

Imaging of the Respiratory System: Chest X-ray and Computed Tomography

Prof. Nuray Haliloglu

Ankara University Faculty of Medicine

Department of Radiology

Chest X-ray=Chest Radiograph

- Common study in practice
- Quick
- Easily accessible
- Cheap
- Can be performed at bedside but;
- Not very sensitive for many pathologies



Indications

- Respiratory Diseases
- Cardiac Diseases
- Thoracic Trauma
- Pneumoperitoneum (free air in abdomen)
- Pre-operative and post-operative imaging
- Check position of tubes and catheters (endotracheal tube, intracardiac devices, etc)
- Explore foreign bodies
- Evaluate symptoms related to abdominal pathology

Chest X-ray=Chest Radiograph



X-ray tube

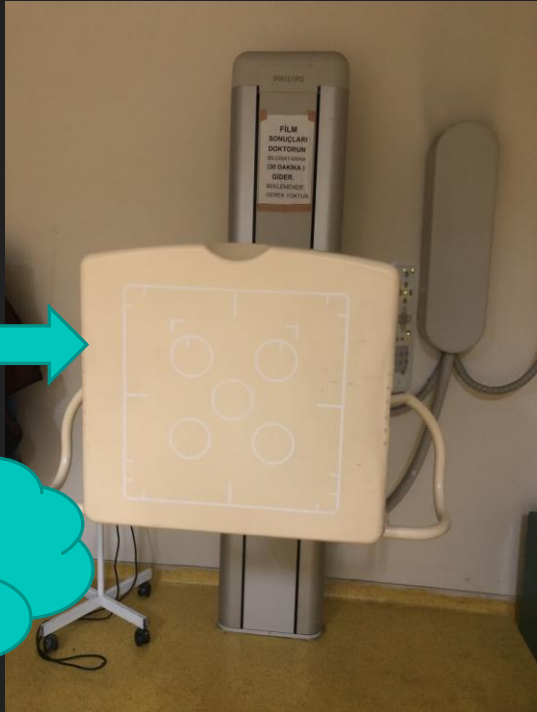
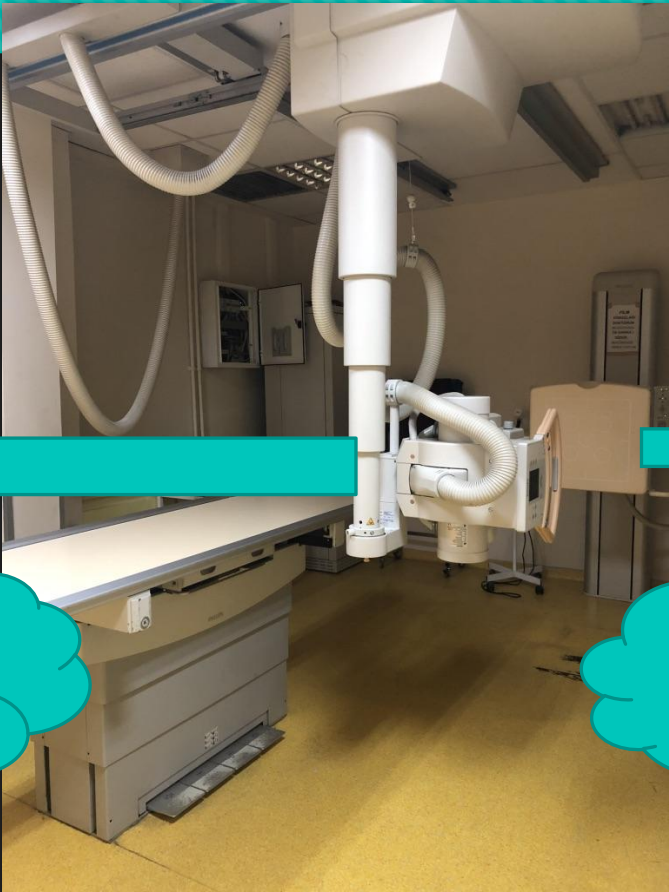


Image receptor

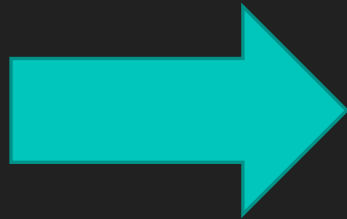
Posteroanterior (PA) Chest X-ray

- Standard Chest X-ray projection
- Patient is erect
- Facing the upright image receptor (detector)
- The chin is raised



Posteroanterior (PA) Chest X-ray

- Standard Chest X-ray projection
- Shoulders are rotated anteriorly
- Hands placed on the posterior aspect of the hips or around the image receptor (in hugging position)



To move scapulae laterally out of the imaging field

Posteroanterior (PA) Chest X-ray

- Patient is erect
- Facing image receptor (detector)
- The chin is up
- Shoulders are rotated anteriorly
- Scapulae are moved off the imaging field
- **DEEP INSPIRATION**



LATERAL PROJECTION

- Confirm location of abnormalities detected on PA projection
- Check for abnormalities hidden on PA projection
- Prefer to use PA and lateral projection together



INTERPRETATION

- Before you start;
- Check the name of the patient and the date of the examination

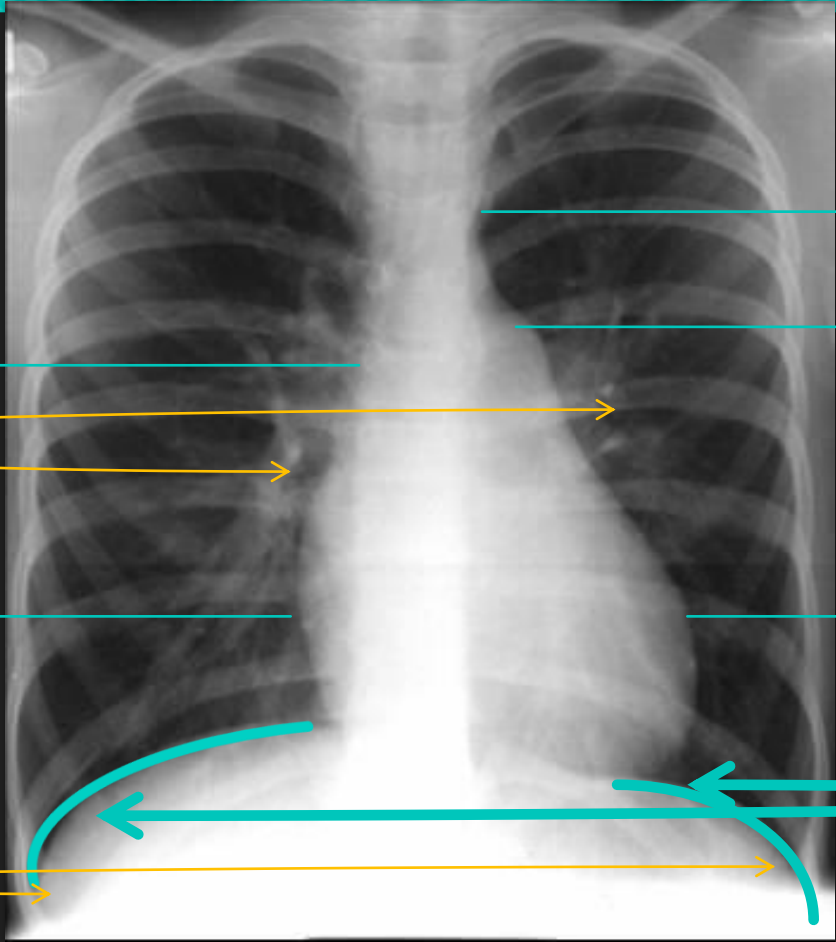
INTERPRETATION

- Have a systematic approach
- Check the chest wall, bones, and abdomen
- Check the mediastinum, heart and hili
- Check and compare lungs

INTERPRETATION

- OLD FILMS ARE OUR BEST FRIENDS
- DON'T FORGET TO ASK FOR THEM

ANATOMY



VENA CAVA SUPERIOR

HILUM

RIGHT ATRIUM

COSTOPHRENIC ANGLES

AORTA

PULMONARY CONUS

LEFT VENTRICLE

DIAPHRAGM

RIGHT VENTRICLE



LEFT ATRIUM

LEFT VENTRICLE

Computed Tomography (CT)

- Cross sectional imaging
- Uses X-ray!!!!
- Fast and easy method
- Excellent anatomic detail
- Patients should hold breath for a short period of time

Computed Tomography (CT)

- Heart
- Airways
- Lungs
- Mediastinum
- Associated bones and soft tissues can be evaluated

Indications

- Evaluation of abnormalities identified on a chest radiograph
- Diagnosis and staging of lung cancer
- Detection of metastasis from known extrathoracic malignancies
- Assessment of congenital anomalies of the thoracic great vessels
- Characterization of interstitial lung disease
- Chest Trauma
- Pulmonary embolism

Computed Tomography (CT)



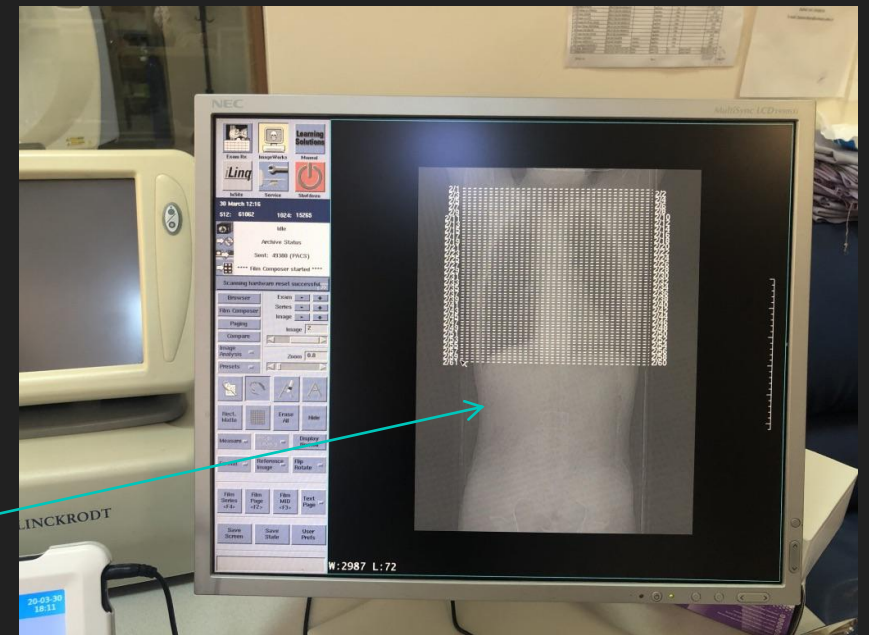
Operating console



Scanner

- Patient in supine position
- Standard axial images
- With or without intravenous contrast material
- Scan from clavicles to costophrenic angles

Scout image: A radiograph to guide the technician; where to start and to stop scanning



- Patient in supine position
- **Standart axial images**
- With or without intravenous contrast material
- Scan from clavicles to costophrenic angles



LearningRadiology



Radiopaedia

Radiology Assistant