Basic Chest X-Ray Interpretation
X-rays - describe radiation which is part of the spectrum which includes visible light, gamma rays and cosmic radiation.

Unlike visible light, radiation passes through stuff.

When you shine a beam of X-Ray at a person and put a film on the other side of them a shadow is produced of the inside of their body.
Different tissues in our body absorb X-rays at different extents:

- Bone - high absorption (white)
- Tissue - somewhere in the middle absorption (grey)
- Air - low absorption (black)
Be systematic

1) Check the quality of the film
• First determine if the film is a PA or AP view.

**PA** - the x-rays penetrate through the back of the patient onto the film

**AP** - the x-rays penetrate through the front of the patient onto the film.

All x-rays in the PICU are portable and are AP view.
Film Quality (cont)

• Was film taken under full inspiration?
  - 10 posterior ribs should be visible.

Why do I say posterior here?

When X-ray beams pass through the anterior chest on to the film Under the patient, the ribs closer to the film (posterior) are most apparent.

A really good film will show anterior ribs too, there should Be 6 to qualify as a good inspiratory film.
• Is the film over or under penetrated if under penetrated you will not be able to see the thoracic vertebrae.
Quality (cont)

• Check for rotation
  – Does the thoracic spine align in the center of the sternum and between the clavicles?
  – Are the clavicles level?
Verify Right and Left sides

- Gastric bubble should be on the left
Now you are ready

- Look at the diaphragm: for tenting free air abnormal elevation
- Margins should be sharp
  (the right hemidiaphragm is usually slightly higher than the left)
Check the Heart

- Size
- Shape
- Silhouette-margins should be sharp
- Diameter (>1/2 thoracic diameter is enlarged heart)

Remember: AP views make heart appear larger than it actually is.
Cardiac Silhouette

1. R Atrium
2. R Ventricle
3. Apex of L Ventricle
4. Superior Vena Cava
5. Inferior Vena Cava
6. Tricuspid Valve
7. Pulmonary Valve
8. Pulmonary Trunk
9. R PA
10. L PA
Check the costophrenic angles

Margins should be sharp
Loss of Sharp Costophrenic Angles
Check the hilar region

- The hilar – the large blood vessels going to and from the lung at the root of each lung where it meets the heart.
- Check for size and shape of aorta, nodes, enlarged vessels
Finally, Check the Lung Fields

- Infiltrates
- Increased interstitial markings
- Masses
- Absence of normal margins
- Air bronchograms
- Increased vascularity
- Loss of cardiac border

- Consolidation
Collapsed lung

Mediastinal shift toward right

Absent vascular markings
Hemothorax