Breath Sounds

Auscultation
- = listening for sounds produced in the body
- over chest – to ID normal & abnormal lung sounds
- all BS made by turbulent flow in the airways
- useful in making initial Dx & evaluating effects of Rx

- 4 characteristics
  › pitch (vibration frequency)
  › amplitude or intensity (loudness)
  › distinctive characteristics
  › duration of inspiration compared to expiration
**Terminology**

- **Tracheal**
  - normal sound heard over trachea
  - loud tubular quality
  - high-pitched
  - expiration equal to or slightly longer than inspiration

- **Bronchovesicular**
  - similar to tracheal BS
  - heard over upper 1/4 of sternum & between scapulae
  - not as loud
  - slightly lower in pitch
  - equal inspiration & expiration

- **Vesicular BS**
  - normal sound heard over lung parenchyma
  - soft, muffled
  - low in pitch & intensity
  - difficult to hear
  - heard best during inspiration, minimally during expiration
Terminology

- Respiratory disease may alter intensity of BS =
  - Absent in extreme cases
  - If intensity increases =
  - expiration equals inspiration

Terminology

- Adventitious BS
  - abnormal
  - classified as continuous
  - discontinuous
    - intermittent, short duration

Terminology

- Rales
  - discontinuous
  - popularity of term has declined
  - now use -
    - also called -

- Wheezes
  - continuous
  - musical
  - due to
**Terminology**

- **Rhonchi**
  - low-pitched
  - continuous
  - confusing, also being abandoned

- **Stridor**
  - heard
  - continuous
  - due to
  - loud, high pitched
  - can sometimes be heard without stethoscope

---

**Terminology**

- when abnormal BS heard, note
  - type
  - location
  - timing

---

**Adventitious BS**

- Bronchial BS heard in lung parenchyma
  - occurs when lung increases in density (consolidated)
Adventitious BS

- Diminished BS
  - decreased intensity
  - shallow breathing
  - obstructed airways
  - pneumothorax
  - pleural effusion
  - obesity

- Adventitious BS
  - Wheeze
    - vibration of wall of narrowed airway as high velocity air passes through
    - causes
    - 
    - 
    - tighter the compression → higher the pitch
    - note characteristics
    - 

- Adventitious BS
  - Wheezing may be
    - polyphonic
      - limited to expiration
      - notes begin and end simultaneously
      - indicate obstruction of
    - monophonic
      - single or multiple, each 1 indicating obstruction of a bronchus
      - notes begin and end at different time and may overlap
      - single monophonic
Adventitious BS

- Stridor
  - similar to wheezing
  - due to upper airway obstruction
  - usually heard only during inspiration
  - cause
  - life-threatening

- Crackles - fine
  - collapsed airways “pop” open during inspiration
  - early inspiratory crackles
    - bronchioles & larger, more proximal close during expiration
    - “pop” occurs early in inspiration
    - not silenced by cough or change in position
  - crackles in peripheral alveoli & airways “pop” open during inspiration
  - late inspiratory crackles
    - peripheral alveoli & airways close during expiration
    - “pop” occurs late in inspiration
    - occur late in inspiration
    - more common in
    - may clear with changes in posture
Adventitious BS

- Crackles - coarse crackles
  - caused by air movement through secretions or fluid in airways
  - heard during inspiration & expiration
  - often clear if patient coughs or is suctioned
  - used to be called

Adventitious BS

- Don’t be fooled!!

Adventitious BS

- Pleural friction rub
  - creaking or grating
  - pleural surfaces are inflamed and rough edges are rubbing together during breathing
  - heard only during inspiration or during both phases
  - similar to coarse crackles but are not affected by coughing
  - hard to identify
Adventitious BS

- **Subcutaneous emphysema**
  - air from pulmonary air leak collects in subcutaneous tissues
  - can be localized or spread as far as legs
  - produce cracking sound and sensation when palpated

Heart Sounds

- **Heart anatomy**
  - lies between lungs in mediastinum so that right ventricle is more anterior than left ventricle
  - upper portion contain atria - “base” of heart
    - lies directly beneath upper middle sternum
  - lower portion contain ventricles - “apex” of heart
    - points downward and left to point near midclavicular line and beneath margin of sternum and 5th rib

Heart Sounds

- Separate findings into six categories
  - 1st & 2nd Heart Sounds
  - 3rd & 4th Heart Sounds
  - Clicks & Snaps
  - Murmurs
  - Rubs
Heart Sounds

- 1st and 2nd heart sounds
  - typically described as a “lub-dub”
  - “lub” (S₁)
  - results from closure of the tricuspid and mitral valves
  - low-pitched, relatively long sound
  - represents the beginning of ventricular systole
  - “dub” (S₂)
  - marks the beginning of ventricular diastole
  - produced by closure of the aortic and pulmonic semilunar vavles when the intraventricular pressure begins to fall
  - heard as a sharp snap
  - a brief pause occurs after the 2nd heart sound when the heart is beating at a normal rate - pattern that one hears is: “lub-dub” pause, “lub-dub” pause, and so on

- Loud S₂
  - due to more forceful closure of
  - increased intensity of S₂ common finding in

- 3rd and 4th heart sounds
  - ventricular wall vibrations
  - sign of heart disease in patients > 40 yo
    - S₃
      - usually indicates a ventricular abnormality
      - heard
    - S₄
      - heard
      - indicates diminished vent. wall compliance with increased resistance to filling
      - syst. hypertension, ischemic heart disease, aortic stenosis, acute mitral valve regurgitation
Heart Sounds

- Murmurs
  > due to an incompetent AV valve or stenotic semilunar valve
  > produce high-pitched swooshing sound

<table>
<thead>
<tr>
<th>SYSTOLIC</th>
<th>DIASTOLIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>incompetent AV valve - allow backflow of blood into atria during systole</td>
<td>stenotic AV valve - obstructs blood flow from atrium during diastole</td>
</tr>
<tr>
<td>stenotic pulmonic valve - obstructs blood flow during systole</td>
<td>incompetent pulmonic valve - allows backflow of blood into ventricle immediately after systole</td>
</tr>
</tbody>
</table>

http://www.blaufuss.org/