Preventing Peripheral IV Catheter Associated Infections

Dr. Sanoop Kumar Sherin Sabu., M.D.(Int Med), FCPM

Consultant Physician

www.yourfamilydoctor.co.in

skssabu@gmail.com

IV Catheter Risks

- Preventing IV Catheter Associated Infections Intravascular (IV) catheters are used a lot in healthcare.
- However they are associated with the risk of bloodstream infections (BSIs).
- Bloodstream Infections (BSIs) are caused by microorganisms that colonize the:
  - External surface of the IV device
  - Fluid pathway when the device is inserted
  - Fluid pathway when the device is handled after insertion
- These serious infections are associated with increased morbidity, mortality and healthcare cost

BSIs are largely preventable when evidence based practices are followed for insertion and maintenance of intravascular devices

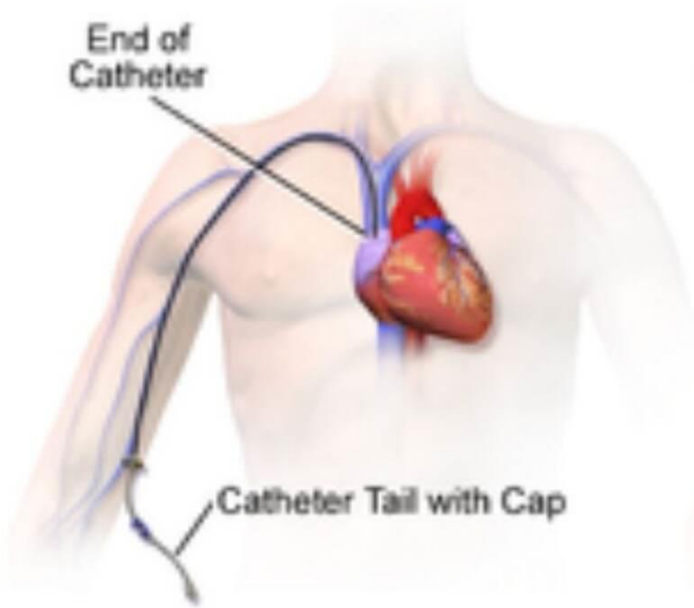
Types of IV catheters: 2

- Central Line (CL) or Central Venous Catheter (CVC)
- Peripheral Intravenous Line (PIV)

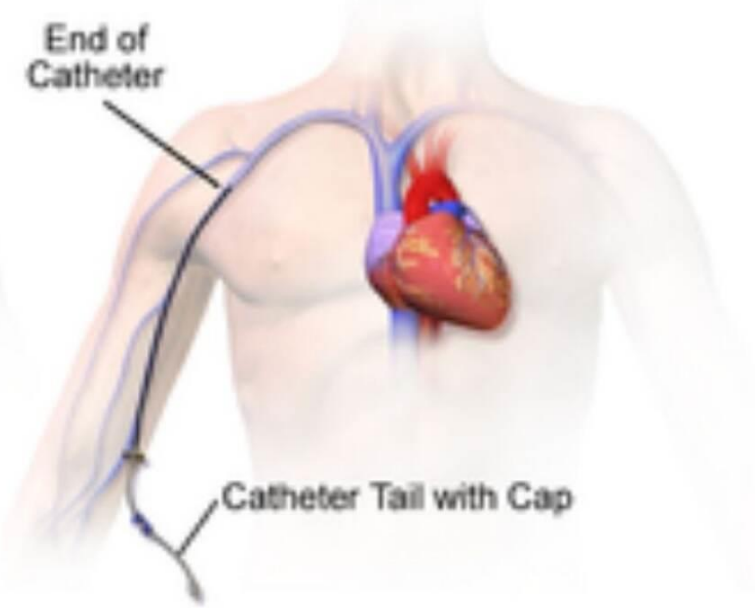
Central Line (CL) or Central Venous Catheter (CVC)

- Is inserted in the neck, chest, groin or arm areas
- Terminates at or close to the heart or in one of the great vessels
- Is used for infusion, withdrawal of blood or hemodynamic monitoring
- Available in various types, like
  - PICCs
  - implanted ports
  - tunneled catheters
  - dialysis catheters
  - percutaneously placed catheters (internal jugular, femoral).

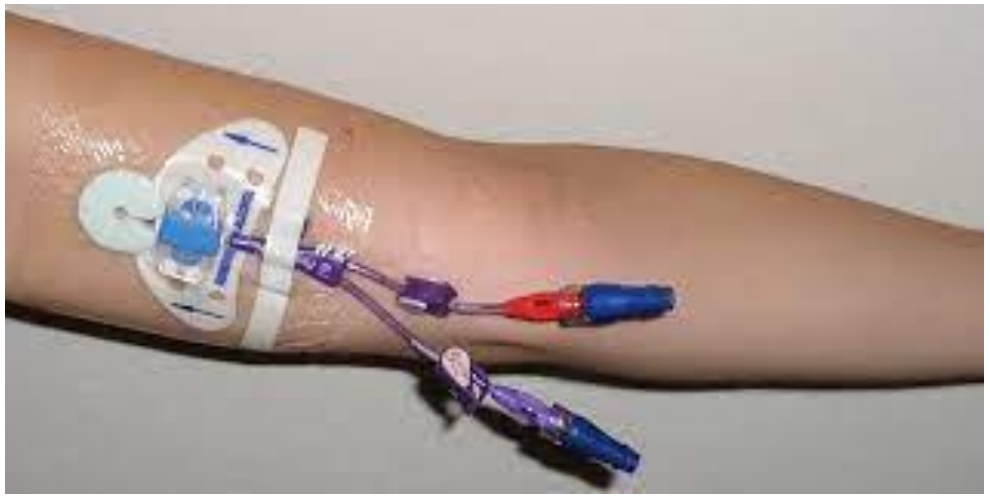
Peripherally Inserted Central Catheters (PICCs)



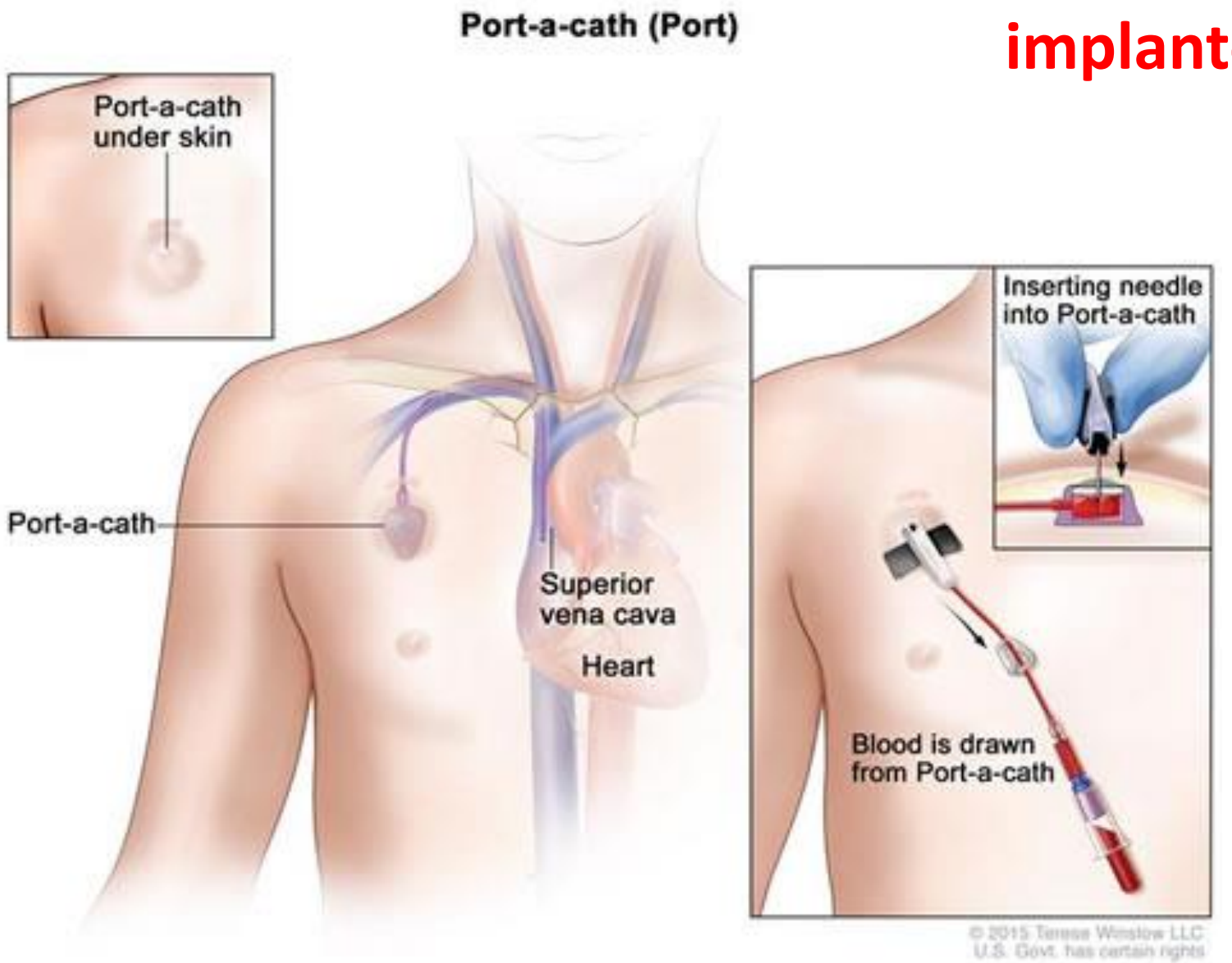
PICC Catheter



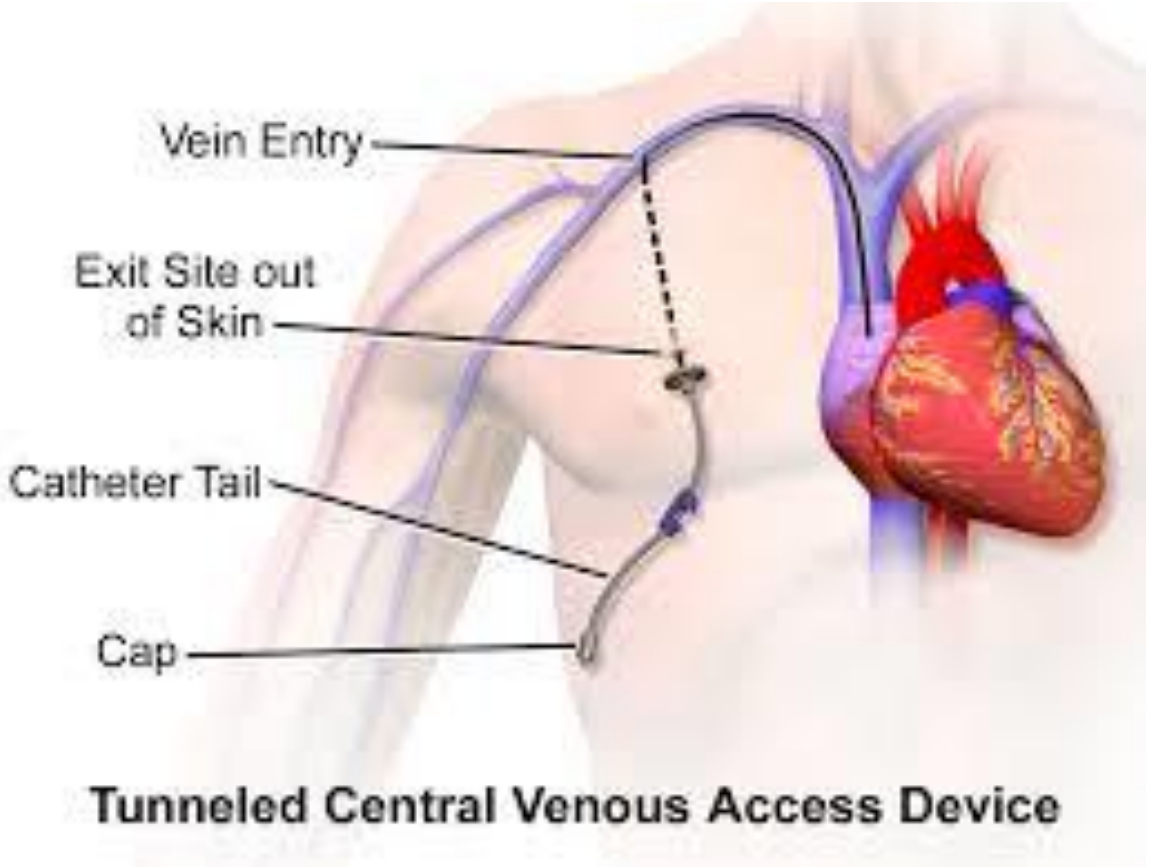
Midline Catheter

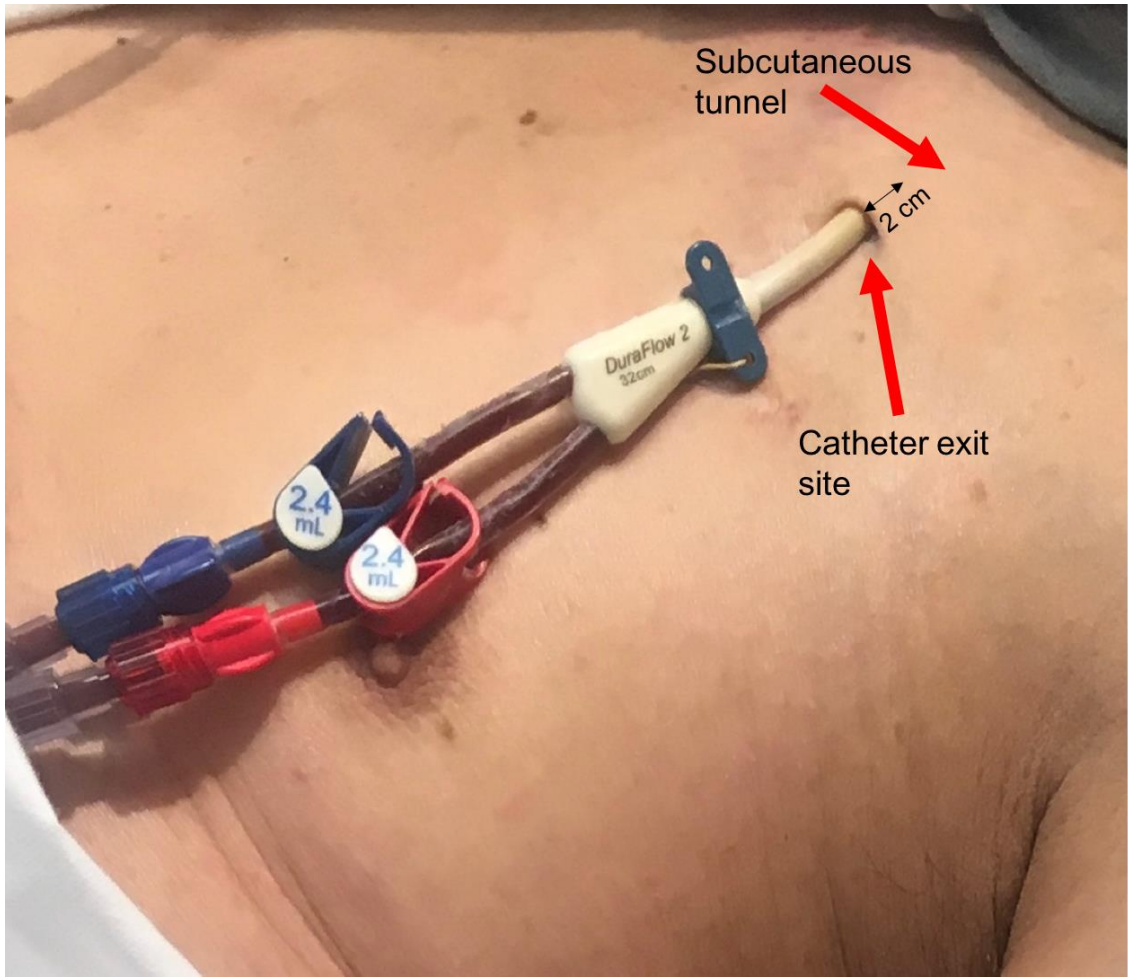


implanted ports



tunneled catheters





Percutaneously placed catheters (internal jugular, femoral)

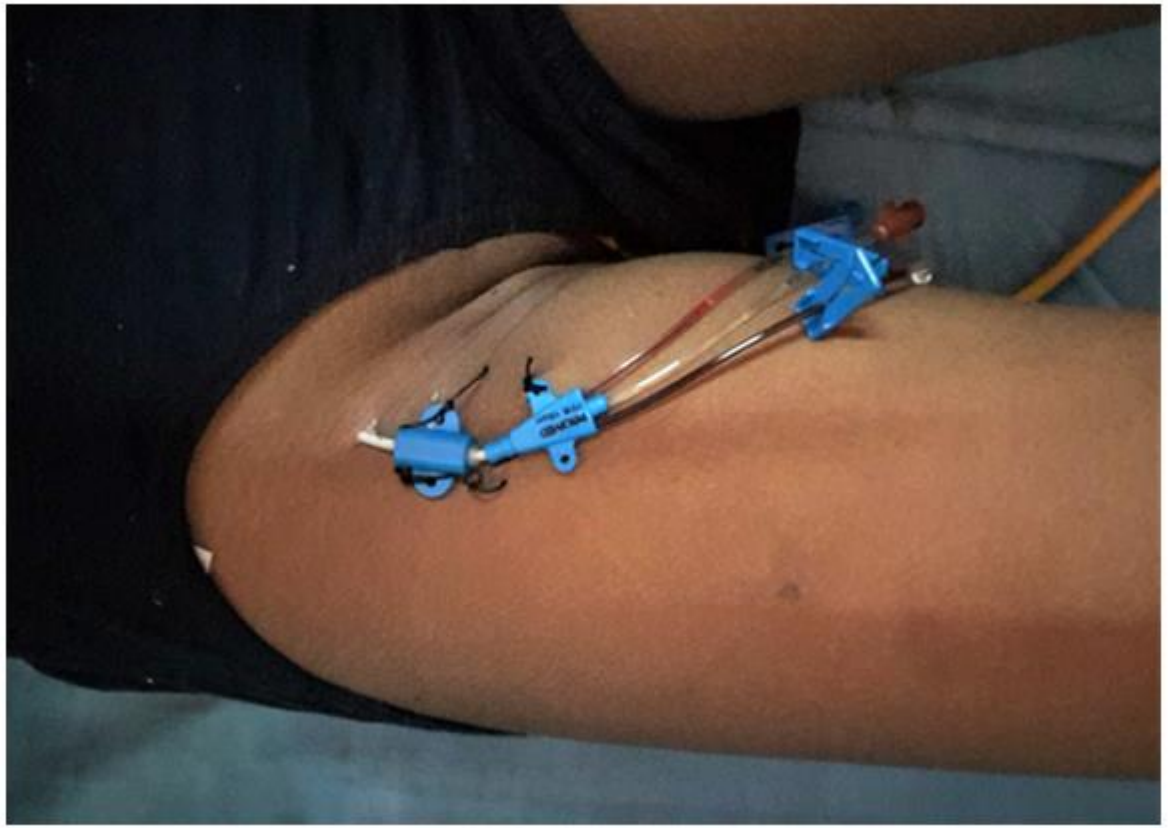


Figure 3: Catheter (blue) placed in Femoral artery

Peripheral Intravenous Line (PIV)

- Is inserted into a patient's peripheral vein
- Is short and terminates only an inch or so from the insertion point
- Is used for administering medication, fluids and/or blood products

How Peripheral/Central Line Associated Infections Occur ?

1. Contaminated hands of the medical professional
2. Contamination of the catheter during insertion or handling
3. Inadequate disinfection of catheter hubs, ports or needleless connectors before accessing the line
4. Skin organisms from the patient that travel through the insertion site
5. Contaminated IV fluids (rare)

What is CLABSI ?

Central Line Associated Bloodstream Infection.

- It is a CDC/NHSN surveillance term
- It is defined as primary bloodstream infection (BSI) that is not secondary to an infection at another site and develops in a patient with a central line in place for more than 2 calendar days.

Preventing IV Catheter Associated Infections

- **Peripheral IV Catheter (PIV): Prevention Bundles:**

1. When insertinga PIV catheter:

1. **Perform hand hygiene** with an alcohol based hand rub before inserting an IV device or having contact with the IV dressing, site, device or attachments
2. **WearPersonal Protective Equipment (PPE**). PIV insertions require gloves and mask with face shield.
3. **Select an optimal Insertion site**. In an adult, the preferred PIV site is the dorsum of the hand.
4. Prep skin at insertion site with an alcohol/chlorhexidinesolution (70% alcohol, >0.5% chlorhexidine), such as ChloraPrep.

Follow these steps:–

- Perform a 30 second back and forth scrub and then air dry
- Use tincture of iodine, an iodophor, and/or 70% alcohol as alternatives if there is a contraindication to chlorhexidine (i.e., patient sensitivity, device manufacturer recommendations, neonates)

2. Peripheral IV Catheter (PIV): Care/Maintenance Checklist

1. Perform hand hygiene with an alcohol based hand rub before contact with the IV dressing, site, device or attachments
2. Disinfect ports, hubs, needleless connectors and stopcocks before you connect or inject:-
3. Assess the necessity
4. Donot routinely rotate PIV sites
5. Apply transparent dressings
6. Maintain a closed sterile system

2. Disinfect ports, hubs, needleless connectors and stopcocks before you connect or inject

- Scrub vigorously with alcohol/chlorhexidine solution or alcohol (recommended scrub time is 15 seconds or more) and let dry.
- **Clean visible blood from all ports, tubing, stopcocks and connections.**

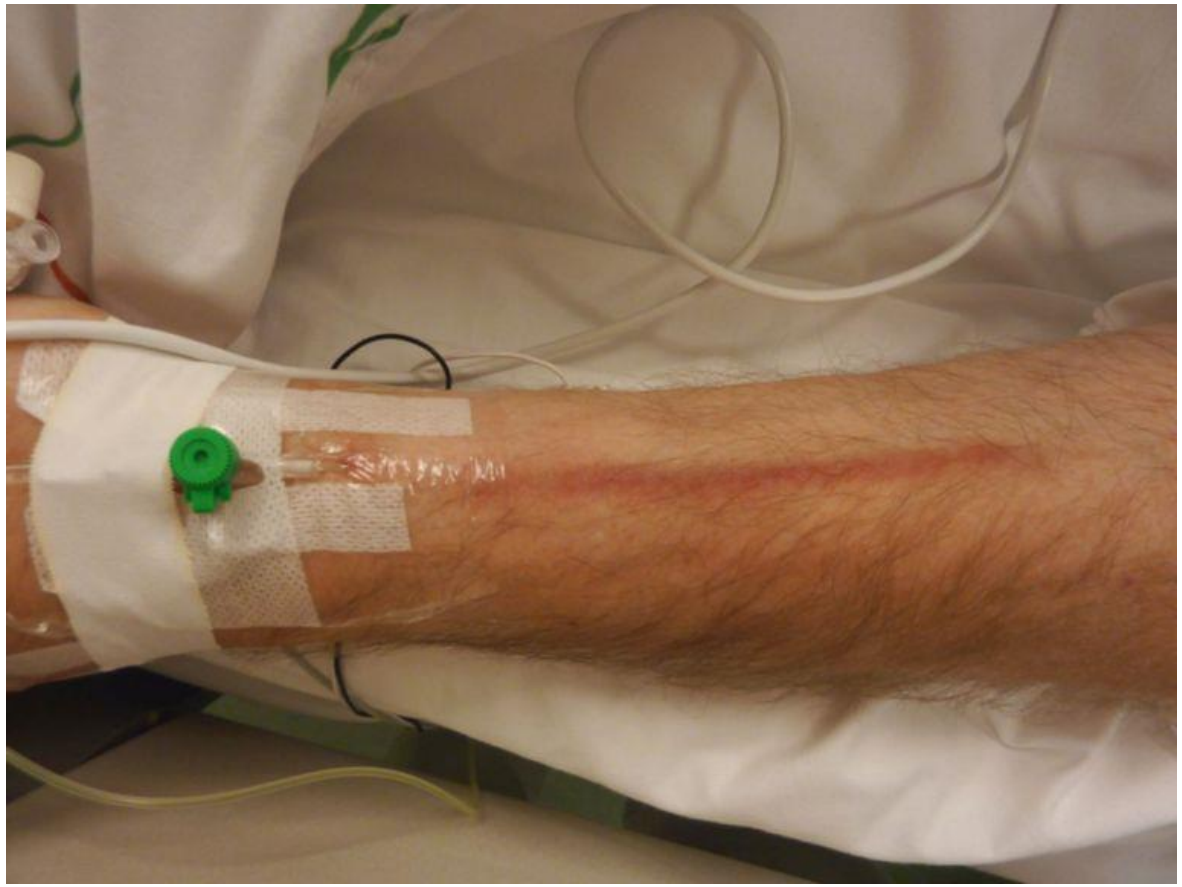
3. Assess the necessity

- Assess the necessity of PIV lines on a daily basis

If you determine that the IV is no longer necessary, contact the physician for a removal order.

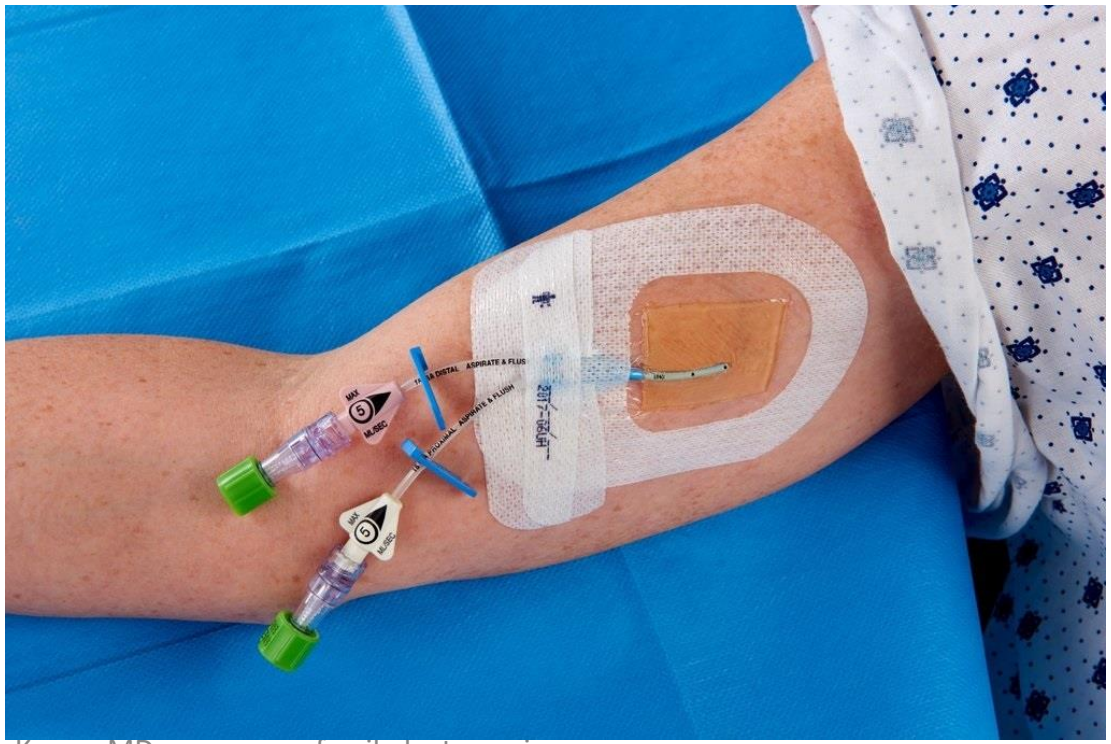
4. Donot routinely rotate PIV sites

- Unless clinically indicated do not rotate
- Replace the PIV immediately if the site is
  - no longer functional
  - signs of infiltration/ extravasation
  - Phlebitis
  - purulence
  - other signs of infection- warmth, redness, raised temperature



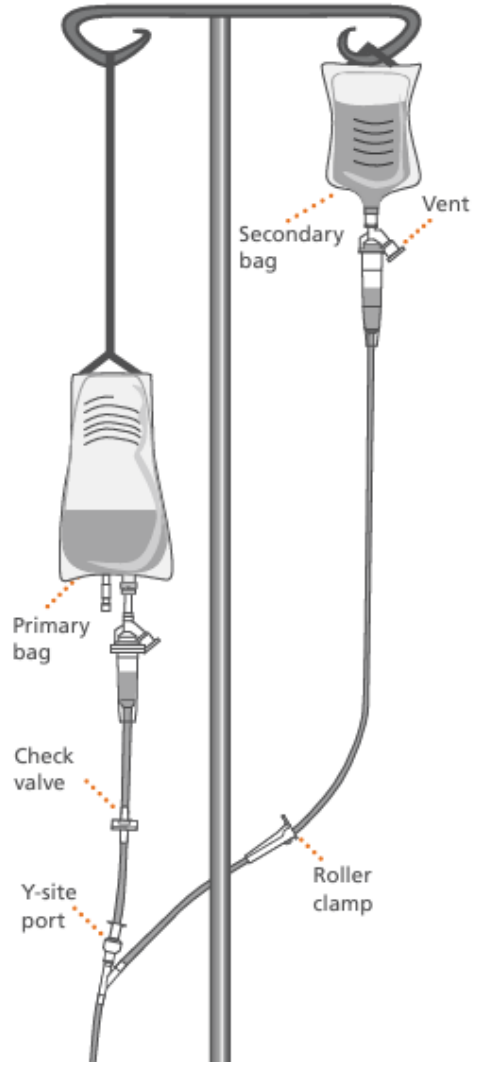
5. Apply transparent dressings

- Leave dressings until catheter is removed unless they become damp, wet, loose or soiled



6. Maintain a closed sterile system

- Use sterile end caps
- Donot “loop” IV tubing back into the hub when disconnected for intermittent infusions
- Avoid breaks in the closed tubing system whenever possible
- Back prime compatible infusates for intermittent infusions



7. Palpate, visually assess and document

- What to look for?- Look for signs of infection or malfunction
  - Assess patient for complaints of pain at the site
  - **redness, warmth, swelling, tenderness**
  - oozing of fluid or blood
  - skin discoloration, red streaks
  - palpable cord or pus or infiltration
- How often?-
  - **at least every two hours with continuous infusions,**
  - **or at least twice in a 24 hour period when IV site is "locked" for intermittent infusions, and as needed.**
- **What to do?-**
  - **Discontinue the IV immediately if these signs appear**
  - **Rotate the site immediately if needed**

8. Closely follow hang times

- Do not hang IV fluids mixed by Pharmacy or Nursing longer than 24 hours, unless other wise indicated. This includes parenteral nutrition.
- Do not hang premixed fluids for adults longer than 96 hours
- Lipid emulsions- 12 hours
- All blood components (excluding factor VIII or IX for continuous infusion)

9. Change tubing

- for adults every 96 hours for continuous infusions or
- every 24 hours for intermittent infusions
- For blood and blood components single use
- Change tubing that is contaminated or damaged immediately
- Change the needleless connectors or caps along with the tubing and as needed – when blood stained or mud or dust

Some more point to Rember on PIVC

- Hair at the insertion site should only be removed by the clinician (prior to antiseptic application), **using clippers** (not shaved) to improve adherence of the dressing.
- Using a short extension set attached to the catheter can reduce complications associated with catheter movement

- The catheter should be stabilised with a transparent dressing (best) and sterile adhesive tape or sterile adhesive/wound closure strips, to prevent catheter dislodgement

Should not use/do

- **Use adhesive tape directly on the insertion site**
- **apply non-sterile adhesive tape under the transparent dressing**
- **obscure the ability to visualise the PIVC site and surrounding tissues with adhesive tape.**
- Topical venodilators (e.g. glyceryl trinitrate) or anti-inflammatory agents (e.g. cortisone) near the insertion site
- Shaving set

- A catheter that has migrated externally should not be readvanced by the clinician prior to restabilisation

Catheter duration and replacement??

- **Depends on local protocols**
- **PIVCs should be removed as soon as they are no longer required**

Option 1

- Some studies have indicated that the incidence of thrombophlebitis and bacterial colonization increases when catheters are left in place >72 hours,(1, 19) and that the incidence of phlebitis is highest when catheters are left in place >96 hours.
- **PIVCs should be removed by the clinician at the first sign of phlebitis (warmth, tenderness, erythema, palpable venous cord)**
- If it can be forecast that a PIVC would be in situ for more than 96 hours, an alternative device should be considered such as a peripherally inserted central catheter (PICC) or Central Line

Option 2- Remove If clinically indicated

- Clinicians should remove PIVCs at the first sign of phlebitis, as well as when no longer required
- Catheters inserted in emergency situations, when adherence to asepsis cannot be ensured, should be replaced by a clinician within 24 hours or sooner if the patient's condition is stabilised.

In extenuating circumstances a cannula may be left in situ after 96 hours if the all of the following criteria are fulfilled

- the patient has very poor peripheral access
- no one else can cannulate the patient
- the patient still requires peripheral access
- the cannula is patent
- there is no sign of phlebitis or infection.

What to do if u suspect IV line related infection

- Change the site ASAP
- meticulously cleanse the skin using alcoholic chlorhexidine(53) or ≥70% alcohol.
- Send for a blood culture from a different peripheral line - Approximately 20 mL is required and 10 mL should be placed in each of the anaerobic and aerobic blood culture bottles.
- Culture of PIVC tips may be useful in confirming the source of line related bacteraemia when performed concurrently with peripheral blood cultures

Together We Prevent Nosocomial Infection

- **Dr. Sanoop Kumar Sherin Sabu., M.D.(Int Med), FCPM**
- **Consultant Physician**
- **www.yourfamilydoctor.co.in**
- **skssabu@gmail.com**

Topic Not covered in this slides??

1. **Central Line care**