DYSPNOEA

TUCOM
Dep. of Medicine
3rd year
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27-11-2018

Dyspnea

Learning objectives:

1. **Define dyspnea**
2. **Classify dyspea**
3. **Explain the mechanisms of dyspnea**
4. **Clarify the clinical pattern of dyspnea**
5. **Recognize the causes of dypnea**
6. **Review the clinical approach to dyspnea**

Dyspnea

Dyspnea:

Defined as a subjective feeling of an uncomfortable awareness of breathing. It is a cardinal symptom of cardiopulmonary diseases.

Tachypnea:

Defined as a sign of increased work of breathing (rapid breathing).

Acute dyspnea: (over a period of minutes to days)

Chronic dyspnea: (over months to years)

Mechanisms of dyspnea:

dyspnea results from:

A- Increase work of breathing:

1. Stimulation of intrapulmonary sensory nerves e.g. pneumothorax, interstitial inflammation.
2. Air flow obstruction e.g. asthma, COPD.
3. Decrease lung compliance e.g. pulmonary odema, pneumonia, pneumothorax, pulmonary fibrosis.
4. Restricted chest expansion e.g. Ankylosing spondylitis, respiratory muscle paralysis, kyphoscoliosis.

B- Increase ventilatory drive: stimulation of respiratory centers.

1. Increase arterial H+: metabolic acidosis.
2. Increase arterial PCO2: hypercapnia.
3. Decrease arterial PO2: hypoxia.
4. Ventilation-perfusion mismaching: pulmonary embolism.
5. Increase central arousal: exercise, anxiety, thyrotoxicosis.

Clinical pattern of dyspnea

1. Exertional dyspnea
2. Orthopnea
3. Paroxysmal nocturnal dyspnea
4. Dyspnea at rest
5. Chyen-Stokes breathing
6. Hyperventilation(kussmaul breathing)

1-Exertional dyspnea: it occur at exercise level below that expected for patient age and previous fitness, occur in both respiratory and cardiac diseases.

2-Orthopnea: dyspnea on lying flat (supine position) due to increase venous return to the heart, usually occur in patient with heart failure. It can also be a feature of respiratory muscle weakness, large pleural effusion, massive ascites, morbid obesity or any severe lung disease.

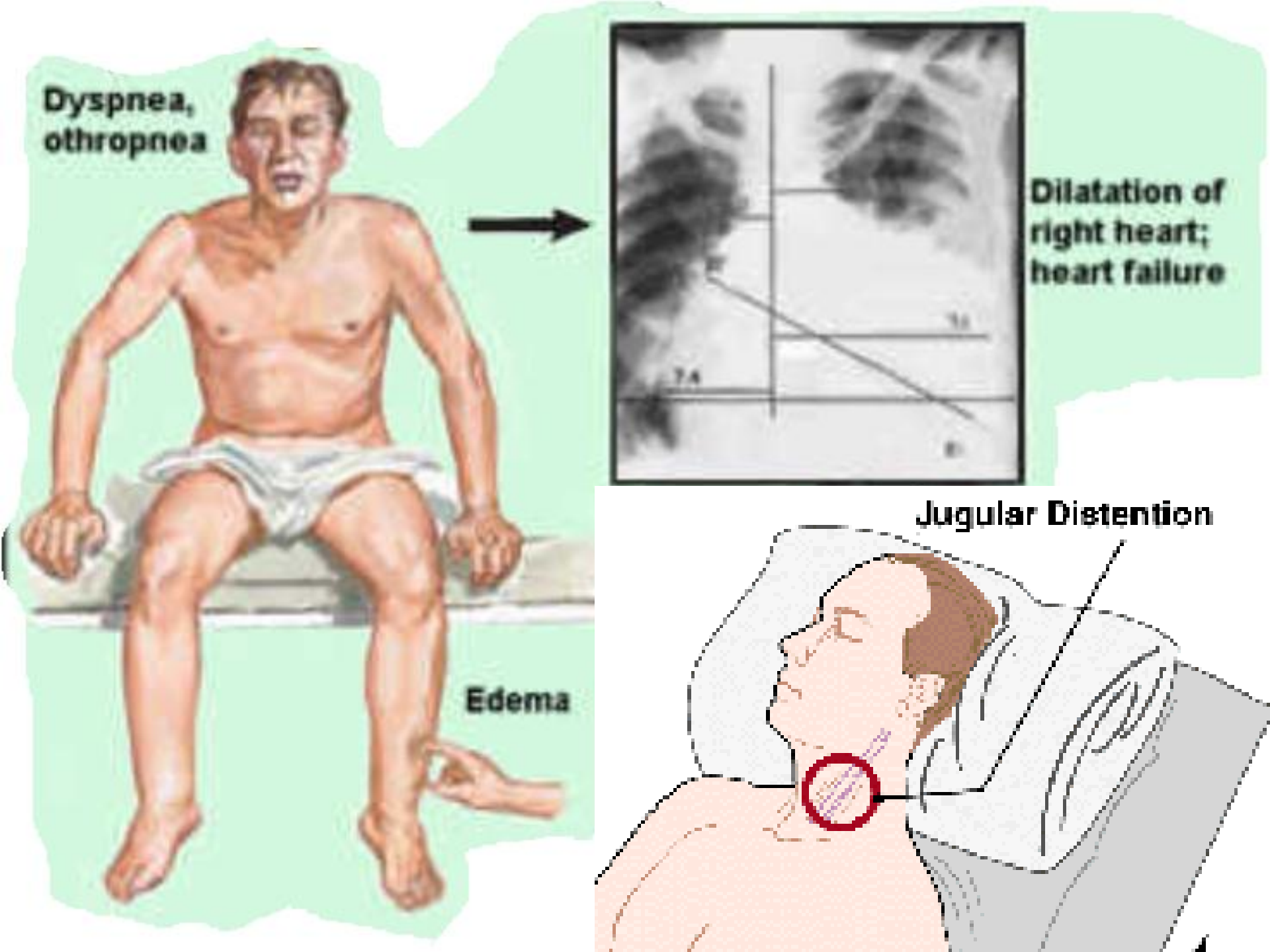
3-Paroxysmal nocturnal dyspnea: is an acute, sever breathlessness that wake the patient from sleep, to sit upright position, gasping in bed, he try to open the windows in an attempt to relieve the distress, associated with cough and frothy sputum, due to fluid shift from peripheral tissue to the circulation within 1-2 hours of sleep, occur in heart failure.

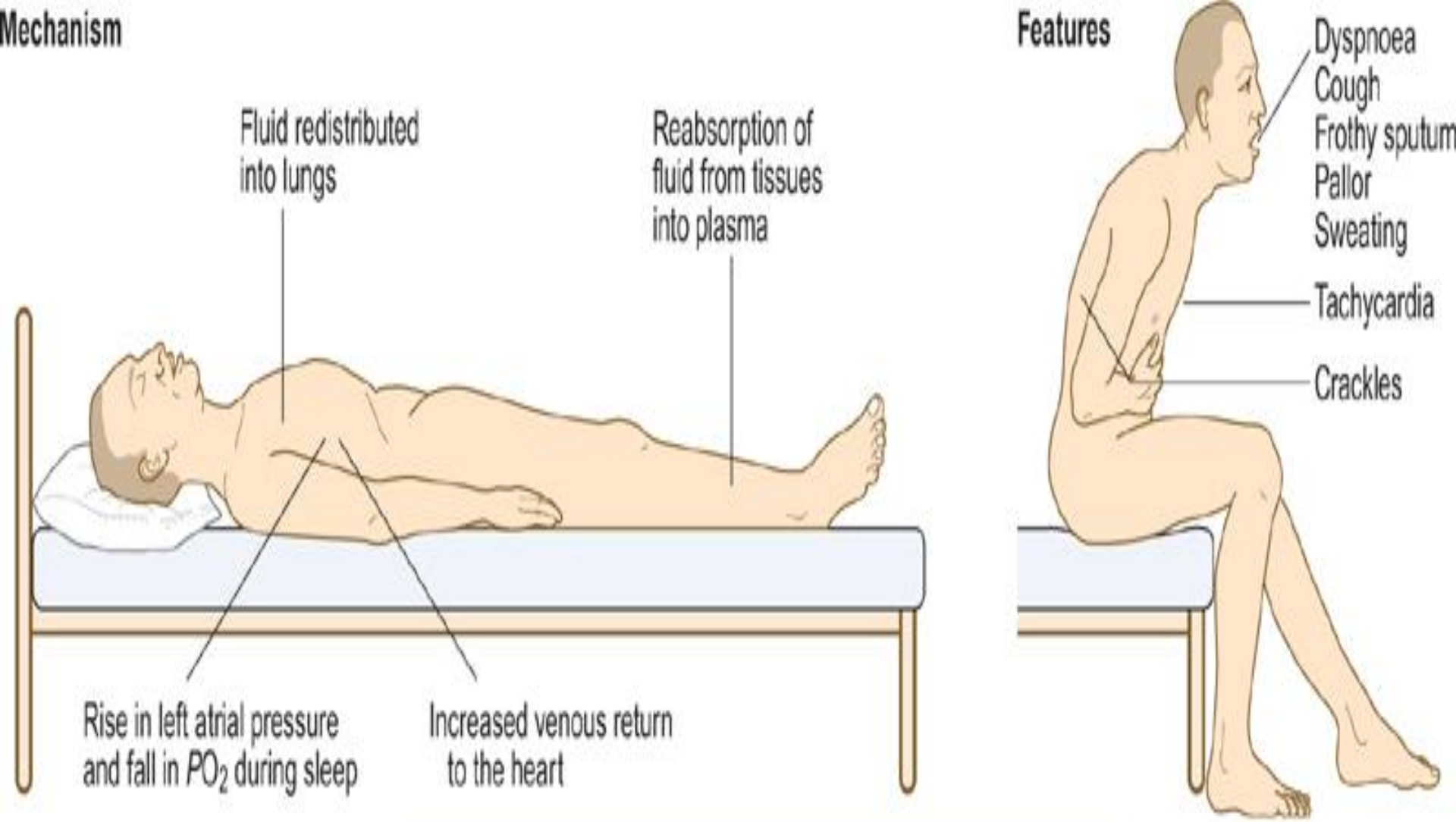
4-Dyspnea at rest: dyspnea even at sitting position which may indicates sever respiratory or cardiac diseases.

5-Chyen-Stokes breathing: is a cyclical variation in the depth of breathing with overventilation alternating with period of cessation of breathing (apnea), due to impaired responsiveness of respiratory centers to CO2, may occur in brain stem stroke or heart failure.

6-Hyperventilation (kussmaul breathing): it is a rapid, deep breathing at a regular rate, as a response to reduced arterial PH in metabolic acidosis.

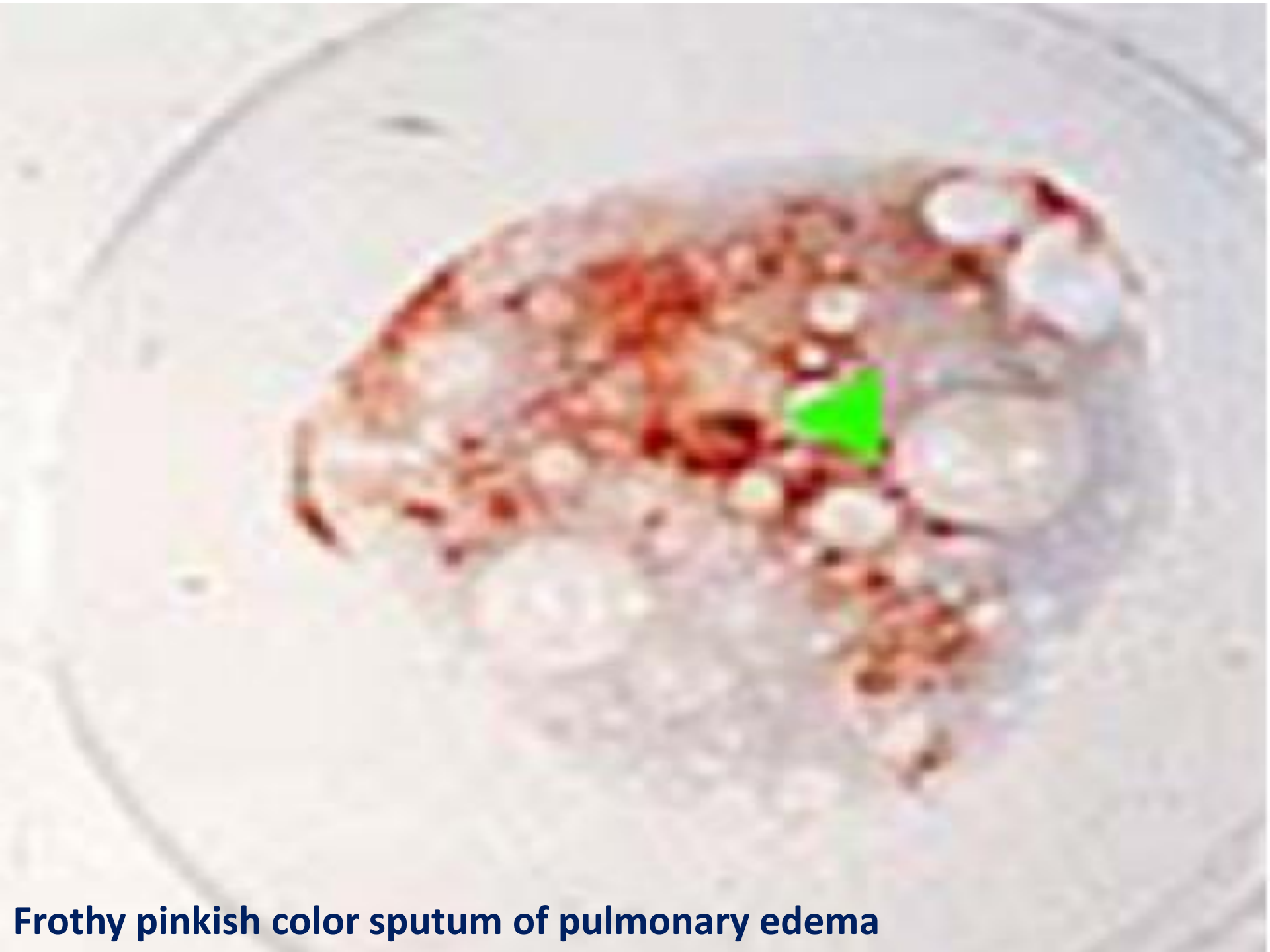
Evidence for increased work of breathing (supraclavicular retractions, use of accessory muscles of ventilation, and the **tripod position**, characterized by sitting with one's hands braced on the knees) is indicative of disorders of the airways (e.g., asthma, emphysema, chronic bronchitis or bronchiectasis)


Dyspnea,
othropnea
Edema
Dilatation of
right heart;
heart failure
Jugular Distention



Causes

- Ischaemic heart disease
- Aortic valve disease
- Hypertension
- Cardiomyopathy
- Atrial fibrillation
- Mitral valve disease
- Atrial tumours



Frothy pinkish color sputum of pulmonary edema

CAUSES OF DYSPNOEA

	Acute dyspnoea at rest	Chronic exertional dyspnoea
Cardiovascular	Acute pulmonary oedema	Chronic heart failure, Myocardial ischaemia (angina equivalent)

	acute	chronic
Respiratory	* Acute severe asthma * Acute exacerbation of COPD * Pneumothorax * Pneumonia * Pulmonary embolism Acute respiratory distress syndrome Inhaled foreign body (especially in the child) Lobar collapse Laryngeal oedema (e.g. anaphylaxis)	* COPD * Chronic asthma Bronchial carcinoma Interstitial lung disease (sarcoidosis, fibrosing alveolitis, extrinsic allergic alveolitis, pneumoconiosis) Chronic pulmonary thromboembolism Lymphatic carcinomatosis Large pleural effusion(s)

	acute	chronic
Others	Metabolic acidosis (e.g. diabetic ketoacidosis, lactic acidosis, uraemia, overdose of salicylates, ethylene glycol poisoning) Psychogenic hyperventilation (anxiety or panic-related)	Severe anaemia Obesity

Grading the degree of a dyspnea

New York heart association score (NYHA)

There are four functional grades of dyspnea as follows:

Grade I: Dyspnea on running or on doing more than ordinary effort e.g. climbing stairs, but occur at exercise level below that expected for patient age and previous fitness.

Grade II: Dyspnea on doing ordinary effort.

Grade III: Dyspnea on doing less than ordinary effort e.g. walking short distances (20–100 m). Comfortable only at rest.

Grade IV: Dyspnea at rest.

The important questions to patients with dyspnea includes:

- **Mode of onset, duration and progression**
- **Variability, relation to special posture and aggravating/relieving factors**
- **Severity**
- **Associated symptoms: e.g. chest pain, cough, wheeze.**

Thanks