

Auscultation



Auscultation is perhaps the most important and effective clinical technique you will ever learn for evaluating a patient's respiratory function. Before you begin, there are certain things that you should keep in mind:

- a) It is important that you try to create a quiet environment as much as possible. This may be difficult in a busy emergency room or in a room with other patients and their visitors. Eliminate noise by closing the door and turning off any radios or televisions in the room.
- b) The patient should be in the proper position for auscultation, (sitting up in bed or on the examining table), ensuring that his or her chest is not leaning against anything. If this is not possible, ask for assistance or perform only a partial assessment of the patient's breathing.
- c) Your stethoscope should be touching the patient's bare skin whenever possible or you may hear rubbing of the patient's clothes against the stethoscope and misinterpret them as abnormal sounds. You may wish to wet the patient's chest hair with a little warm water to decrease the sounds caused by friction of hair against the stethoscope.

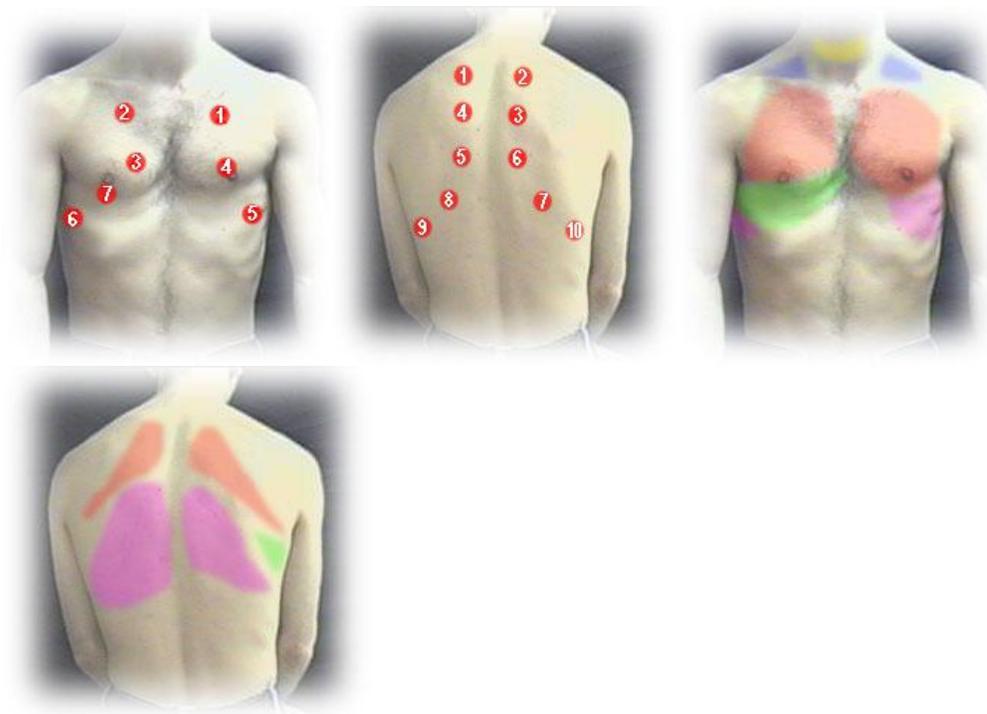
d) Always ensure patient comfort. Be considerate and warm the diaphragm of your stethoscope with your hand before auscultation.

As you are auscultating your patient, keep in mind these 2 questions:

- 1) Are the breath sounds increased, normal, or decreased?
- 2) Are there any abnormal or adventitious breath sounds?

To assess the posterior chest, ask the patient to keep both arms crossed in front of his/her chest, if possible. Auscultate using the diaphragm of your stethoscope. Ask the patient not to speak and to breathe deeply through the mouth. Be careful that the patient does not hyperventilate. You should listen to at least one full breath in each location. It is important that you always compare what you hear with the opposite side.

There are 12 and 14 locations for auscultation on the anterior and posterior chest. You should listen to at least 6 locations on both the anterior and posterior chest. Begin by auscultating the apices of the lungs, moving from side to side and comparing as you approach the bases. Making the order of the numbers in the images below a ritual part of your pulmonary exam is a way of ensuring that you compare both sides every time and you'll begin to know what each area should sound like under normal circumstances. If you hear a suspicious breath sound, listen to a few other nearby locations and try to delineate its extent and character.



Breath Sounds (consider deleting...need further editing)

1. Normal Breath Sounds

These are traditionally organized into categories based on their intensity, pitch, location, and inspiratory to expiratory ratio. Breath sounds are created by turbulent air flow. In inspiration, air moves into progressively smaller airways with the alveoli as its final location. As air hits the walls of these airways, turbulence is created and produces sound. In expiration, air is moving in the opposite direction towards progressively larger airways. Less turbulence is created, thus normal expiratory breath sounds are quieter than inspiratory breath sounds.

Abnormal Adventitious

Tracheal breath sounds are very loud and relatively high-pitched. The inspiratory and expiratory sounds are more or less equal in length. They can be heard over the trachea which is not routinely auscultated.

Vesicular Breath Sound

The vesicular breath sound is the major normal breath sound and is heard over most of the lungs. They sound soft and low-pitched. The inspiratory sounds are longer than the expiratory sounds. Vesicular breath sounds may be harsher and slightly longer if there is rapid deep ventilation (eg post-exercise) or in children who have thinner chest walls. As well, vesicular breath sounds may be softer if the patient is frail, elderly, obese, or very muscular.

Bronchial Breath Sound

Bronchial breath sounds are very loud, high-pitched and sound close to the stethoscope. There is a gap between the inspiratory and expiratory phases of respiration, and the expiratory sounds are longer than the inspiratory sounds. If these sounds are heard anywhere other than over the manubrium, it is usually an indication that an area of consolidation exists (ie space that usually contains air now contains fluid or solid lung tissue).

Bronchovesicular Breath Sound

These are breath sounds of intermediate intensity and pitch. The inspiratory and expiratory sounds are equal in length. They are best heard in the 1st and 2nd ICS (anterior chest) and between the scapulae (posterior chest) - ie over the mainstem bronchi. As with bronchial sounds, when these are heard anywhere other than over the mainstem bronchi, they usually indicate an area of consolidation.

2. Abnormal Breath Sounds

Absent or Decreased Breath Sounds

There are a number of common causes for abnormal breath sounds, including:

ARDS: decreased breath sounds in late stages

Asthma: decreased breath sounds

Atelectasis: If the bronchial obstruction persists, breath sounds are absent unless the atelectasis occurs in the RUL in which case adjacent tracheal sounds may be audible.

Emphysema: decreased breath sounds

Pleural Effusion: decreased or absent breath sounds. If the effusion is large, bronchial sounds may be heard.

Pneumothorax: decreased or absent breath sounds

Bronchial Breath Sounds in Abnormal Locations

Bronchial breath sounds occur over consolidated areas. Further testing of egophony and whispered pectoriloquy may confirm your suspicions.

3. Adventitious Breath Sounds

Crackles (Rales)

Crackles are discontinuous, nonmusical, brief sounds heard more commonly on inspiration. They can be classified as fine (high pitched, soft, very brief) or coarse (low pitched, louder, less brief). When listening to crackles, pay special attention to their loudness, pitch, duration, number, timing in the respiratory cycle, location, pattern from breath to breath, change after a cough or shift in position. Crackles may sometimes be normally heard at the anterior lung bases after a maximal expiration or after prolonged recumbency.

The mechanical basis of crackles: Small airways open during inspiration and collapse during expiration causing the crackling sounds. Another explanation for crackles is that air bubbles through secretions or incompletely closed airways during expiration.

Conditions:

ARDS

asthma

bronchiectasis

chronic bronchitis

consolidation

early CHF

interstitial lung disease

pulmonary edema

Wheeze

Wheezes are continuous, high pitched, hissing sounds heard normally on expiration but also sometimes on inspiration. They are produced when air flows through airways narrowed by secretions, foreign bodies, or obstructive lesions. Note when the wheezes occur and if there is a change after a deep breath or cough. Also note if the wheezes are monophonic (suggesting obstruction of one airway) or polyphonic (suggesting generalized obstruction of airways).

Conditions:

asthma

CHF

chronic bronchitis

COPD

pulmonary edema

Rhonchi

Rhonchi are low pitched, continuous, musical sounds that are similar to wheezes. They usually imply obstruction of a larger airway by secretions.

Stridor

Stridor is an inspiratory musical wheeze heard loudest over the trachea during inspiration. Stridor suggests an obstructed trachea or larynx and therefore constitutes a medical emergency that requires immediate attention.

Pleural Rub

Pleural rubs are creaking or brushing sounds produced when the pleural surfaces are inflamed or roughened and rub against each other. They may be discontinuous or continuous sounds. They can usually be localized a

particular place on the chest wall and are heard during both the inspiratory and expiratory phases.

Conditions:

pleural effusion

pneumothorax

Mediastinal Crunch (Hamman's sign)

Mediastinal crunches are crackles that are synchronized with the heart beat and not respiration. They are heard best with the patient in the left lateral decubitus position. As with stridor, mediastinal crunches should be treated as medical emergencies.

Conditions:

pneumomediastinum