Lost In Space: Lines and Tubes in the Wrong Places

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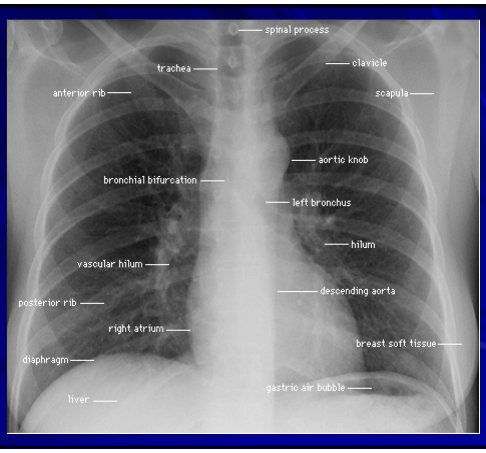
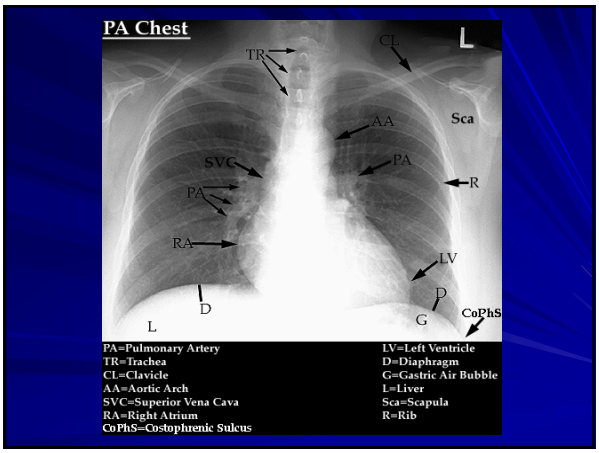
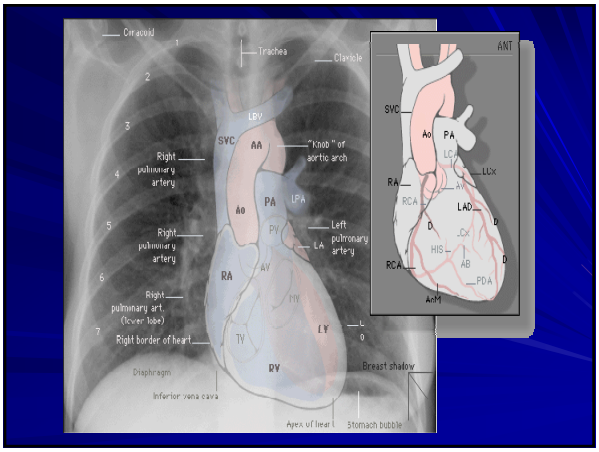
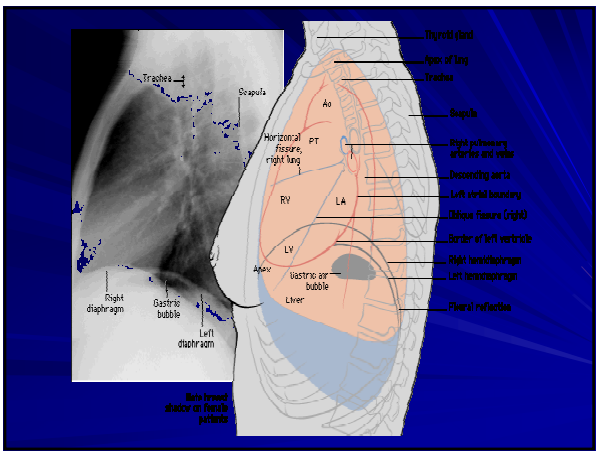
Objectives:

- Review normal position of central venous catheters
- Review normal position of pulmonary artery catheters
- Review normal position of endotracheal tubes
- Review normal position of nasogastric and feeding tubes

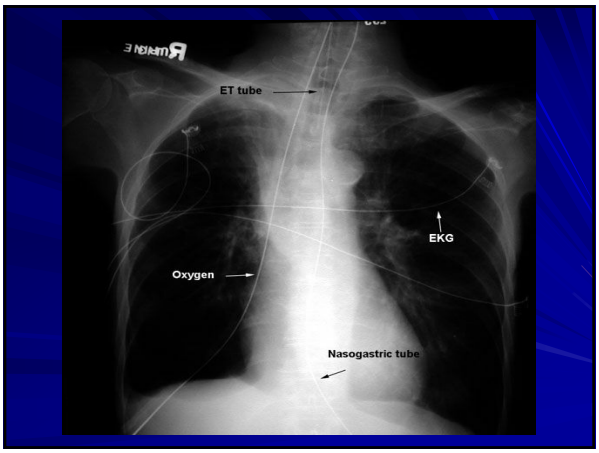



PA Chest
TR
CL
L
AA
Sca
SVC
PA
R
PA
RA
LV
D
D
G
L
CoPhS
PA=Pulmonary Artery
TR=Trachea
CL=Clavicle
AA=Aortic Arch
SVC=Superior Vena Cava
RA=Right Atrium
CoPhS=Costophrenic Sulcus
LV=Left Ventricle
D=Diaphragm
G=Gastric Air Bubble
L=Liver
Sca=Scapula
R=Rib

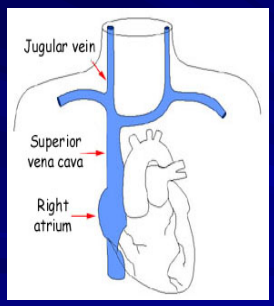

Trachea
Clavicle
ANT
SVC
AA
"knob" of aortic arch
Right pulmonary artery
Ao
PA
LPA
Left pulmonary artery
RA
AV
RV
LV
Right border of heart
Diaphragm
Inferior vena cava
Breast shadow
Apex of heart
Stomach bubble
RCA
LAD
HIS
AB
PDA
AnM


Trachea
Scapula
Ao
Horizontal fissure, right lung
RV
LA
LV
Apex
Gastric bubble
Right diaphragm
Left diaphragm
Liver
Thyroid gland
Apex of lung
Trachea
Scapula
Right pulmonary arteries and veins
Descending aorta
Left atrial bounding
Oblique fissure (right)
Border of left ventricle
Right hemidiaphragm
Left hemidiaphragm
Pleural reflection

- You should systematically evaluate mediastinum, lung fields, pleural space, diaphragm, and chest wall.
- Also evaluate neck, axilla, and abdomen.
- Basically, you can recognize air, water and bone density on chest x-ray.
- Lung fields appear dark because of air. 99% of the lung is air.
- The pulmonary vasculature, interstitium constitute 1% and give the lacy lung pattern.

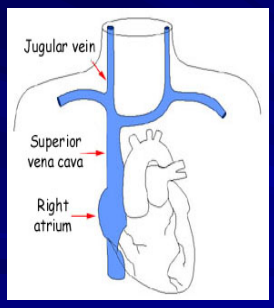


Central Venous Access

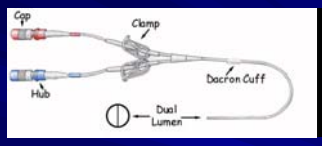


- deliver necessary medications or possibly to draw blood
- Many of the medications that are commonly delivered, for example chemotherapy and some antibiotics, can irritate the lining of the vein. This irritation can cause permanent narrowing or clotting of the vein. For this reason the catheter is placed "centrally", in a large vein, where the medications can be diluted and decrease or eliminate the irritation of the vein lining.

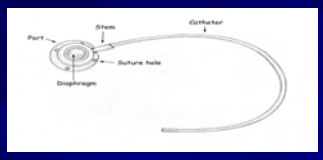
Central Venous Access



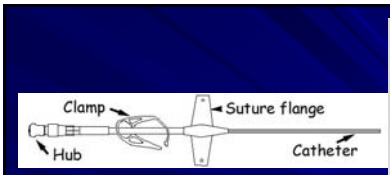
- tunneled and non-tunneled catheters
- Ports
- peripherally inserted central catheters (PICC)



- **Tunneled** catheters have a section that travels under the skin before going into the vein. This section also contains a **cuff**. The cuff is made of Dacron and allows the surrounding tissue to grow in and secure the catheter. Both the cuff and tunnel are used to stabilize the catheter and prevent infection.



- **port** is a chamber made of metal or plastic that is attached to the catheter. Both the port and the catheter are placed beneath the skin. Again, this is done to prevent infection. Some people like the port because it is under the skin and isn't visible. Also routine activities, like swimming, are not limited with a port. But to use the port, a needle must be placed through the skin.



- A **PICC** line is a **P**eripherally **I**nserted **C**entral **C**atheter. Usually placed in an arm vein, its tip is put in the superior vena cava or preferably at the superior vena cava/ right atrial junction. It functions like a tunneled catheter.

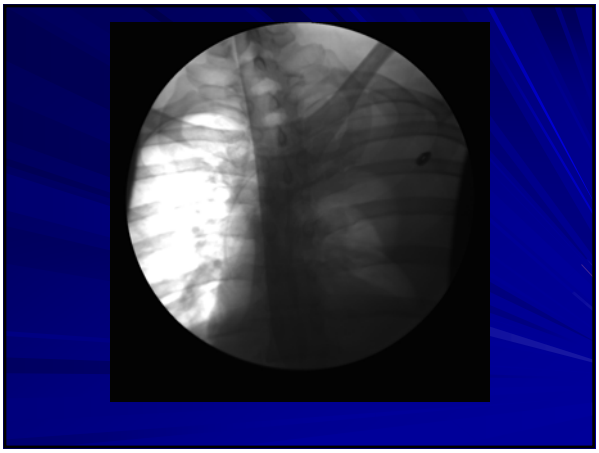
COMPLICATIONS

- **Acute**
- malposition, vessel perforation, arterial puncture/ cannulation, air embolus, pneumothorax, Spasm, bleeding from the subcutaneous tunnel, other
- **Semi-acute**
- malposition, post insertion phlebitis, infection, dehiscence
- **Delayed**
- A. non Function
- extrinsic compression: suture, clamp, kink, pinch off syndrome
- catheter occlusion: precipitate, thrombus (fibrin sheath, luminal thrombus, venous thrombus)
- B. fragmentation
- C. infection

Fluoroscopic image after right internal jugular hemodialysis catheter placement.

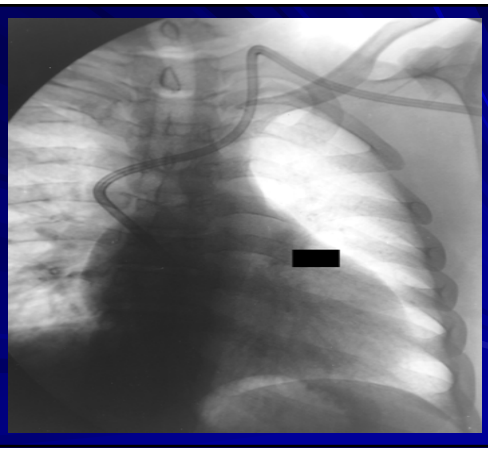
Postplacement right subclavian port radiograph.

Fluoroscopic image after left picc placement.



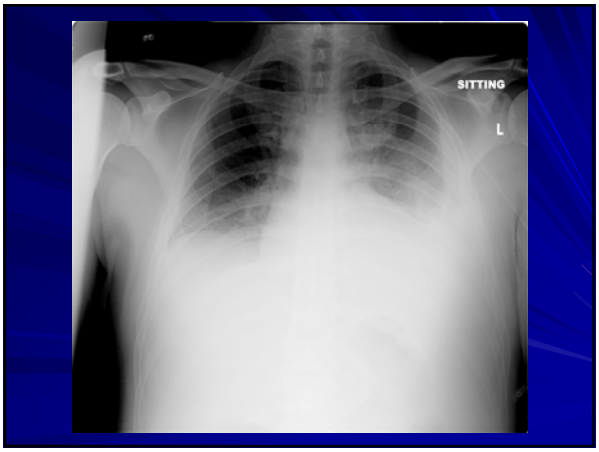
Fluoroscopic image after left hemodialysis subclavian vein catheter placement.

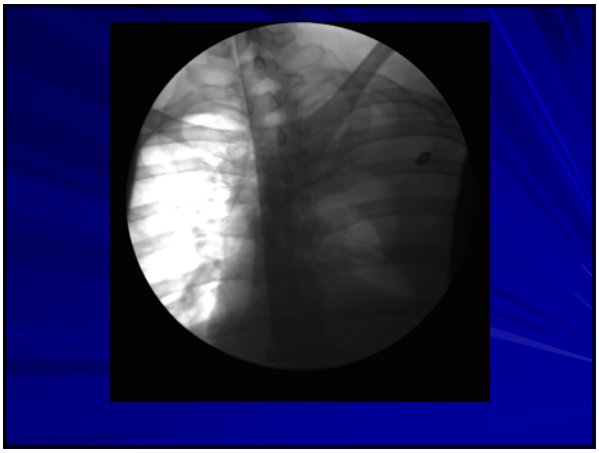
Fluoroscopic image after left hemodialysis internal jugular vein catheter placement.



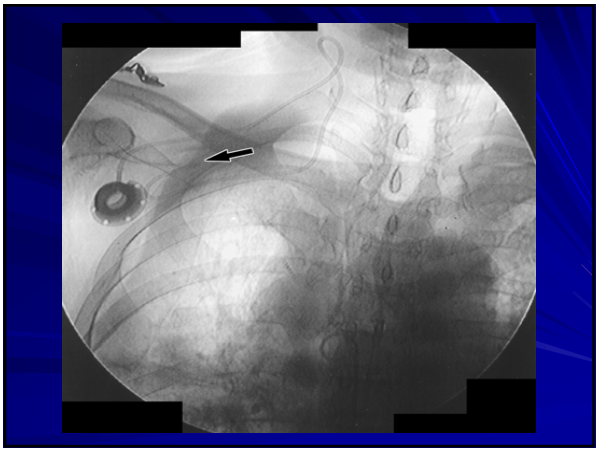
Postplacement PICC line chest radiograph in a patient with metastatic adenocarcinoma.

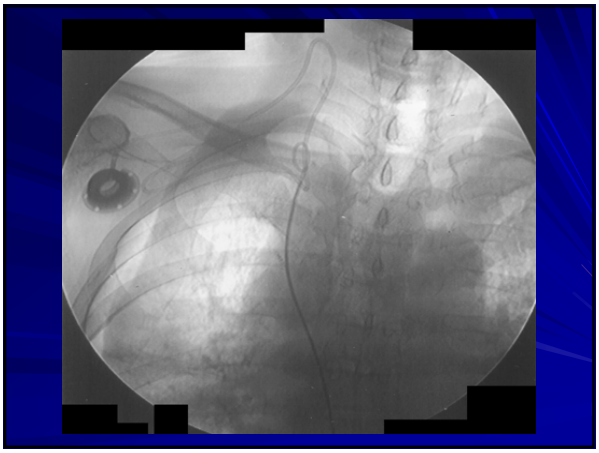

Portable
Semi-Upright


SITTING
L

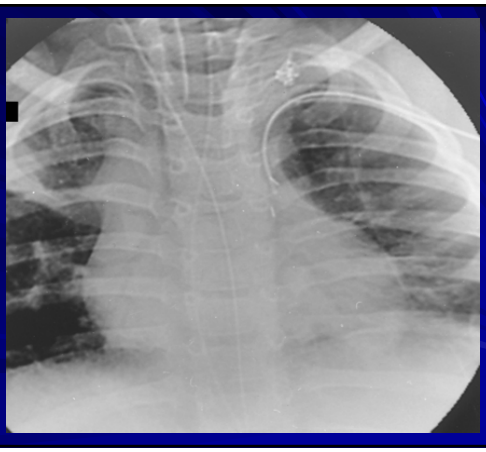


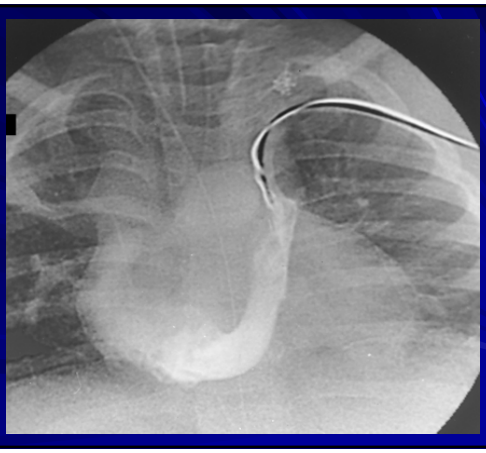
Fluoroscopic image after right internal jugular port placement.





Fluoroscopic image after left PICC placement.





Acute Complications

- **Malposition**
- Vessel Perforation
- Arterial puncture/ cannulation
- Air embolus
- Pneumothorax
- Spasm