

Pulmonary Auscultation^{1,2}

Narrative Section

HISTORICAL VIGNETTE - The stethoscope is an iconic symbol of the medical profession, but until the beginning of the nineteenth century, clinicians placed an ear against the chest wall to perform direct auscultation. When he published his 1819 pioneering work on auscultation, French physician René Laennec introduced a new method of examination. He wrote that faced with examining “a young woman” who he could not easily examine “on account of the great degree of fatness” of the chest wall, Laennec rolled “a quire of paper into kind of a cylinder.” He placed the tube against her chest and “could thereby perceive the action of the heart in a manner much more clear and distinct” than direct auscultation. Thus began the birth of the stethoscope. Laennec went on to describe various breath sounds in his *Treatise on the Disease of the Chest* which represented both normal and abnormal sounds within the chest. Over the two centuries since his publication, the nomenclature of breath sounds has simplified into a few key terms. Knowing these can help all clinicians at the bedside.



CONTEXT AND USEFULNESS - The ability to describe breath sounds in novice clinicians provides a gateway into the diagnostic possibilities of pulmonary pathology, as well as other organ systems. The American Thoracic Society has simplified Leannec’s initial descriptions according to location, pitch, and frequency of the sound transmitted through the chest.

¹ Chi J *et. al.* “The Five Minute Moment.” *Am J Med.* **2016 Aug**; 129 (8): 792-795.

² McGee, Steven. *Evidence-Based Physical Diagnosis, 3rd ed.* Philadelphia, PA: Elsevier; 2007.

Physical Manuever

Model Proper (And Improper)

Technique - The first step is recognizing the two categories of normal breath sounds appreciated during a pulmonary exam. When listening posteriorly, the sounds heard over the lung fields are known as *vesicular breath sounds*. Leannec described these soft, breathy noises like leaves rustling in a breeze. Moving the stethoscope to the anterior chest over the trachea or the right apex, one can appreciate *bronchial breath sounds*. These harsher sounds have a more prominent expiratory component, sounding like air forced through a tube. If the “tubular” sound of bronchial breath sounds are heard laterally or posteriorly, they are abnormal. Another normal breath sound is vocal resonance, the sound of a voice auscultated through the chest, normally muffled, weak, and unintelligible.



As a group, the abnormal breath sounds are collectively known as *adventitial breath sounds*. Three common abnormal chest sounds with a pulmonary cause are crackles, wheezes, and rhonchi. *Crackles* are discontinuous sounds (i.e., sounds made when hair is rubbed together or Velcro pulled apart), and can be coarse (low pitched) or fine (high pitched). *Wheezes* are continuous high-pitched sounds whereas *rhonchi* are continuous, low-pitched sounds. Finally, *abnormal vocal resonance* can be heard when the voice is transmitted through pulmonary consolidations.

INTERPRETATION - The pathogenesis of abnormal breath sounds is myriad. To accurately describe disease, though, a mastery of the nomenclature serves the clinician well.

CAVEAT AND COMMON ERRORS - Knowledge of pulmonary anatomy helps to recognize auscultated sounds from extra-pulmonary sources, such as stridor (upper airway) and rubs (pleura).