PERIPHERALLY INSERTED CENTRAL CATHETERS (PICC)

CARE AND MAINTANENCE

Fong So Kwan

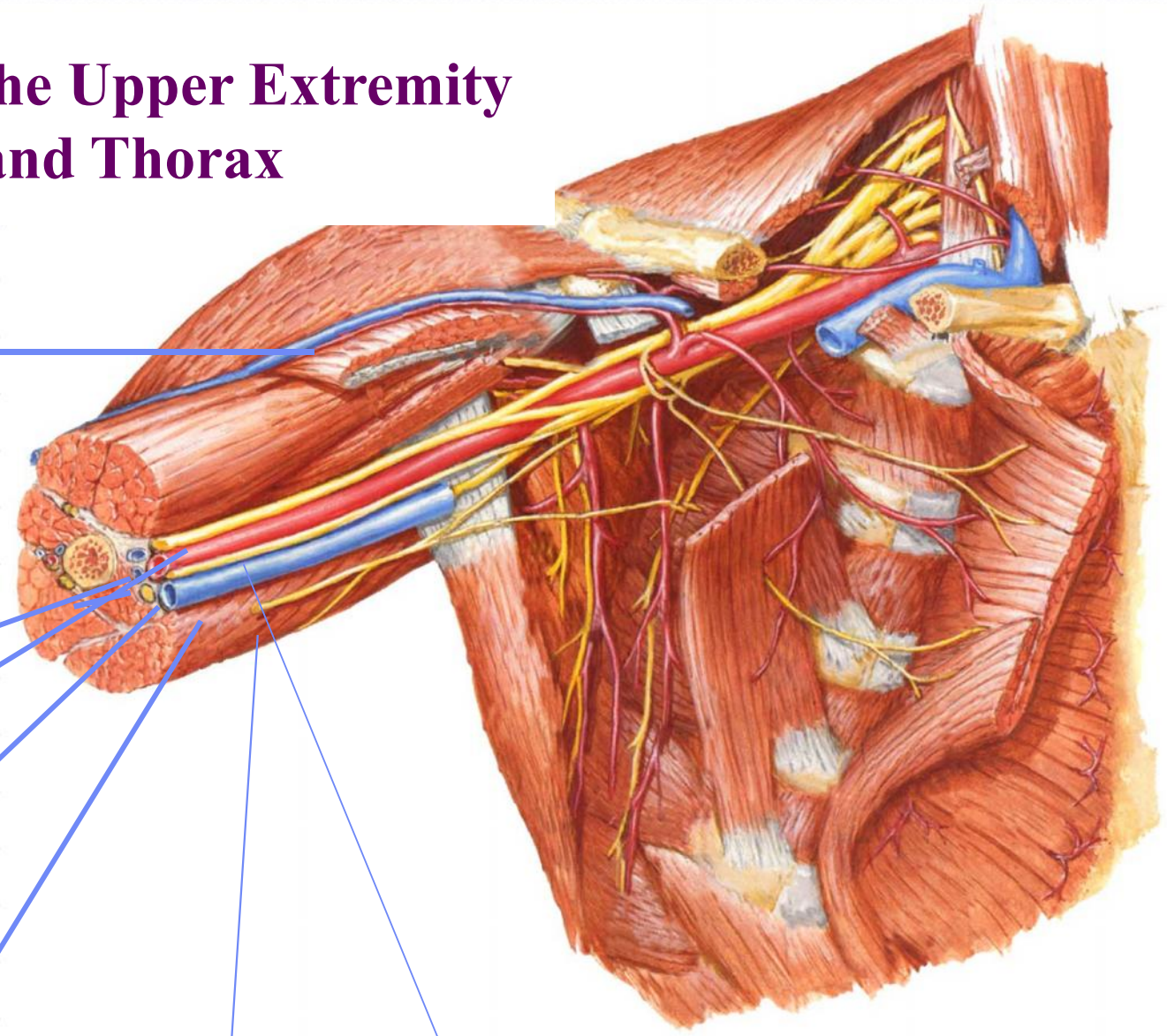
APN, Haematology unit

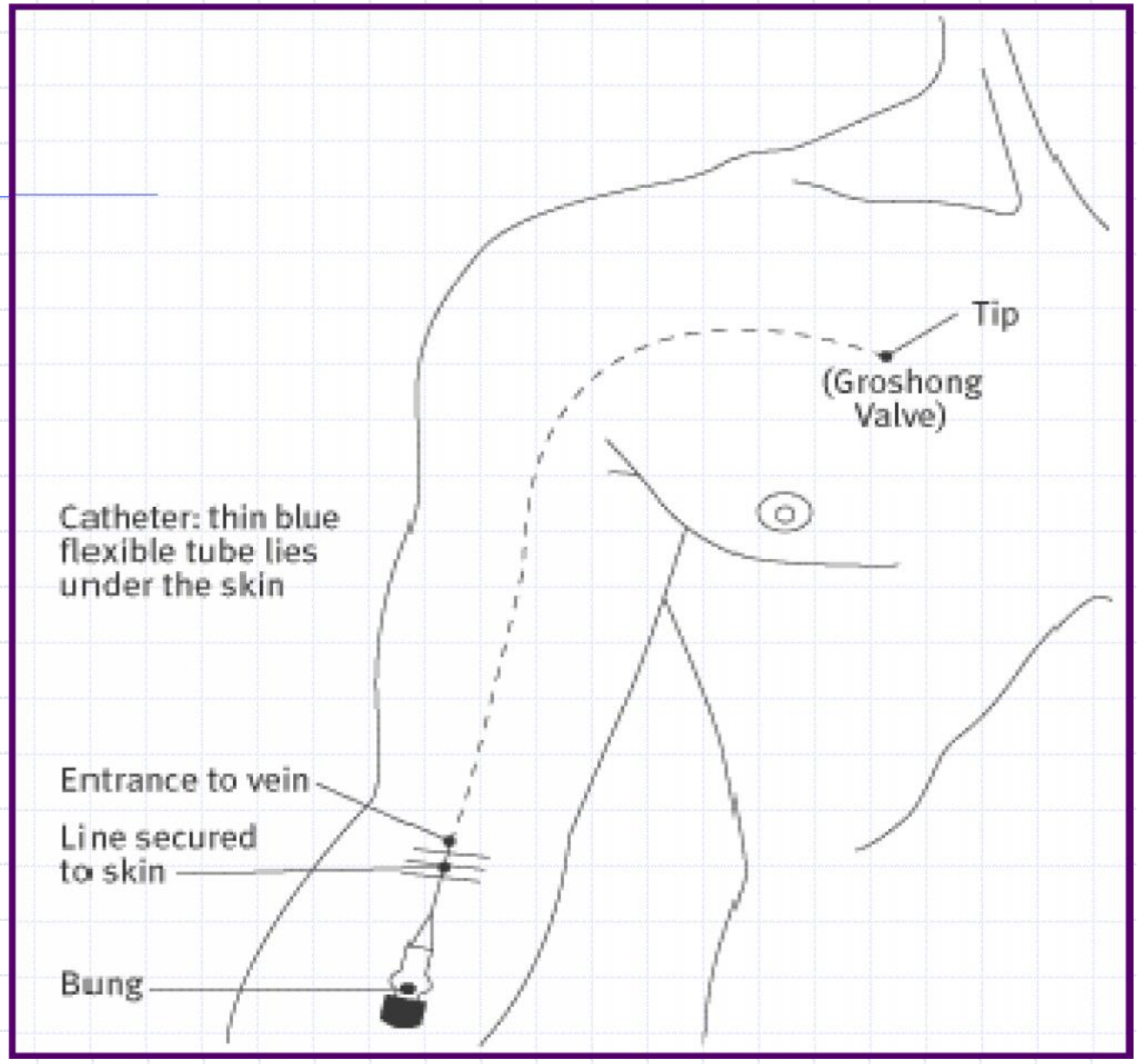
Medical Department, QMH

What is a PICC catheter?

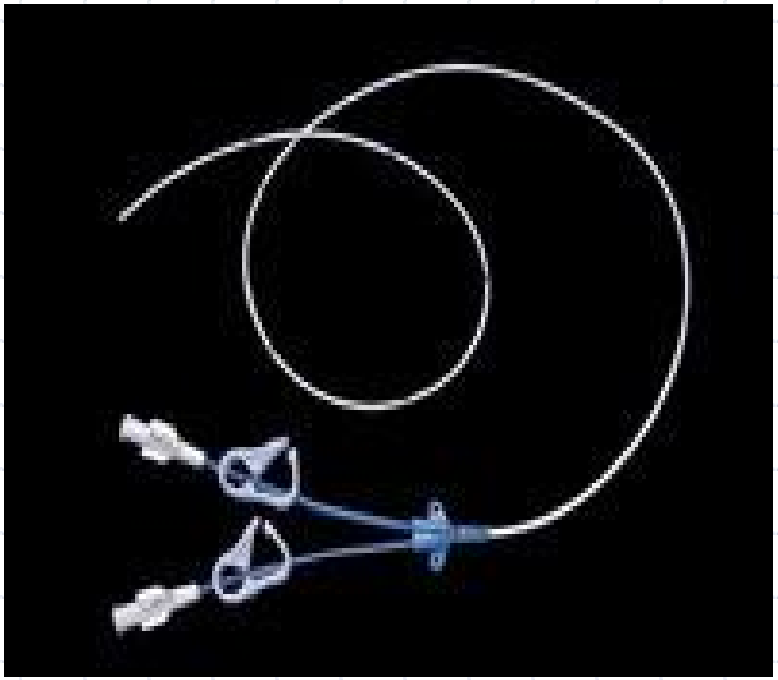
- Primary vascular access device since their introduction in the mid-1970s,
- Placed via a peripheral vein, such as basilic vein of the anterior forearm, the open-ended catheter tip lying in the superior vena cava.
- Catheter introduction technique with fluoroscopy and ultrasound guidance.
- Safer and economics to alternative types of catheters
- Use for drawing blood and for giving iv fluids, blood products, medication, chemotherapy, or nutrition.

Veins of the Upper Extremity and Thorax

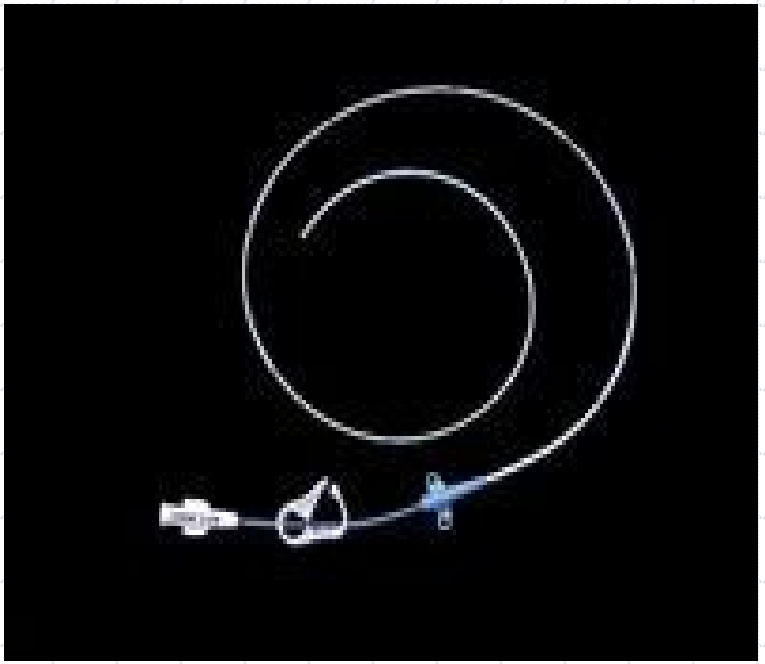



Tip
(Groshong Valve)
Catheter: thin blue flexible tube lies under the skin
Entrance to vein
Line secured to skin
Bung

Types of PICC



Dual Lumen
with Clamps

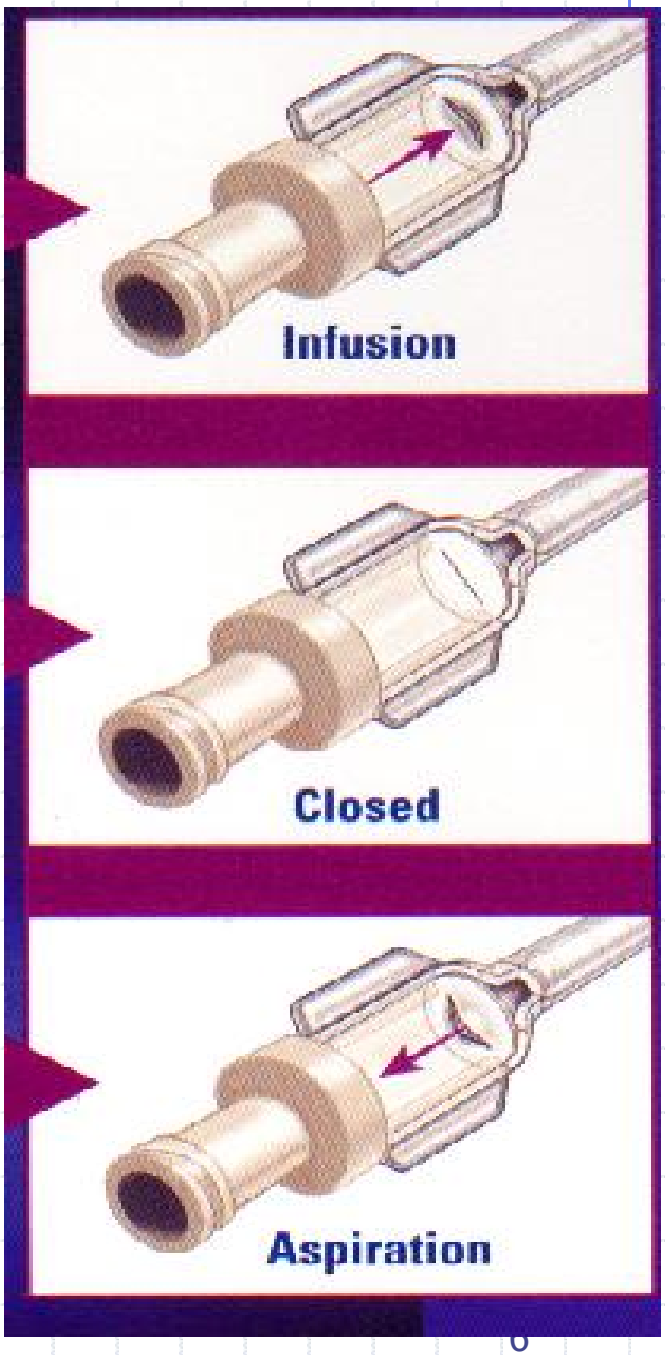


Single Lumen
with Clamp

PASV™ Technology

P ressure
A ctivated
S afety
V alve

- **Proximal three-way valve remains closed**
  - **acts as a clamp, except during infusion and aspiration**



Complications

- Phlebitis
- Thrombophlebitis
- Thrombosis
- Migration
- Malposition
- Fibrin sheath
- Infiltration
- Rupture
- Breakage
- Leaking
- Vessel thrombus
- Occlusion
  - Blood
  - Chemical
  - Mechanic
- Air Embolism

Observations

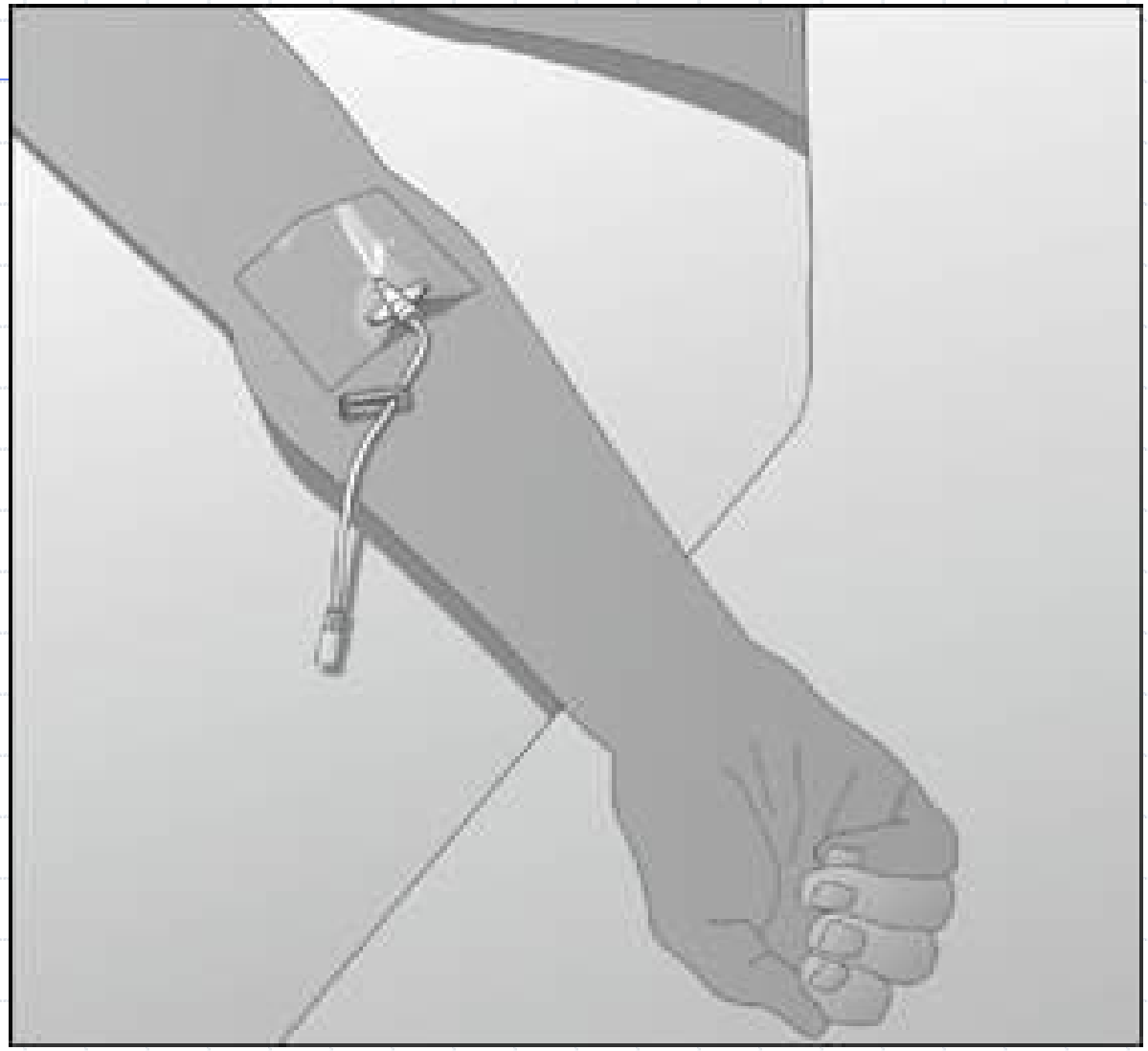
- Watch for:
  - Fever or chills (a temperature over 37.5℃)
  - Redness, bleeding, or swelling
  - Leakage from the catheter
  - Change in length of catheter visible on your arm
  - Bleeding
  - Swelling of the arm, shoulder, or neck
- Feel for:
  - Pain
  - Heat
  - Tenderness in the arm, jaw, neck, or ears

Care and maintenance

Cleaning
Dressing
Patency

Cleaning the device

- Acetone – cause damage!
- Alcohol
  - Not on polyurethane
  - Do not prolong rubbing
  - causes crazing leading to brittleness and increased potential for cracking
- Povidone-iodine lotion
  - Solution – let it dry
  - May damage some silicone
- Clean the exit site twice weekly, and daily if infection occur



Dressing the device

- Removing the dressing
  - Lift edges and always work toward center (point of entry)
  - Your goal: prevent catheter migration or dislodged
- Verify base-line length of exposed catheter
- Monitor insertion site for drainage and redness
- NEVER use scissors or clamps on or near the catheter

Dressing the device

- Never push the catheter back into the skin if it is accidentally pulled out any distance.
- If malpositioned catheter is detected(>2cm), check for blood return and get chest x-ray
- Make sure there are no kinks in catheter or tubing
- Dressing material
  - Gauze & tape
    - not on PICC's
  - Transparent semi-permeable membrane (TSM)

Dressing the device

End cap

- Apply a sterile end cap on the hub
- Change weekly or soiled with strict aseptic technique using Povodine-iodine lotion
- PosiFlow
  - positive pressure cap
  - needleless multi-injection port
  - Can be swabbed by Alcohol wipes
- Protect from wet during shower by plastic wrap e.g. Tegaderm

Flushing

- Confirm free aspiration of venous blood after catheter placement and prior to use
- Catheter should be flushed after every use and at least weekly using 10ml or larger syringe
- Positive pressure Heparin lock should re-established after every use
- Lumen should be flushed with twice the indicated lumen volume using NS and then heparinised saline10units/ml to 100 units/ml (using push-pause technique)
- Flush weekly if not in use

Drawing Blood(1)

- Use large lumen
- Not suitable if used for TPN administration
- Flush the catheter with NS prior withdrawal
- Discard 5ml blood before obtaining the blood sample
- Smaller syringe or vacutainer is not suitable as it may causes the catheter to collapse

Drawing Blood(2)

- If any difficulty in aspiration, instruct patient to
  - Reposition the arms by flexion, extension and elevation above the level of the head
  - Attempt to flush and aspirate the catheter again
- Flush the catheter with NS and then heparinised saline10units/ml to 100 units/ml (using push-pause technique) after drawing blood

Patency

- Ensure there is no kinked tubing
- Do not let intravenous fluids run dry
- Make sure no incompatible drug delivery
  - Can try with hydrochloric acid or ammonium chloride
- Do not measure the patient's BP on the catheterized arm
- Positive pressure technique - PosiFlow
- Following blood draw- 20 cc's

Declotting obstructed catheters

- Verify there is no kinked tubing
- Reposition the patient and let cough
- Flush the catheter vigorously with NS if there is no resistant. Use a 10ml or larger syringe
- No excessive force to an obstructed lumen

Problems (1)

- A small red bump
  - Normal after insertion
- Infection
  - Fever, chills, sweating & flu-like signs
  - Local signs of swelling, tenderness or fluid leaking
- Breakage or Leaking from the catheter
  - First fold the catheter above the break then secure the catheter. Repair kit is not available
- "Stopped-up" catheter
  - Do not attempt to force fluid into the catheter if unable to push fluid in.

Problems (2)

- Swelling of the Arm, Shoulder or neck
  - Suspicious of vessels thrombus
- Pain
  - Abnormal when occur along the catheter or when receiving fluids via catheter
- Air in the bloodstream
  - If the catheter is broken, torn or any tubing connections are open
  - Signs – SOB and chest pain
- Bleeding
  - Apply pressure and correct clotting profile

WARNING

- Do not exceed 40psi on infusion pumps when administering fluids
- PICC are not designed for power injection of contrast medium as Catheter rupture may occur.

THANK YOU