CXR

heart & mediastinum

1. Cardiothoracic ratio
   - On the PA film, the transverse diameter of the cardiac outline is compared to the widest transverse dimension of the chest
   - A ratio greater than 50% is suggestive of cardiac enlargement
2. Normal mediastinal contours
   - Right side
     - Trachea, paratracheal soft tissue stripe and right upper lobe
     - Superior vena cava
     - Right lung hilum—normally 2 cm higher than the left hilum
     - Right atrium
     - Right cardiophrenic angle
   - Left side
     - Trachea, paratracheal soft tissue stripe and left upper lobe
     - Aortic knuckle
     - Left lung hilum
     - Left atrial appendage
     - Left ventricle
     - Left cardiophrenic angle

technical aspects

1. Correct patient, time, date
2. Direction of X-ray beam:
   - PA (posteroanterior; film placed in front of patient), AP (anteroposterior; film behind patient) or lateral film
   - Usually designated by a film marker
   - On a PA film the scapulae are laterally located in comparison to the supine AP film, where they are found medially
3. Patient position—erect, supine, lateral decubitus
   - This is usually designated by a film marker; a marker also designates the right or left side of the body on the film
   - The supine AP film is most commonly obtained in ventilated critically ill patients who are unable to sit up and support a board in front of them. Interpretation differs significantly from that of the erect PA film by virtue of the differing effects of gravity:
     - Pneumothorax presents as anterior free air with abnormal anterior diaphragmatic lucency and, classically, the 'deep sulcus sign'
     - Upper lobe prominence or diversion of the pulmonary vasculature may be normal
     - Pleural effusion settles posteriorly, producing a 'veiling' opacity of the hemithorax rather than a classic meniscus sign
     - The significance of the ratio of the cardiac silhouette to thoracic diameter is limited
4. Rotation—heads of clavicles should be symmetrically positioned in relation to the sternal notch and spinous process of the adjacent thoracic vertebrae
5. Positioning of patient on film—all areas of interest should be visualised
6. Adequate inspiration—at least five anterior ribs should be fully visible
7. Exposure—the lower half of the thoracic vertebral bodies should be just visible behind the heart

bones

1. Fractures and lytic lesions should always be sought
2. The following bones should be inspected:
   - lower cervical, thoracic and upper lumbar vertebrae
   - ribs
   - clavicles
   - scapulae
   - upper humeri

soft tissues

1. Diaphragmatic outlines—right side normally higher than left side
2. Normal stomach bubble under left hemidiaphragm
3. Skin folds
4. Calcifications—heart valves, costal cartilages, airways, pleura (e.g. asbestosis)

lungs & pleural cavity

1. Knowledge of the location of the fissures is the key to localising the lung lobes (Figs 11.1–11.3):
   - Horizontal fissure—on the right side runs from the hilum to the sixth anterior rib laterally
   - Oblique fissure—runs from the level of the fourth thoracic vertebral body to the sixth anterior rib anteriorly
   - The azygous lobe is a normal variant on the right adjacent to the mediastinum. The azygous fissure subdivides the upper lobe in approximately 1% of individuals (Fig 11.3)
2. Lungs should be examined for asymmetry between sides:
   - opacification and mass lesions
   - hyperlucency

indwelling devices

1. All tubes, lines and devices should be identified and their position commented upon. Examples include:
   - endotracheal or tracheostomy tubes—the tip should be at least 2 cm above the carina or located between the clavicular heads
   - central venous lines—the tip should be just above the right atrium; note in a left-sided superior vena cava the catheter lies along the left upper mediastinal border
   - pulmonary artery catheter—the tip should not extend lateral to the medial and middle thirds of the diameter of the ipsilateral hemithorax
   - intra-aortic balloon pump—this should be located distal to the left subclavian artery but above the renal arteries; the position of the tip corresponds to just above the left main bronchus or in the third anterior left intercostal space; if an inflated intra-aortic balloon can be seen this is indicative of diastole in the cardiac cycle