INSPECTION
A) ABNORMALITIES OF THE SKIN

1. Ulcers, sinuses, nodules:
   - Ulcers, sinuses discharging caseous material (TB) or sulfur granules (Actinomycosis).
   - Nodules: metastases, lipoma, neurofibromatosis.
2. Pigment: hyperpigmentation* - tattoo marks - Café au lait*.
5. Dilated venous channels (in SVC obstruction).
7. Enlarged breast: gynecomastia*.

**Causes of Gynacomastia**

1. Familial gynecomastia.
2. Testicular tumors.
4. Others:
   - CLD, malnutrition.
   - Hyperthyroidism.
   - Adrenal tumors.

<table>
<thead>
<tr>
<th>Causes of Skin Hyperpigmentation</th>
<th>Causes of Café au lait spots</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Addison’s disease (adrenal hypofunction).</td>
<td>1- Congenital, familial.</td>
</tr>
<tr>
<td>• Pregnancy, oral CCP (due to ↑ sex hrs).</td>
<td>2- Acquired:</td>
</tr>
<tr>
<td>• Deposition of iron: hemochromatosis.</td>
<td>b) Benign genetic diseases:</td>
</tr>
<tr>
<td></td>
<td>- neurofibromatosis (skin patches, tumors in brain, sp cord, nerves).</td>
</tr>
<tr>
<td></td>
<td>- tuberous sclerosis (skin acne, patches, brain seizures, lung leiomyoma, CRF).</td>
</tr>
<tr>
<td></td>
<td>b) Gaucher’s disease: deposition of sphingolipids in skin, brain, lung, kidney, liver, spleen.</td>
</tr>
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**Causes of Café au lait spots**

1. Addison’s disease (adrenal hypofunction).
2. Pregnancy, oral CCP (due to ↑ sex hrs).
4. Deposition of iron: hemochromatosis.

**B) PRESENCE OF DYSPNEA, PAIN AND NOISES:**
The patient may be:
- Dyspneic: on O2, nebulizer therapy.
- With audible noises at the mouth: rhonchi, crackles, stridor, grunting, snoring.

**C) SIZE, SHAPE AND SYMMETRY:**
Normal chest:
- Symmetrical in shape, elliptical in cross section.
- Anteroposterior: Transverse diameter = 5:7
- Shoulders are sloping.
- Ribs are oblique making 45º with the spine.
- Subcostal angle is usually acute (90º ± 20º).

**Abnormalities:**

**Symmetrical Abnormalities:**

- Flat, Rachitic, Barrel, Pigeon, & Funnel chest.

1. Rachitic Chest: due to vit D deficiency, shows:
   - Harrisons' sulcus: transverse groove at the level of insertion of diaphragm to ribs.
   - Rosary beads: due to enlargement of the costo-chondral junctions.
   - Pigeon shape and spinal deformities: may occur.

**Asymmetrical Abnormalities**

Include:
- Localized bulging/localized retraction.
- Spinal deformities.
- On clinical exam, the side which moves better is the normal side.
2. Barrel chest (Emphysematous)
   - Shoulders are transverse, ↑↑ thoracic kyphosis.
   - ↑ AP diameter, it equals transverse diameter
   - Wide intercostals spaces with horizontal ribs.
   - Wide subcostal angle.

3. Pigeon Chest (Pectus Carinatum)
   - Localized bulge of the sternum forming an anterior ridge.
   - ↑ AP diameter.
   - Indrawing of ribs forming Harison sulcus.
   - Occurs in childhood due to:
     - Rickets & osteomalacia.
     - Uncontrolled childhood asthma → hyperinflation with repeated contraction of diaphragm on pliable bony thorax.

4. Funnel Chest (Pectus Excavatum)
   - Localized depression of lower end of sternum.
   - ↓ AP diameter.
   - Ribs are protruding.
   - Limited chest expansion
   - Occurs as congenital abnormality or acquired in shoe makers.
   - Occurs as congenital abnormality or acquired in shoe makers.
   - Asymptomatic but severe cases → heart is displaced to Lt → ↓ ventilatory capacity.

**Localized Bulging**
- Subcutaneous emphysema, edema, inflammation.
- Tumors, bone deformities.
- Massive pleural effusion, tension pneumothorax.
- Empyema necessitans.
- Pleural tumors.

**Localized Retraction**
- Chest wall
- Bone deformities.
- Thoracoplasty.
- Pleura
- Pleural thickening (after pleural effusion, empyema, hemothorax).
- Lungs
- Fibrosis: from TB, lung abscess.
- Collapse: due to bronchial obstruction.
- Mediastinum
- Fibrosing mediastinitis
- Abdomen
- Abdominal incisions

**D) DESCRIBE RESPIRATORY MOVEMENTS**

1. **Type of movement**:
   - Thoracic or abdominal.
   - Constricting dress causes preponderance of thoracic movements.

2. **Range of movement**.

3. **Symmetry**: bilateral symmetry and thoraco-abdominal symmetry.

4. **Pattern of breathing**: normal or abnormal.
   - Normal breathing: Regular with occasional deep breaths (sighs).
   - Quiet, effortless – chest moves freely with respiration.
   - Rate 8 – 16/min (44 in infants).
   - Bilateral symmetry of chest expansion.
   - Thoraco-abdominal symmetry of respiration.
E) EVIDENT PULSATIONS

1. Apex beat:
   • the most inferolateral point in the left side of chest at which the cardiac impulse can be distinctly felt.

Site:
   • L5 space, ⅛ inch inside MCL (3.5 inches = 9 Cm from the median plan).
   • 1½ inches below, ½ inch medial to left nipple in ♂.


3. Epigastric pulsations:
   • from RVH (coming from the apex)
   • Liver (expansile pulsations in TR)
   • Aorta (aneurysm → transmitted pulsations).

4. Left parasternal pulsations (heave): in RVH.
5. Left 2nd space pulsations: in PA dilatation.

Abnormalities of Apex Beat
1) From the Heart:
   • Absent: dextrocardia, pericardial effusion, poor LV function.
     (also with obesity, COPD).
   • Shifted outward only: RVH.
   • Shifted outward, downward: LVH.

2) From the Chest:
   - Pull to same side (fibrosis, collapse).
   - Push to other side (pleural effusion, pneumothorax).

3) From the Abdomen:
   - Shifted upwards in pregnancy, ascites, abdominal tumors.

PALPATION

<table>
<thead>
<tr>
<th>Superficial palpation</th>
<th>Deep palpation</th>
</tr>
</thead>
<tbody>
<tr>
<td>To detect local tenderness &amp; subcutaneous emphysema.</td>
<td>a) Confirm 3 signs get by inspection:</td>
</tr>
<tr>
<td>Causes of Local Tenderness</td>
<td>1. Expansion of chest wall &amp; apices of the lungs.</td>
</tr>
<tr>
<td>2. Sternal:</td>
<td>3. Confirm the origin of visible pulsations.</td>
</tr>
<tr>
<td>• Sternal tenderness in leukemia (Liebmans’ sign).</td>
<td>b) TVF.</td>
</tr>
<tr>
<td>• Retrosternal soreness: with cough (tracheitis).</td>
<td>c) Palpable adventitious sounds (rhonchi &amp; rub).</td>
</tr>
<tr>
<td>3. Costal:</td>
<td>Tactile Vocal Fremitus (TVF)</td>
</tr>
<tr>
<td>• Tietz syndrome: costeo-chondritis.</td>
<td>- Tactile = palpable</td>
</tr>
<tr>
<td>• Rib fracture → localized pain, with cough in COPD (7th rib).</td>
<td>- Vocal = initiated at the vocal cords.</td>
</tr>
<tr>
<td>4. Intercostal (Neuro-muscular):</td>
<td>- Fremitus = vibrations</td>
</tr>
<tr>
<td>• Neuralgic pain: with thoracic Herpes Zoster.</td>
<td>• Palpable vibrations initiated at the VC by the voice 44 in Arabic (99 in E) and felt by the palm of fingers over identical areas of chest wall anteriorly, posteriorly and laterally.</td>
</tr>
<tr>
<td>• Myositis pain: with severe cough (COPD, suppurative LD)</td>
<td>• Abnormalities of TVF:</td>
</tr>
<tr>
<td>Amebic hepatitis pain → Rt inframammary tenderness.</td>
<td>1. ↑ in consolidation, cavity surrounded by consolidation</td>
</tr>
<tr>
<td>Causes of Subcutaneous Emphysema:</td>
<td>2. ↓ in obesity &amp; collapse .</td>
</tr>
<tr>
<td>• acute severe asthma, pneumothorax, ICT drainage and rupture esophagus.</td>
<td>3. lost in effusions.</td>
</tr>
<tr>
<td>• C/P: Subcutaneous crepitus: crackling sensation felt on chest palpation over gas containing tissue. May be associated with swelling of the face, neck and chest wall.</td>
<td></td>
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</tbody>
</table>
Expansion of The Chest Wall and Apices of the Lungs

Confirmation of chest movement

Normally: both sides of chest expand equally during tidal and deep breathing.

How to assess: ask the patient to respire deeply & compare 2 sides:

<table>
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<th>Upper chest expansion</th>
<th>Lower chest expansion</th>
<th>Apical chest expansion</th>
</tr>
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<tr>
<td>2 hands are placed flat over the upper chest, compare up &amp; down movements</td>
<td>2 hands are placed to grasp the lower chest with the thumbs meeting in midline and slightly lifted up, thumbs should move apart ≥ 5 Cm.</td>
<td>from behind the patient, fix the thumbs on the 7th Cx vertebra and the fingers reach below the clavicles, compare up &amp; down movements of thumbs</td>
</tr>
</tbody>
</table>

Causes of Limited Chest Expansion

Unilateral ↓↓chest expansion: pleural effusion, pneumothorax, unilateral lung fibrosis, collapse.

Bilateral ↓↓chest expansion: COPD, IPF.

Position of the Mediastinum: by position of trachea & apex beat

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<tr>
<th>TRACHEA</th>
<th>APEX BEAT</th>
</tr>
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<tr>
<td>Normal</td>
<td>Abnormal Position of the upper mediastinum</td>
</tr>
<tr>
<td>1) Crico-suprasternal distance: The distance ( ) cricoid cartilage &amp; suprasternal notch, normally = 3-4 fingers, ↓↓ in lung hyperinflation.</td>
<td>Causes of tracheal deviation: 1. <strong>To the side of lesion:</strong> - Lung fibrosis - Lung collapse - Pneumonectomy. 2. <strong>Away from the lesion:</strong> - Tension pneumothorax - Massive pleural effusion - superior mediastinal mass (RS goitre, thymoma, lung cancer). Trail's Sign: Bulging lower end of the tendon of sternomastoid ms in front of deviated trachea.</td>
</tr>
<tr>
<td>2) Position of trachea: • Ask the patient to look forwards: place the tip of your Rt index finger into the suprasternal notch &amp; press gently against the trachea. • Any deviation from midline is assessed, normally there is slight displacement to the Rt. 3) Tracheal tug.</td>
<td>Displacement of the apex without tracheal deviation occurs with • LVH • pectus excavatum • kyphoscoliosis. Parasternal heave (of RVH &amp; pulmonary HTN) is felt at the Lt sternal edge.</td>
</tr>
</tbody>
</table>

Crico-suprasternal distance

Trail's Sign:

- Inspiratory descent of the trachea.
- Felt by putting the index finger on the thyroid cartilage.
- Occurs with any respiratory distress.

Parasternal heave (of RVH & pulmonary HTN) is felt at the Lt sternal edge.