Examination of the Chest and Lungs

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Inspection

- Shape and symmetry of the chest.
- AP diameter of the chest is ordinarily less.
- **Barrel chest**: Asthma, emphysema, cystic fibrosis.
- Kyphosis, scoliosis, pectus carinatum, p. excavatum.
- **Skin**: cyanosis or pallor. Supernumerary nipples.
- Superficial venous pattern.
Pectus excavatum
Pectus carinatum
Respiration

- Respiratory rate
- Pattern (Rhythm) of respiration
- Symmetric expansion of the chest?
- Respiration too shallow or deep?
- Regularity?
- Apnea?
- Dyspnea?
Dyspnea

- Difficult and labored breathing with shortness of breath (pulmonary ?, cardiac ?)
  - Tachypnea
  - Retractions at the suprasternal notch, intercostally or at the xiphoid process.
  - Dilate and flare of the nares
    - Cyanosis, clubbing, barrel chest.
## Respiratory rate per minute

<table>
<thead>
<tr>
<th></th>
<th>Newborn</th>
<th>1 –12 m.</th>
<th>1-5 age</th>
<th>5-12 age</th>
<th>&gt;12 age</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 (30-60)</td>
<td>25-35</td>
<td>20-30</td>
<td>20-25</td>
<td>16-20</td>
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Patterns of respiration

- **Apnea**: The absence of spontaneous respiration more than 20 (15) seconds (with bradycardia and cyanosis)
- **Bradypnea**: Slow respiration (Neurologic or electrolyte disturbance)
- **Tachypnea**: Rapid respiration (AGE!!!)
- **Hypopnea**: Shallow respiration (Pleuritic pain)
Pattern of respiration

- Hyperpnea: Deep breathing (Exercise, anxiety, CNS and metabolic diseases)
- Cheyne-Stokes:
- Biot:
- Kussmaul:
- Periodic breathing:
Patterns of respiration

- **Normal**: Regular and comfortable at a rate of 12-20 per minute.
- **Bradypnea**: Slower than 12 breaths per minute.
- **Tachypnea**: Faster than 20 breaths per minute.
- **Hyperventilation (hyperpnea)**: Faster than 20 breaths per minute, deep breathing.
- **Sighing**: Frequently interspersed deeper breath.
- **Air trapping**: Increasing difficulty in getting breath out.
- **Cheyne-Stokes**: Varying periods of increased depth interspersed with apnea.
- **Kussmaul**: Rapid, deep, labored.
- **Biot**: Irregularly interspersed periods of apnea in a disorganized sequence of breaths.
- **Ataxic**: Significant disorganization of respiration, irregular and varying depth of respiration.
Clubbing
Percussion

- Normally: **Sonor (!)**
- Hyperresonance: Emphysema, asthma, pneumothorax.
- **Dullness**: Atelectasis, pleural effusion, consolidation, tm, pleural thickening
- **Tympanic**: Traube (!)
Palpation

- Pulsations, tenderness, bulges, depression, unusual position.
- Crepitus: Subcutaneous air!
- Tactile fremitus
- Thoracic expansion

The thumbs are at the level of the tenth rib.
Tactile fremitus

- **Decreased or absent:** Excess air in the pleural space, emphysema, pleural thickening, atelectasis, massive pulmonary edema.
- **Increased:** Consolidation, solid mass (rare)
Auscultation

- Breath sounds are absent:
  - Fluid or pus in the pleural space.
  - Air in the pleural space.
  - Atelectasis.
  - Tm in the great area.

- Breath sounds are increased (Tuber sufl, bronchial sound): Consolidation
Auscultation

- Duration of the expiration is prolonged in obstructive lung diseases:
  - Asthma bronchiale
  - Bronchiolitis
Rals (Pathologic breath sounds)

**Fine crackles:** high-pitched, discrete, discontinuous crackling sounds heard during the end of inspiration; not cleared by a cough

**Medium crackles:** lower, more moist sound heard during the midstage of inspiration; not cleared by a cough

**Coarse crackles:** loud, bubbly noise heard during inspiration; not cleared by a cough

**Rhonchi (sonorous wheeze):** loud, low, coarse sounds like a snore most often heard continuously during inspiration or expiration; coughing may clear sound (usually means mucus accumulation in trachea or large bronchi)

**Wheeze (sibilant wheeze):** musical noise sounding like a squeak; most often heard continuously during inspiration or expiration; usually louder during expiration

**Pleural friction rub:** dry, rubbing, or grating sound, usually caused by inflammation of pleural surfaces; heard during inspiration or expiration; loudest over lower lateral anterior surface