Diseases of the Pulmonary Pleura

Biomedical Engineering - URJC

Rafa Carretero, MD, PhD

Internal Medicine Department

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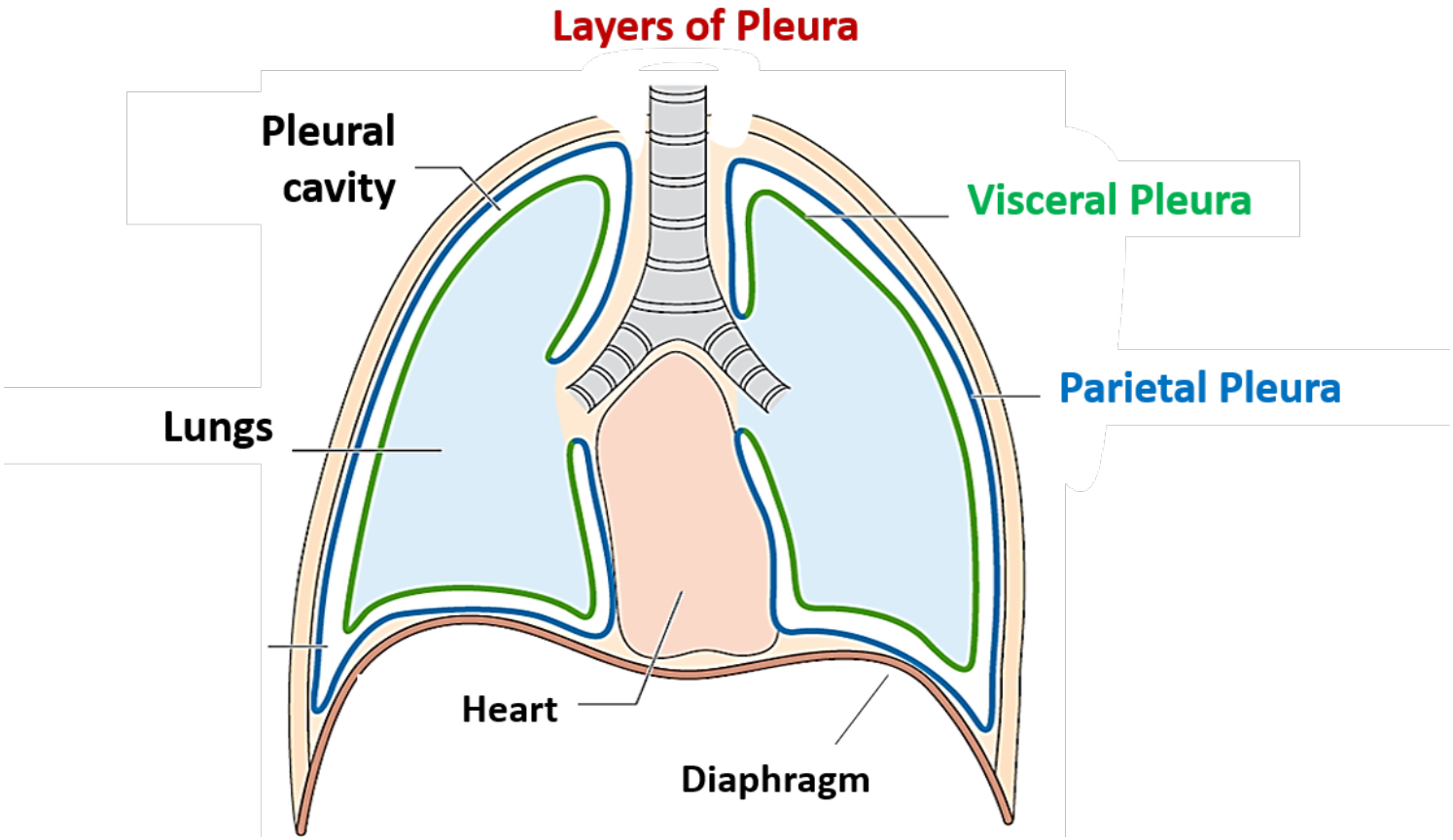
Universidad
Rey Juan Carlos

Understanding Diseases of the Pulmonary Pleura: A Comprehensive Overview

Basic Anatomy of the Pleura

- Pulmonary pleurae: serous membrane layers overlying lungs and chest walls.
- Visceral pleura (lung surface) and parietal pleura (chest wall).
- Pleural cavity: potential space with minimal serous fluid.

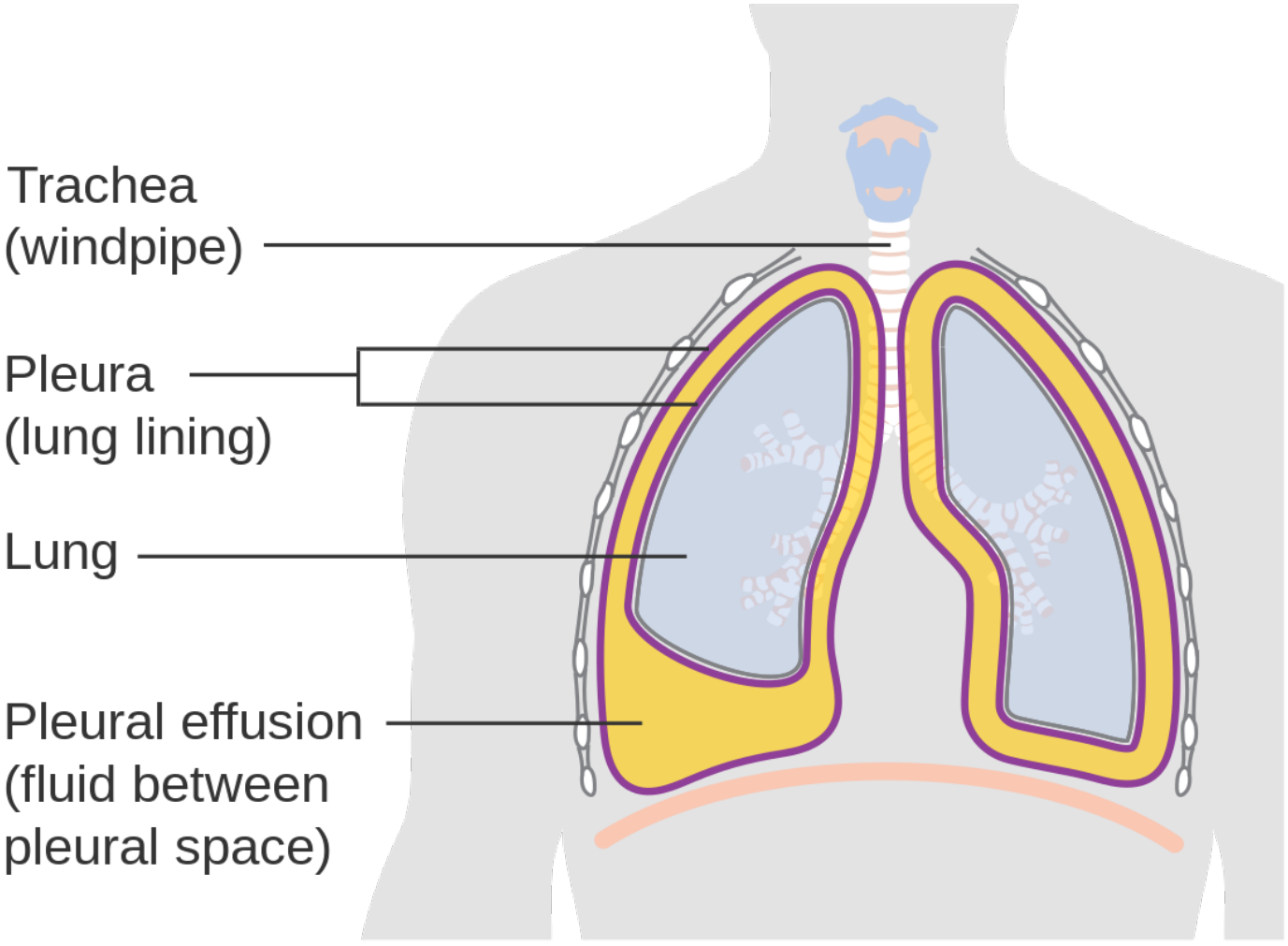
Basic Anatomy of the Pleura



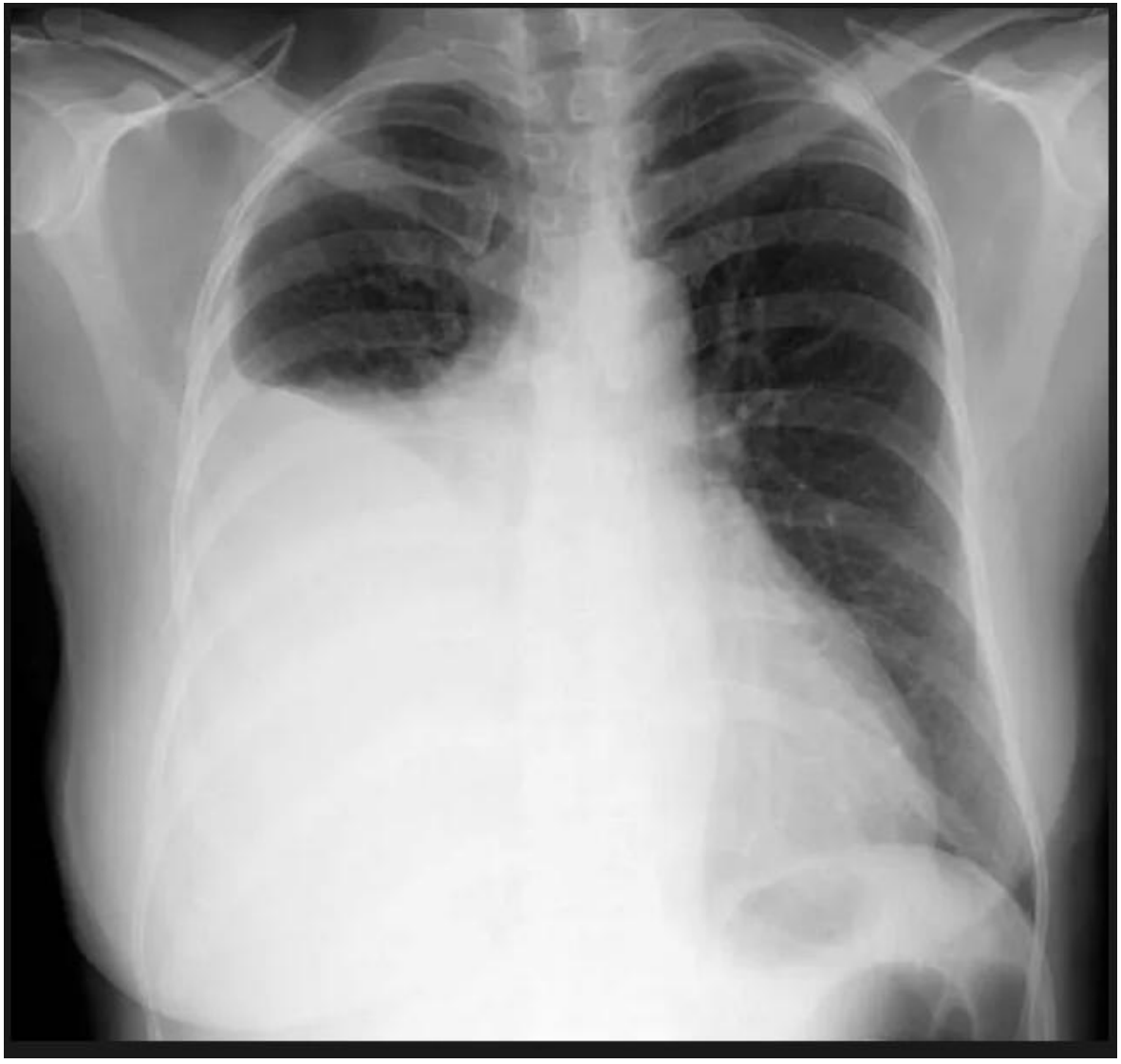
Pleural Effusion

- Results from fluid accumulation between parietal and visceral pleura.
- Normal fluid balance disruption leads to effusion.
- Exudative or transudative effusion based on local or systemic factors.

Pleural Effusion



Pleural Effusion



Exudative Effusion

Exudative Effusion: local inflammation

- Local factors alter fluid balance, causing inflammation and capillary leakage.
- Resulting fluid is protein- and LDH-rich.
- Light's criteria for exudate differentiation.

Transudative Effusion

Transudative Effusion: systemic conditions

- Systemic factors cause fluid imbalance.
- Fluid tends to have low protein and LDH levels.
- Causes include heart failure, cirrhosis, and hypoalbuminemia.

Light's criteria for exudate differentiation

As a rule of thumb

Exudate has a great amount of **proteins**, LDH or even cholesterol. So, we have Light's criteria for transudate/exudate differentiation, that is, this criteria are used to differentiate between a transudative and exudative effusion. An exudate is defined as the presence of any of the following:

Criteria

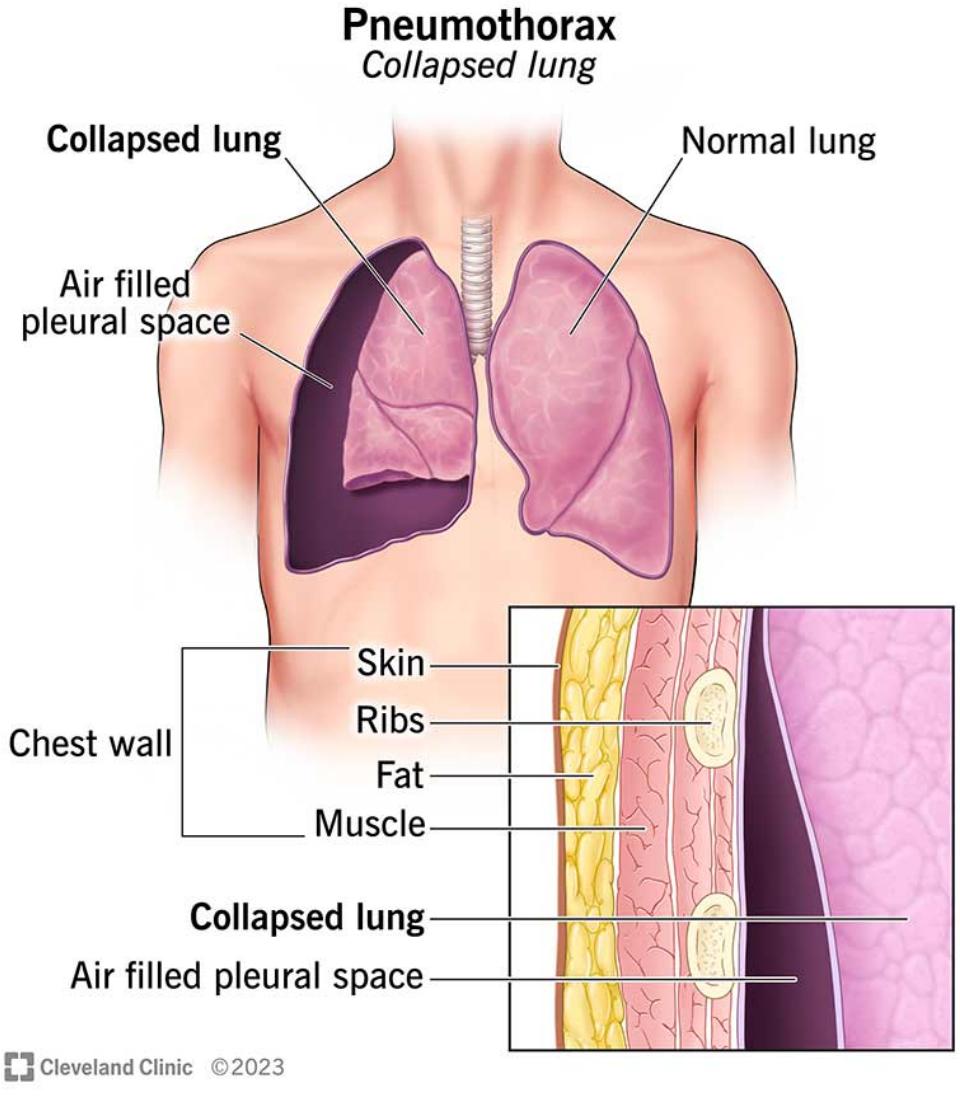
- Pleural protein to serum protein ratio > 0.5
- Pleural lactate dehydrogenase (LDH) to serum LDH ratio > 0.6
- Pleural LDH greater than two-thirds of upper limit of normal for serum.

Pneumothorax

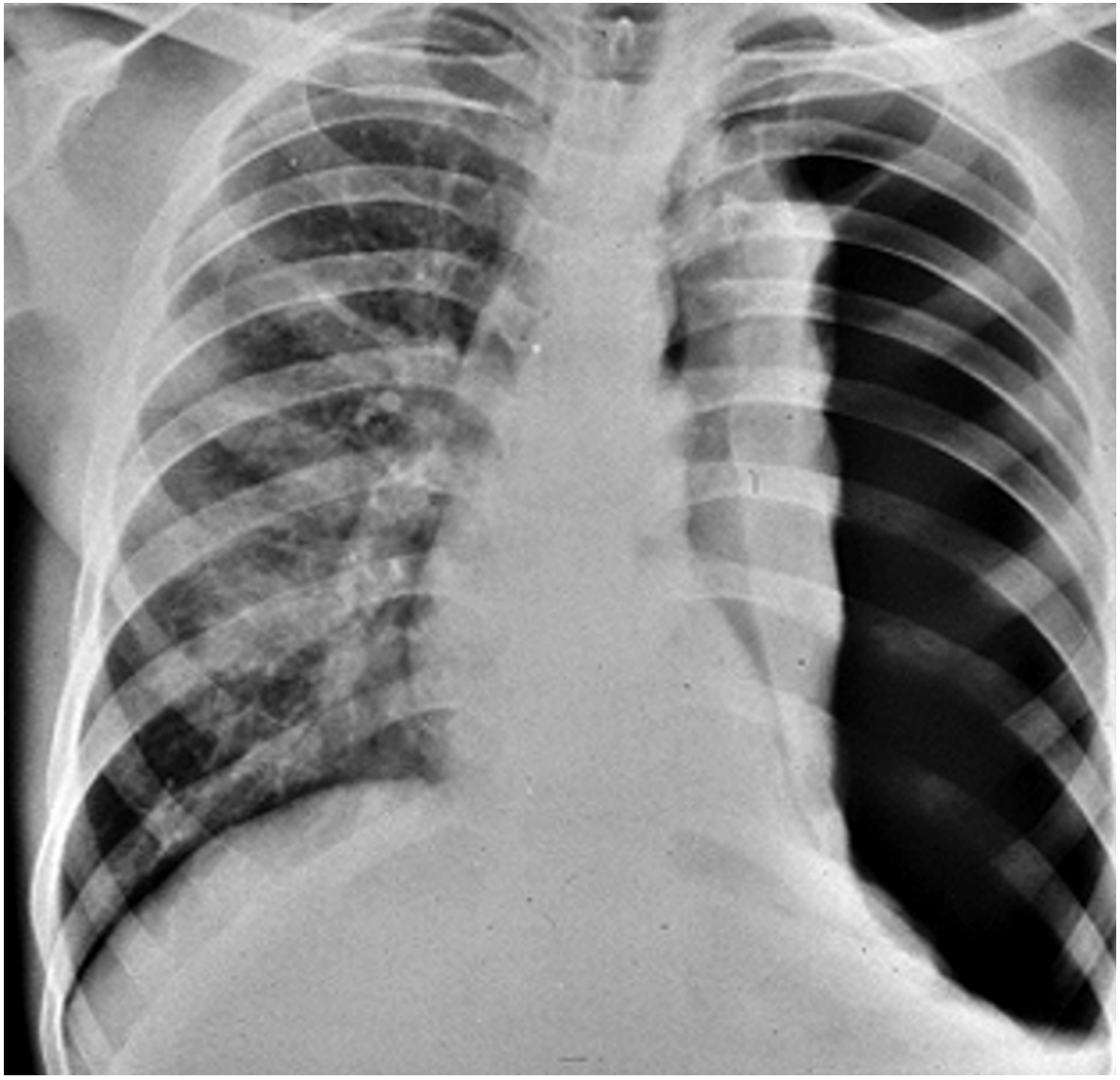
Pneumothorax

- **Gas** within the pleural space.
- Types: primary spontaneous, secondary spontaneous, traumatic, iatrogenic.
- Tension pneumothorax is a medical emergency.

Pneumothorax



Pneumothorax



Pneumothorax

Clinical Presentation

- Pleural effusion symptoms: dyspnea, chest pain.
- Pneumothorax symptoms: dyspnea, chest pain, distress in tension pneumothorax.

Treatment

- Treatment depends on the size/type of pneumothorax.
- Options: observation with oxygen therapy, percutaneous aspiration, chest tube insertion.

Pneumothorax