND ACCESS TO VEIN

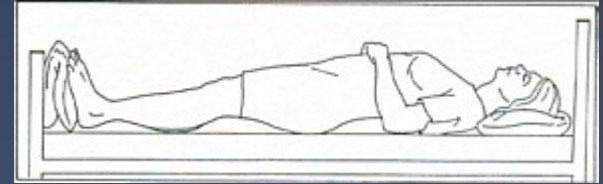
- Identify the midclavicular point and sternal notch
- Insert needle into the skin 1cm below and lateral to the midclavicular point
- Direction of needle should be parallel to skin
- Advance posterior to the clavicle aiming for the sternal notch (Do not pass the needle further than the sternal head of the clavicle)

Location and insertion of needle



<http://video.google.com/videoplay?docid=2421324986948418582#>

FEMORAL VEIN APPROACH



POSITIONING

- Supine patient
- Extend the patient's leg and abduct slightly at the hip

PROCEDURE

- Disinfect area and apply local anaesthetic
- Cover procedure area with fenestrated sterile drape
- Use seldinger technique

LOCALISATION AND ACCESS TO VEIN

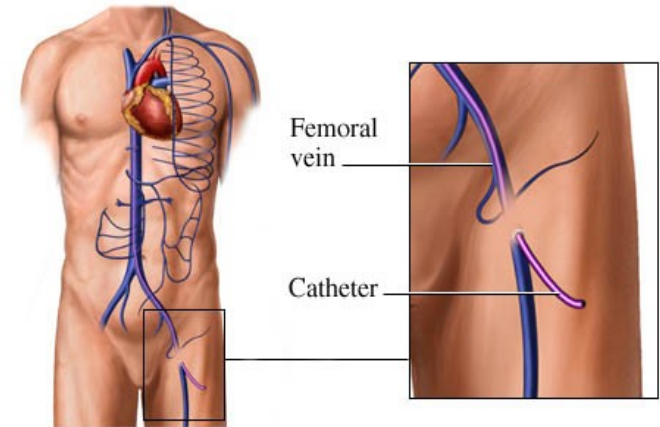
- Vein is medial to femoral artery
- Identify the pulsation of the femoral artery 1-2 cm below the inguinal ligament.
- Position needle at 45 degree angle and about 1cm medial to pulsation
- Needle inserted at skin about 2 cm below inguinal ligament
- Aiming towards the umbilicus

(In adults, the vein normally found 2-4cm from the skin. In small children reduce elevation on the needle to 10-15° as the vein is more superficial)



uOttawa

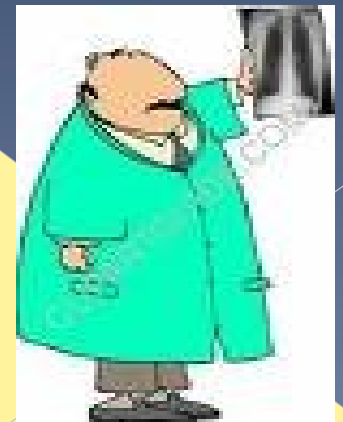
General anatomy of the right femoral vein



http://www.4shared.com/file/61538831/b1027127/Placement_of_a_Femoral_Venous_.html

POST CATHETER PLACEMENT

- 1) Aspirate blood from each port
- 2) Flush with saline / sterile water
- 3) Secure the catheter with sutures
- 4) Apply sterile dressing
- 5) Dispose of used gloves, needles, syringe etc
- 6) Wash hands
- 7) Chest x-ray for IJ and SC lines



EVALUATION

| LOCATION | BENEFITS | RISKS |
|-----------------------|--|---|
| INTERNAL JUGULAR VEIN | <ul style="list-style-type: none">•Bleeding can be seen and controlled•Decreased risk of pneumothorax | <ul style="list-style-type: none">•Risk of Carotid artery puncture•Pneumothorax |
| SUBCLAVIAN VEIN | <ul style="list-style-type: none">•Most comfortable for conscious patients | <ul style="list-style-type: none">•Increased risk of pneumothorax•Should not be done on less than 2yrs•Vein is non-compressible |
| FEMORAL VEIN | <ul style="list-style-type: none">•Easy to locate•Less bad complications•No risk of pneumothorax•Preffered in emergencies | <ul style="list-style-type: none">•Highest risk of infection•Risk of DVT |

THANK FOR LISTENING!

