

Pediatric Radiology Review

Swapan Kumar Ray

Professor and HOD, Pediatrics, Icare Institute of Medical sciences And Research, Dr. B C Roy Hospital, Haldia, Purba Medinipur, WB

Interpretation of X-Ray Chest :

Interpretation of X-ray Chest is of immense importance in pediatric practice. Although sophisticated gadgets are very much use in our day to day practice yet role of conventional radiographic examination cannot be ignored rather still remains the corner stone of basic investigation. Plain & Fluoroscopy constitute 80-85% of paediatric study. And other investigations like USG(8-12%), CT (3-5%), MRI(2-4%), Nuclear Medicine(2-4%) and Vascular & interventional Procedure (0.5-1%) contribute the rest. Among plain X-rays, Chest X-ray takes its share of 65 to 70%. So one must know how to read Chest x-rays properly and methodically.

Abcs Of Interpretation Chest X-ray

- A-----Abdomen
- B-----Bones
- C-----Chest
- S-----Soft tissues

So everybody must learn a methodical approach so that it becomes routine practice and thus missing findings may be minimised.

Reading CXR's

- Have a structured method!
- Be consistent with that method
- Please don't take short cuts
- Look at all your patients xrays yourself
- Practice...Practice... Practice

Chest X-ray

- Views- PA, Lat, AP, lateral decubitus (oblique view-- in cardiac investigation).
- Steps of interpretation (from outside inward)
 1. soft tissue shadows
 2. bones
 3. domes of diaphragm
 4. trachea
 5. cardiac silhouette
 6. superior mediastinal & hilar shadows
 7. costophrenic sulci
 8. lung fields

This approach of reading Chest X-Ray will be very helpful as chance of missing even subtle findings would be narrow.

Difference between PA and AP views

AP VIEW

Heart appears larger
Heart details not well visualized
Clavicles higher in position
Ribs appear parallel
Scapulae more sharper and close to film
Disc spaces (cervical) more clearly seen

PA VIEW

Not magnified
Heart well delineated
Clavicles are not high up
Anterior ends look downward
Scapulae are more likely to be drawn laterally
Disc spaces (cervical) not clearly seen

Adequacy of a skiagram

One should be able to count 10 posterior and 6 anterior ribs in Supine AP view

Three Main Factors Determine the Technical Quality of the Radiograph

- ❑ Inspiration
- ❑ Penetration
- ❑ Rotation

Inspiration

The chest radiograph should be obtained with the patient in full inspiration to help assess intrapulmonary abnormalities.

At full inspiration, the diaphragm should be observed at about the level of the 8th to 10th rib

posteriorly, or the 5th to 6th rib anteriorly.

Expiratory film is required to diagnose

- ❑ Pneumothorax
- ❑ Foreign bodies

Expiration reduces lung volume, making a small pneumothorax easier to see.

Penetration

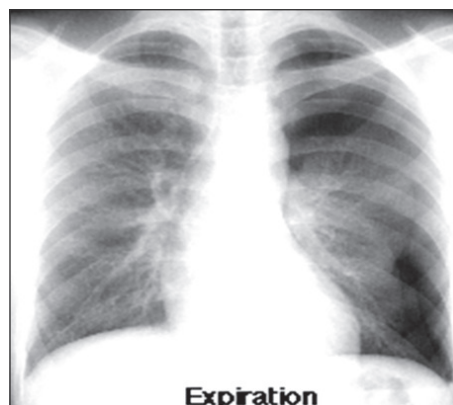
a properly exposed chest radiograph:

- ❑ The lower thoracic vertebrae should be visible through the heart
- ❑ The bronchovascular structures behind the heart (trachea, aortic arch, pulmonary arteries, etc.) should be seen



Inspiration

Fig. 1



Expiration

Fig. 2

Prerequisites For Proper Chest X-ray



Fig. 3

Frontal film

Both pedicles of spine and Broncho-vascular markings Should be visible through

Cardiac shadow

□ Lateral film :

More caudal thoracic vertebral

Underexposure

In an underexposed chest radiograph, the cardiac shadow is opaque, with little or no visibility of the thoracic vertebrae.

The lungs may appear much denser and whiter, much as they might appear with infiltrates present.

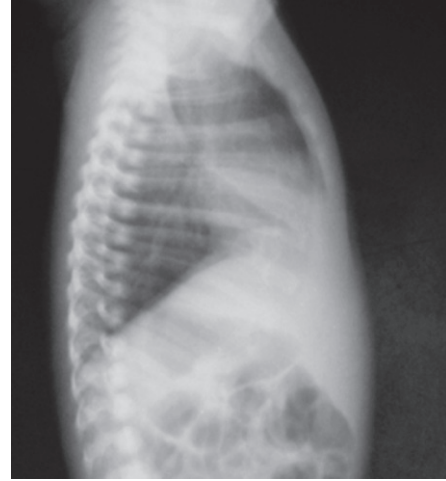


Fig. 4

Bodies should appear darker than Cranial ones.



Fig. 5

Over exposure :

With greater exposure of the chest radiograph, the heart becomes more radiolucent and the lungs become proportionately darker. In an overexposed chest radiograph, the air-filled lung periphery becomes extremely radiolucent, and often gives the appearance of lacking lung tissue, as would be seen in a condition such as emphysema.



Fig. 6

Rotation

Patient rotation can be assessed by observing the clavicular medial heads and determining whether they are equal distance from the spinous processes of the thoracic vertebral bodies.



Fig. 7

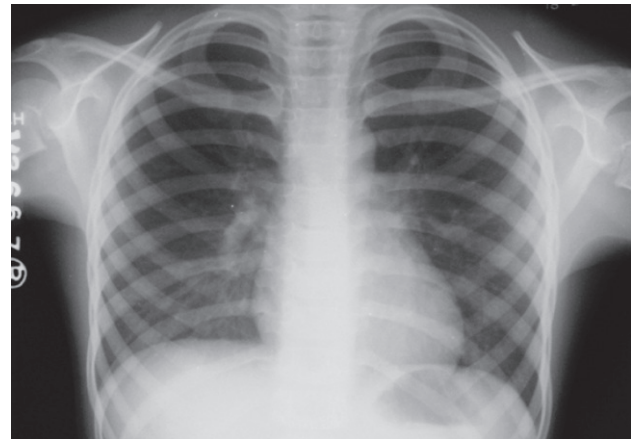


Fig. 8 Normal Chest X-ray

Now you must learn how to read out a normal Chest X-Ray. It should be methodical and structured. Vig.

X-ray chest PA view shows normal soft tissues, visualized bones and the diaphragm. Trachea is central in position. Cardiac silhouette

appears normal. Superior mediastinal and hilar shadows appear normal. Costophrenic angles are clear. Lung fields are clear. No other significant finding.

Impression: Normal appearance.