Canadian Family Medicine Clinical Card

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Chest X-Ray Interpretation

3. Analyze lateral CXR projection:

Retrosternal Clear Space:
- If opacified, consider "4 Ts" *(in order of commonality in adults)*: 1) Thymoma, 2) Terrible lymphoma, 3) Teratoma, 4) Thyroid tumor

Hilum:
- Look for changes (enlargement, shifts, asymmetries) in pulmonary vessels, main-stem bronchi, and lymph nodes
- Extra opacification around pulmonary vessels and bronchi = hilar lymphadenopathy

Spinal column:
- Assess vertebral bodies for densities and abnormal shapes or compressions
- Assess intervertebral disc spaces: if not well-defined, may indicate discitis
- Assess neural foramina (holes between vertebral processes). If enlarged: likely tumor or cyst. If narrowed: likely bony enlargement impinging on spinal nerves

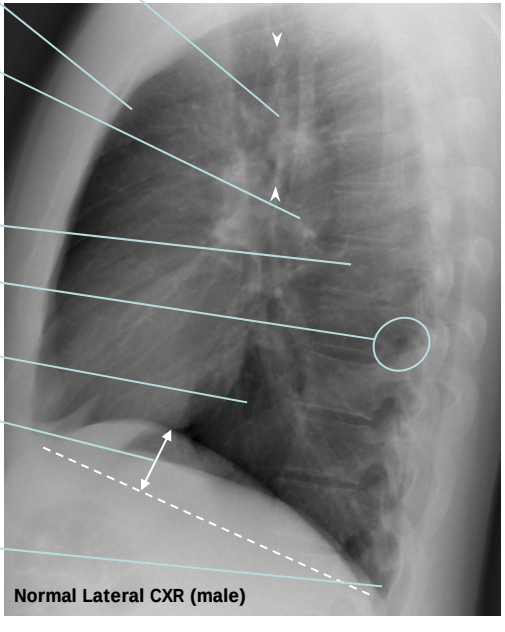
Clear space posterior to heart:
- If opacified: consolidation, atelectasis, enlarged vessels, masses, or hiatus hernias

Diaphragm:
- Flat if height above anterior-posterior costophrenic angle "line" is <2.7cm
- Flat diaphragm = lung hyperinflation due to airway obstruction (asthma, COPD)

Costo-phrenic angles
- Small pleural effusions best picked up with lateral projection (most commonly due to congestive heart failure)

Mediastinum:
- Note posterior para-tracheal tissue line between the anterior trachea & the posterior esophagus (between white arrowheads): if <3mm, can rule out lymphadenopathy

- The retro-cardiac space is blocked from view in the frontal projection. Lateral projections can visualize this hidden anatomy, and is also a better reflection of total lung volume



Normal Lateral CXR (male)

4. Important notes to keep in mind:

- **Findings that require immediate attention**:
  - Tracheal Shift: may indicate a **tension pneumothorax** on the side opposite to the tracheal shift. If suspected on Hx/exam, don't do CXR; immediately decompress
  - Free air under R hemi-diaphragm: **bowel perforation,** urgent surgery consult needed. (Note that air under L hemi-diaphragm is usually the gastric bubble)
  - Massive cavitations & infiltrates, especially in upper lobes, in the context of cough & fever: suspect **active tuberculosis,** isolate patient and work up to establish diagnosis
  - Complete white-out of lung fields: **severe pulmonary edema,** stabilize and transport for definitive ER/ICU care

- Most common CXR false-negatives (real findings that were not detected):
- Airspace disease (i.e. consolidation)
- Apical and retro-cardiac densities
- Solitary pulmonary nodules
- Mediastinal widening
- Cardiomegaly, changes in heart contour

- Ask for previous CXRs to track CXR changes, especially to monitor solitary pulmonary nodules for any changes

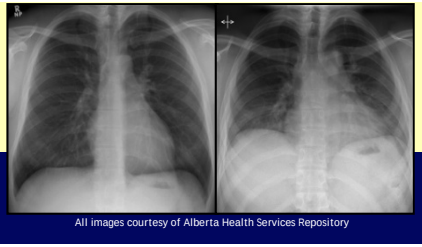
- Lower lung lobes can normally appear to be opacified by both breast and fatty tissue

Other CXR types/views:

- An AP frontal CXR is done for pts who can't stand (i.e. quite ill, babies), and when a portable CXR is needed. Note that the AP view 1) magnifies the heart and 2) may shrink apparent lung volume

- Expiratory View is done to accentuate:
- Air trapping: localize area of obstruction
- Pneumothorax
- *Do not confuse expiratory views for pulmonary vasculature congestion, restrictive lung disease, or pneumonia*

- Right: Normal PA CXR
- Far Right: same patient, expiratory CXR



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Key References (continued from previous card): Petinaux B *et al.* Accuracy of radiographic readings in the emergency department. *Am J Emerg Med.* 2011 Jan; 29(1):18-25. Gatt ME *et al.* Chest radiographs in the emergency department: is the radiologist really necessary? *Postgrad Med J.* 2003 Apr; 79(930):214-7. Klein EJ *et al.* Discordant radiograph interpretation between emergency physicians and radiologists in a pediatric emergency department. *Pediatr Emerg Care.* 1999 Aug; 15(4):245-8.