

in restrictive pathophysiology. Inability to complete a sentence in conversation is generally a sign of severe impairment and should result in an expedited evaluation of the patient.

Percussion of the chest is used to establish diaphragm excursion and lung size. In the setting of decreased breath sounds, percussion is used to distinguish between pleural effusions (dull to percussion) and pneumothorax (hyper-resonant note).

The role of palpation is limited in the respiratory examination. Palpation can demonstrate subcutaneous air in the setting of barotrauma. It can also be used as an adjunctive assessment to determine whether an area of decreased breath sounds is due to consolidation (increased tactile fremitus) or a pleural effusion (decreased tactile fremitus). To detect unilateral disorders of ventilation, the symmetry and degree of chest wall expansion can be assessed during a deep inspiration by placing one's thumbs together at the midline over the lower posterior chest while grasping the lateral rib cage.

The majority of the manifestations of respiratory disease present as abnormalities of auscultation. Wheezes are a manifestation of airway obstruction. While most commonly a sign of asthma, peribronchial edema in the setting of congestive heart failure can also result in diffuse wheezes, as can any other process that causes narrowing of small airways. Wheezes can be polyphonic, involving multiple different size airways (e.g., asthma), or monophonic, involving one size airway (e.g., bronchogenic carcinoma). For these reasons, clinicians must take care not to attribute all wheezing to asthma.

Rhonchi are a manifestation of obstruction of medium-sized airways, most often with secretions. In the acute setting, this manifestation may be a sign of viral or bacterial bronchitis. Chronic rhonchi suggest bronchiectasis or COPD. In contrast to expiratory wheezes and rhonchi, stridor is a high-pitched, focal inspiratory wheeze, usually heard over the neck as a manifestation of upper airway obstruction.

Crackles, or rales, are commonly a sign of alveolar disease. Processes that fill the alveoli with fluid may result in crackles, including pulmonary edema and pneumonia. Crackles in pulmonary