

Examination of the Respiratory System

Wash your hands & Introduce the exam to your patient

Positioning & Draping

- while seated or standing, the patient should be exposed to the waist
- ? patients can be uncovered intermittently

Inspection

- be sure to look from anterior & posterior angles as well as from the patient's side
- Look for:
 - masses, scars, and lesions (trauma)
 - atrophy/hypertrophy
 - clubbing
 - cyanosis
 - peripheral (fingernails)
 - central (buccal mucosa & under the tongue)
 - respiratory effort
 - intercostal indrawing
 - accessory muscle use
 - bony abnormalities
 - Pectus excavatum (funnel chested), Pectus carinatum (pidgeon chested), Barrel chested, Kyphosis, Scoliosis

ANTERIOR EXAM

Palpation

- Trachea
 - palpate the trachea to ensure that it is the midline
- Chest expansion
 - place your palms on the patient's chest with your thumbs parallel to each other near the midline

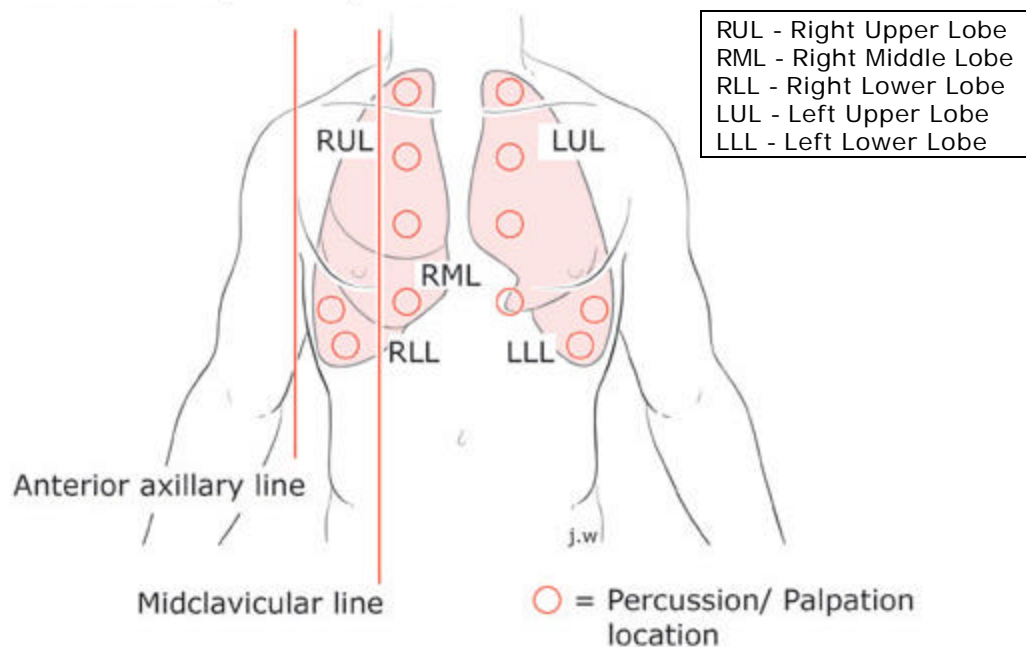
- lightly pinch the skin between your thumbs
- ask the patient to take a deep breath → observe for equal, bilateral expansion
- Tactile fremitus
 - place the ulnar side of your hand on the areas of patient's chest outlined in Figure 1. Do not forget the apices of the lungs! They rise above the level of the clavicles.
 - instruct the patient to say "boy-o-boy" each time they feel your hand on their back
 - palpate for vibrations while the patient says "boy-o-boy"
 - comment on the increased or decreased tactile fremitus for each lung lobe and compare tactile fremitus for each side

Percussion

- Percussion of lung fields
 - percuss in each of the areas outlined in Figure 1. Do not forget the apices of the lungs!
 - comment on the percussion notes for each lung lobe and compare the percussion notes for each side

Figure 1:

Anterior Respiratory Exam



Auscultation

- Breath sounds
 - auscultate for equal and bilateral air entry
 - listen over each lobe of the lungs (see Figure 1). Comment on and compare the breath sounds with respect to each lobe. Listen for and describe any bronchial, vesicular, and adventitious breath sounds.
 - Whisper pectoriloquy –with your stethoscope the over area of possible pathology, have the patient whisper the phrase ‘one-two-three’. Listen to hear if the sound is distorted. Confirm that a similar change is **absent** over the identical location on the contralateral chest.
 - Egophony - with your stethoscope over the area of possible pathology, have the patient vocalize the vowel ‘EEEE’. Listen for the sound to be distorted into the sound ‘AHHH’. Confirm that a similar change is **absent** over the identical location on the contralateral chest.

POSTERIOR EXAM

Palpation

- Chest expansion
 - place your palms on the patient’s back with your thumbs parallel to each other near the midline
 - lightly pinch the skin between your thumbs near the midline
 - ask the patient to take a deep breath → observe for equal, bilateral expansion
- Tactile fremitus
 - place ulnar side of your hand on the areas of patient’s back outlined in Figure 2. Do not forget the apices of the lungs!

- instruct the patient to say “boy-o-boy” each time they feel your hand on their back
- palpate for vibrations while the patient says “boy-o-boy”
- comment on increased or decreased tactile fremitus for each lung lobe and compare tactile fremitus for each side

Percussion

- Diaphragmatic excursion
 - during tidal breathing, percuss from the mid-posterior thorax downward to find the level at which the percussion note changes from resonant to dull. This is the level of the diaphragm.
 - ask the patient to inspire fully and hold their breath. Repeat your percussion technique and use a pen to mark the new level at which the percussion note changes.
 - let the patient rest for ~30 seconds
 - ask the patient to fully expire and hold it. Repeat your percussion technique and use a pen to mark the new level at which the percussion note changes.
 - the distance between the 2 marks is your estimation of diaphragmatic excursion. Normally, it is ~5 cm.
- Percussion of lung fields
 - avoid percussing too close to the vertebrae and the scapulae
 - TIP: you may find it easier to percuss if you ask the patient to cross their arms in front of their body so that each hand is touching the opposite shoulder. This moves the scapulae away from the lung fields.
 - percuss in each of the areas outlined in Figure 2. Do not forget the apices of the lungs.
 - comment on the percussion notes for each lobe of the lungs and compare the percussion notes for each side

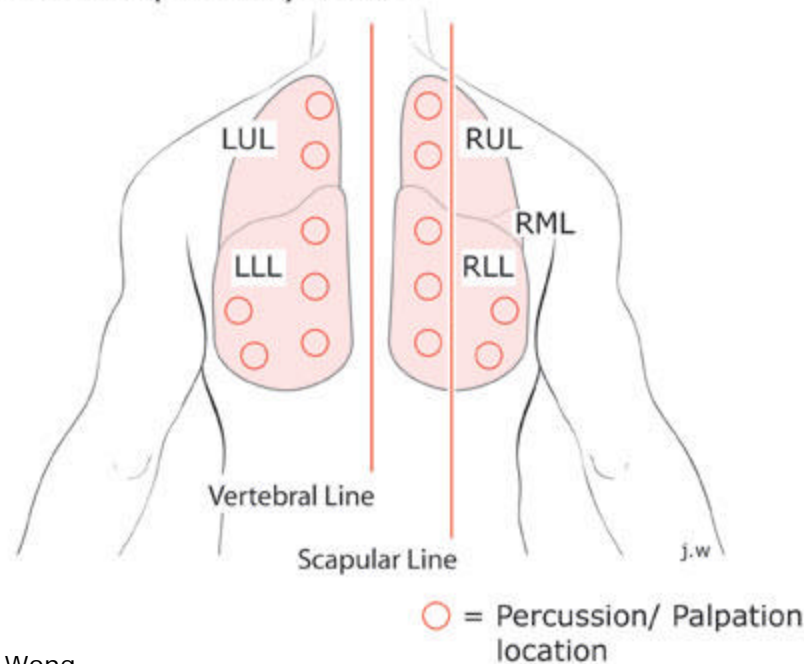
Auscultation

- Breath sounds

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- Whisper pectoriloquy -with your stethoscope over the area of possible pathology, have patient whisper the phrase 'one-two-three'. Listen to hear if the sound is distorted. Confirm that a similar change is **absent** over the identical location on the contralateral chest.
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Figure 2:

Posterior Respiratory Exam



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**Table 1:
Differential diagnosis of conditions using respiratory
examination results**

Disorder	Mediastinal Displacement	Chest Wall Movement	Vocal Fremitus	Percussion Note	Breath Sounds	Added Sounds	Voice Sounds
Pleural Effusion	Heart displaced to opposite side	Reduced over affected area	Affected area markedly decreased	dull	Absent over fluid; bronchial at upper border	Absent; pleural rub may be found above effusion	Absent over effusion; incr. with egophony over upper border
Consolidation	none	Reduced over affected area	Incr. or normal	dull	bronchial crackles		Incr. with egophony and whispering pectoriloquy
Pneumothorax	Tracheal deviation to opposite if under tension	Decr. over affected side	Absent	Resonant	Absent or decr.	Absent	Absent
Atelectasis	Ipsilateral shift	Decr. over affected area	Variable	Dull	Absent or diminished	Crackles may be heard	Absent
Bronchospasm	None	Decr. symmetrically	Normal or Decr.	Normal or Decr.	Broncho-vesicular	Wheeze	Normal or Decr.
Interstitial fibrosis	None	Decr. symmetrically	Normal or Incr.	Normal	Broncho-vesicular	End-inspiratory crackles unaffected by cough or pressure	