The authors and reviewers have made every attempt to ensure the information in the Family Medicine Clinical Cards is correct – it is possible that errors may exist. Accordingly, the source references or other authorities should be consulted to aid in determining the assessment and management plan of patients. The Cards are not meant to replace customized patient assessment nor clinical judgment. They are meant to highlight key considerations in particular clinical scenarios, largely informed by relevant guidelines in effect at the time of publication. The authors cannot assume any liability for patient outcomes when these cards are used.

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.

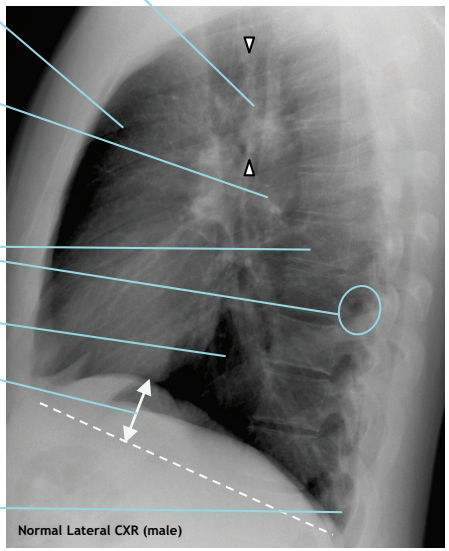
Clear space posterior to heart:
- If opacified: consolidation, atelectasis, enlarged vessels, masses, or hiatus hernias.

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.

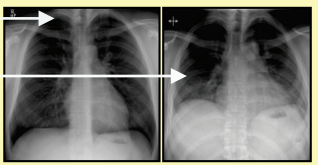
Other CXR Types / Views:

- 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;29(1):18-25. Gatt ME, et al. Chest radiographs in the emergency department: is the radiologist really necessary? *Postgrad Med J.* 2003;79(930):214-7

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