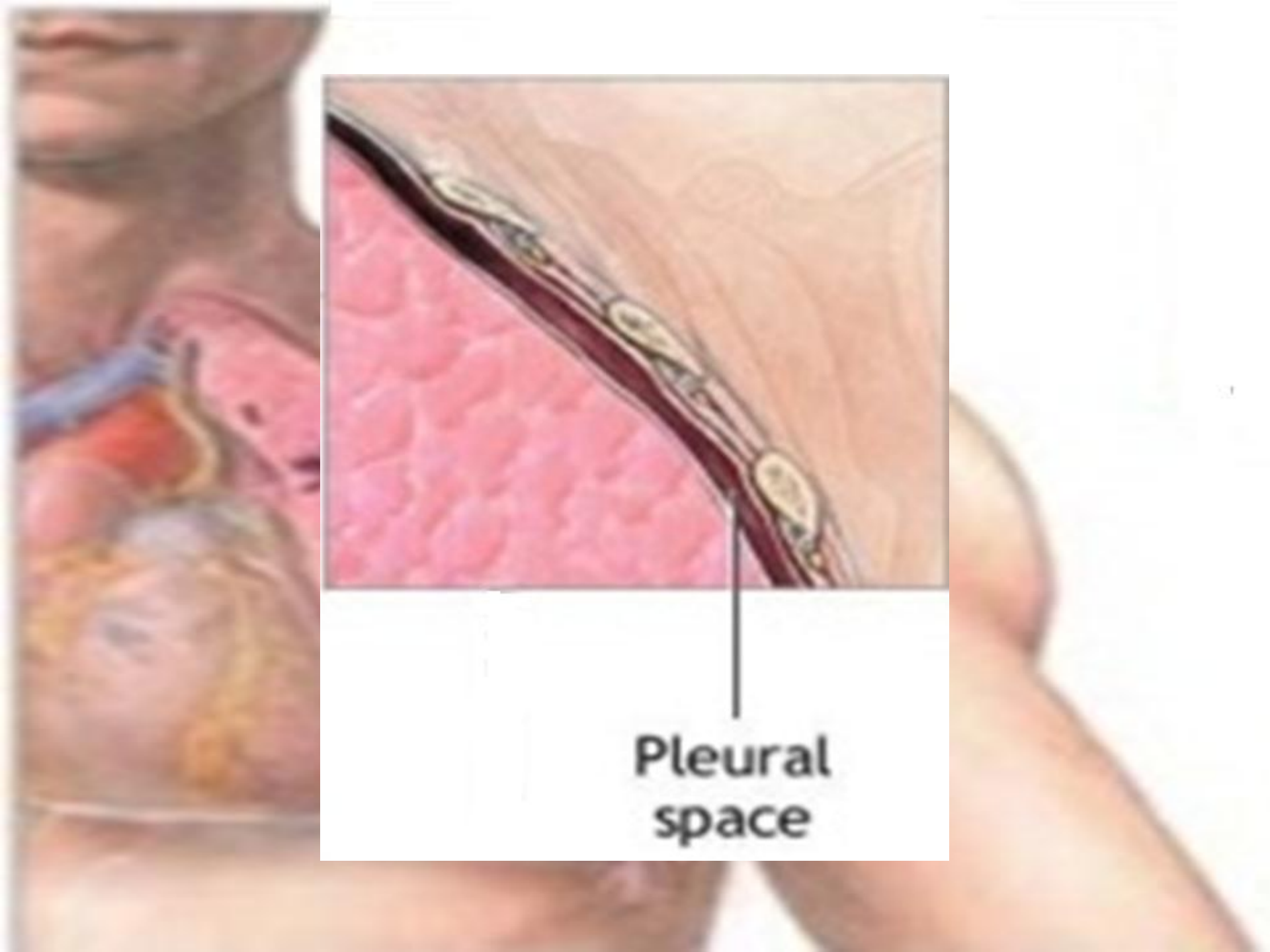
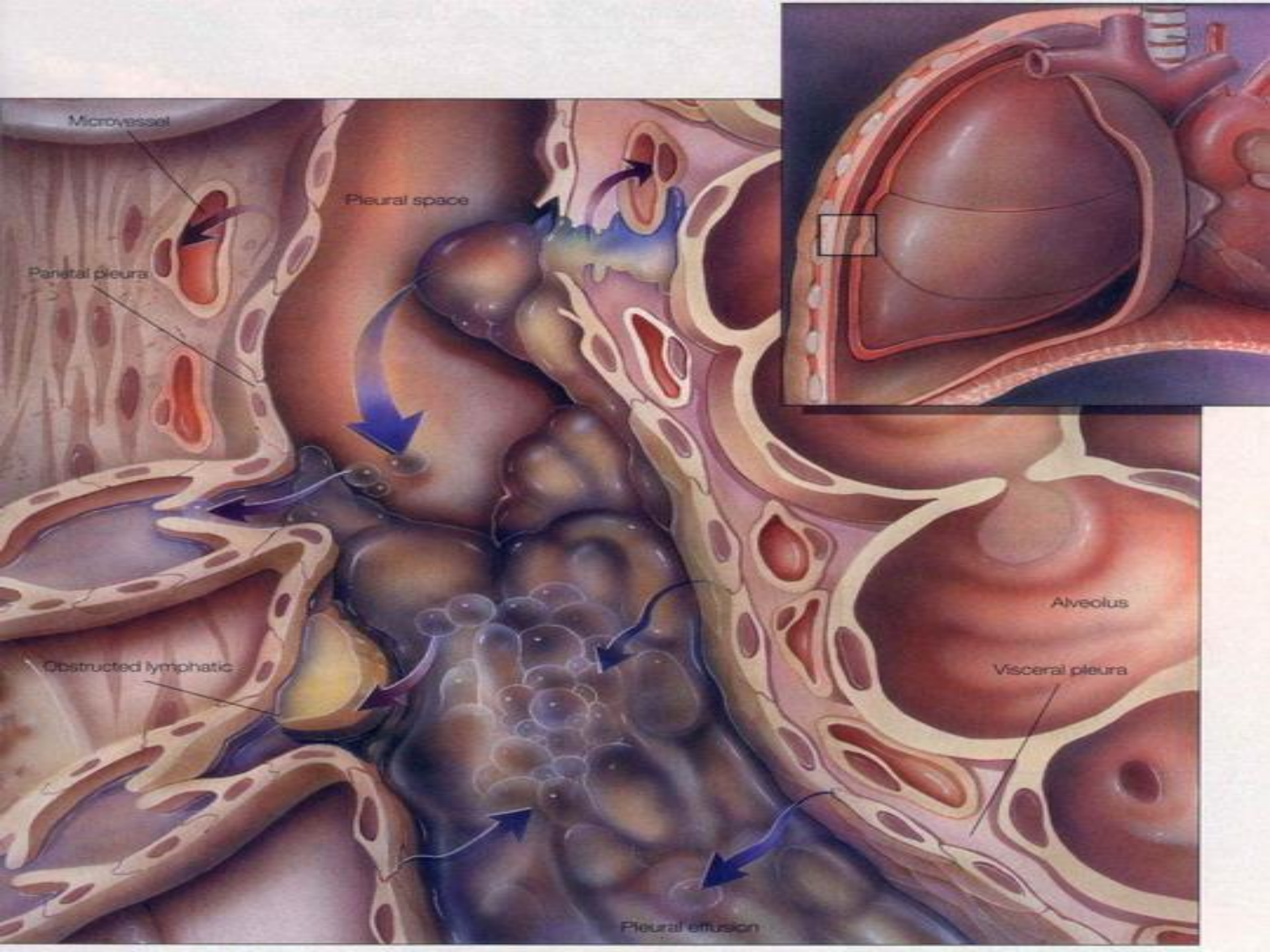
Pleural Diseases

M. G. Hagag


Pleural
space

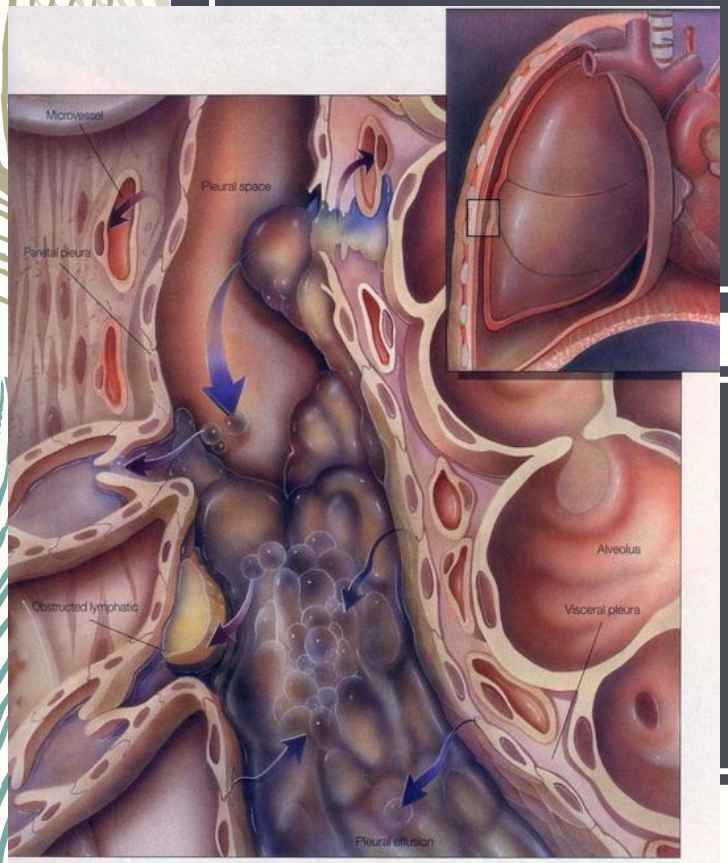

Microvessel
Pleural space
Parietal pleura
Alveolus
Obstructed lymphatic
Visceral pleura
Pleural effusion

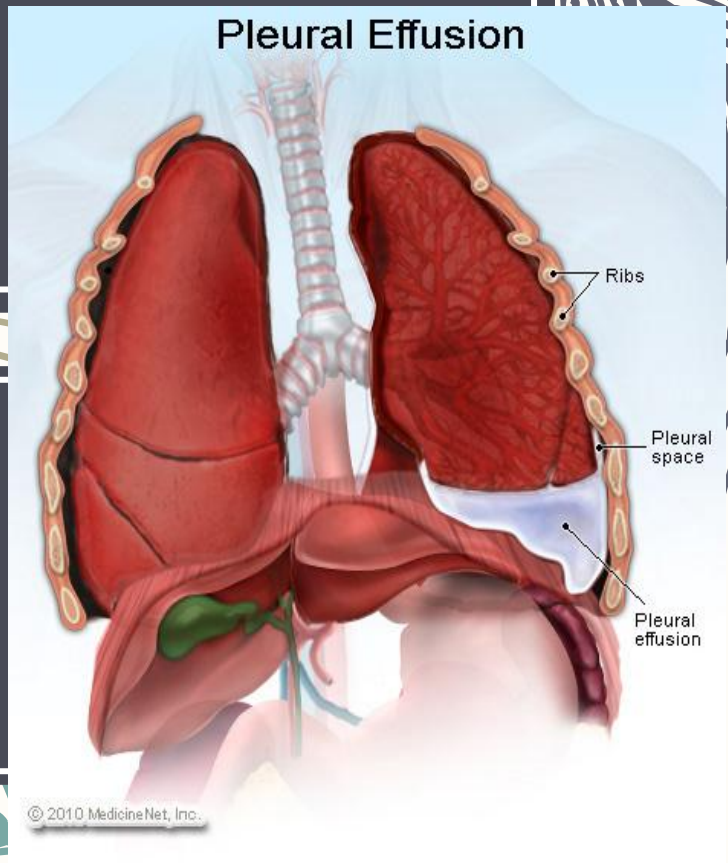
What will we know about?

- ✓ Pleural Effusion
  - ➢ Malignant Pleural Effusion
  - ➢ Empyema Thoracis
- ✓ Pneumothorax

Pleural Effusion

Accumulation of fluid in pleura





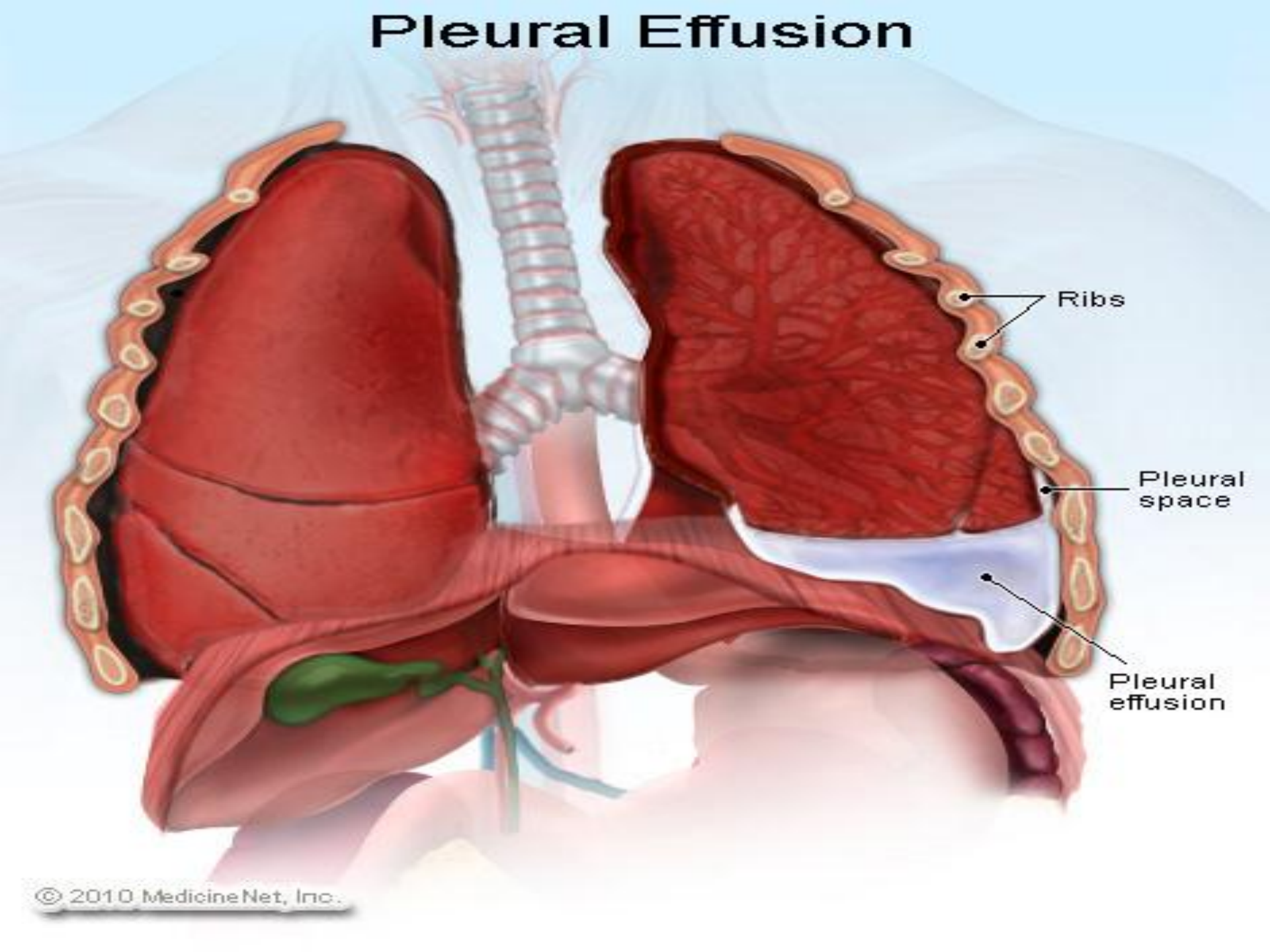
Etiology

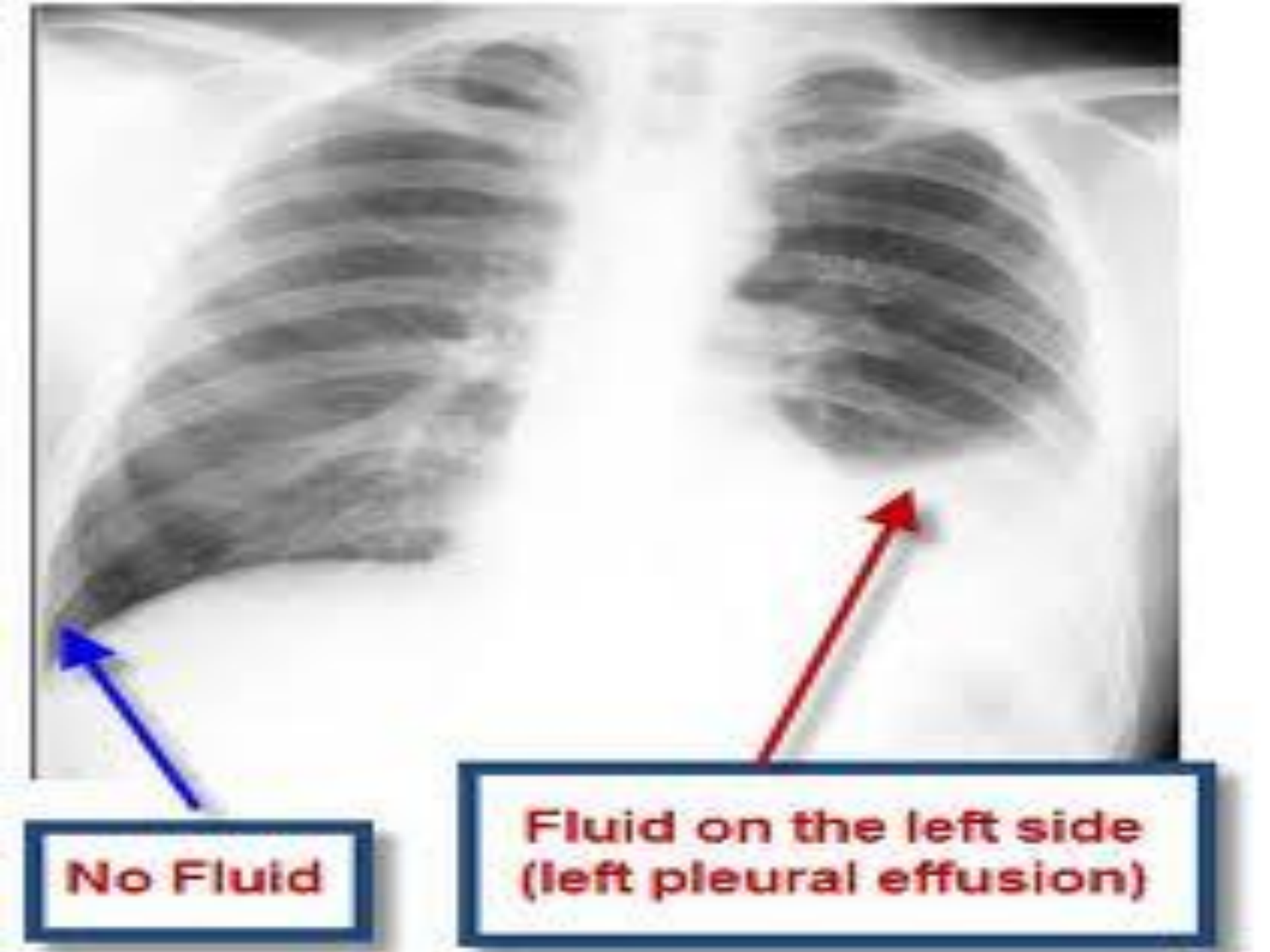
- Hydrothorax:
  - Transudative: heart
    failure and protein losing nephrop
  - Exudative: inflammation, malignancy, and autoimmune disease.
- Hemothorax: trauma
- Chylothorax: thora
  malignancy.
- Pyothorax: infected pleural effusi nd spread from nearby infection.

Exaggeration of normal phenomenon that occurs secondary to primary disease

Primary active pathology of the serous sac with new pathological mechanisms

Pleural Effusion




No Fluid
Fluid on the left side
(left pleural effusion)

- Light's criteria:
  - Pleural protein > 0.5 serum protein
  - Pleural LDH > 0.6 serum LDH
  - Pleural LDH > 2/3 upper normal limit of serum LDH

If all negative

Transudative

VS

If one positive

Exudative

Investigations:

- Chest X-ray:
  - Homogenous opacity
  - Obliterating costo-phrenic angle
  - Upper fluid level rising toward axilla
- Diagnostic aspiration:
  - Physical: color and density
  - Biochemical: constituents (Light's criteria)
  - Culture and sensitivity
  - Cytology
- Ultrasound
- CT chest

Treatment:

- Transudative:
  - Treatment of the cause
  - Medical: diuretics, protein supplementation and symptomatic
  - Drainage by therapeutic thoracocentsis if severely symptomatic
- Exudative:
  - Treatment of etiology
  - Medical: symptomatic
  - Drainage usually by chest intercostal tube (thoracostomy)

Treatment:

- Chylothorax:
  - Conservative treatment (7-14 days) as:
    - Chest tube insertion
    - Nothing per mouse
    - Total parenteral nutrition
- Hemothorax:
  - Chest tube insertion
- Pyothorax:
  - Chest tube insertion
  - Antibiotics

TRINSIC
ANIMATION

Malignant effusion

- ✓ **When to suspect?**
  - History of malignancy
  - History suggestive malignancy: rapid loss of weight, unexplained pain, hemoptysis
  - Rapid progression or recurrence of symptoms: cough, chest pain, or dyspnea

Malignant effusion

- Chest X-ray
- Diagnostic aspiration:
  - Physical examination: Haemothorax or serosanginous fluid
  - Chemical Examination: Exudative effusion: positive Light's criteria
  - Cytological examination: It's possible in up to 80% in 3 successive samples to detect malignant cells and its type

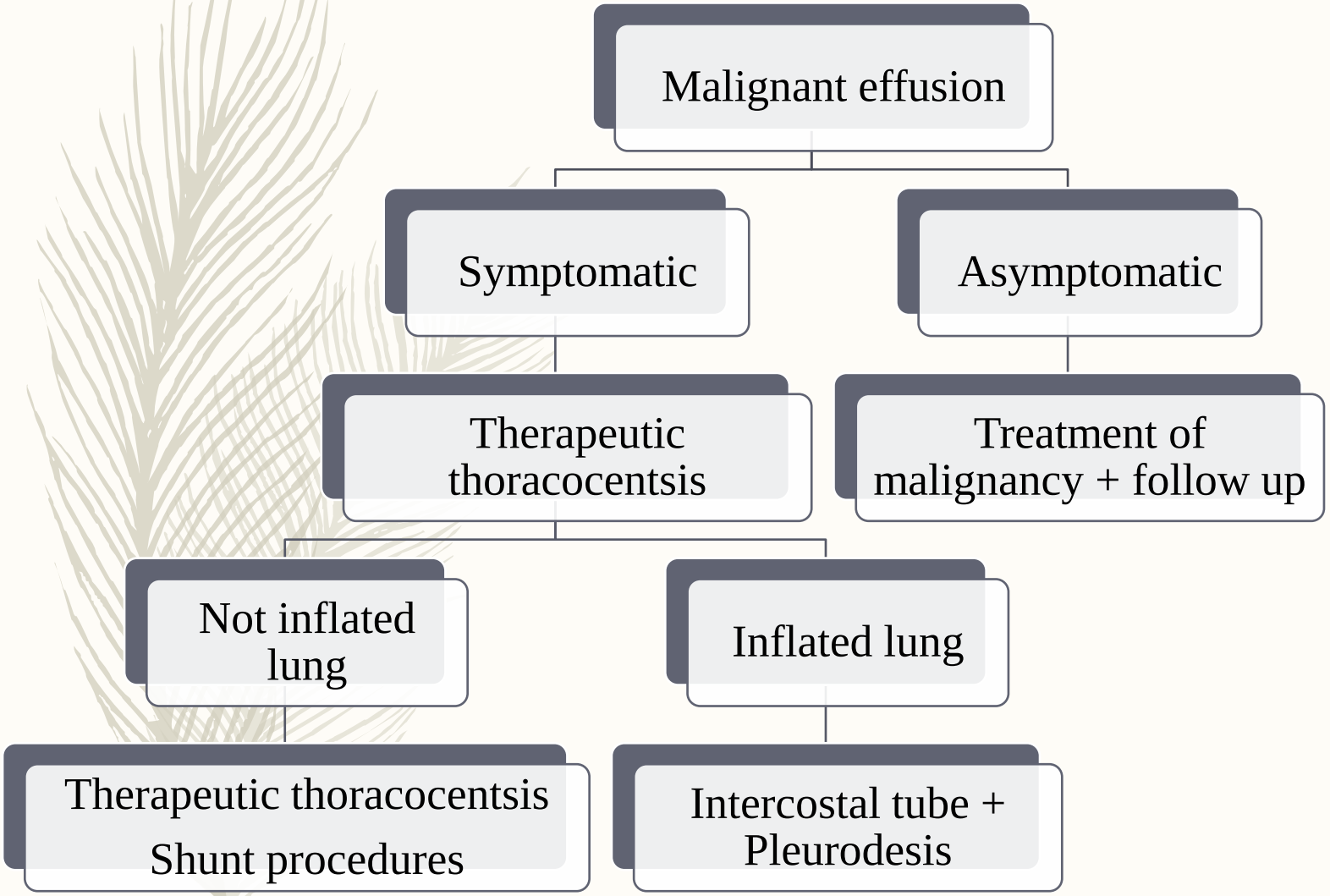
Malignant effusion

- Ultrasonography: to help aspiration of sample
- CT chest: to exclude mesothelioma, bronchogenic carcinoma, lymph nodes
- Investigations to detect primary tumor

Malignant effusion

- Treatment of primary tumor
- Medical treatment:
  - Symptomatic treatment: anti-tussives, analgesics

Malignant effusion



Malignant effusion

Pleurodesis

- Definition: Fusion between visceral and parietal pleura.
- Types:
  - Mechanical: intraoperative or thoracoscopic
  - Chemical: by injecting sclerosing agent into chest tube as: Talc powder, Tetracycline, Blood, Betadine, Bleomycin, Viscum

Empyema Thoracis

Definition

- ✓Accumulation of Pus in the Pleural cavity.
- ✓It comes from the Greek word empyein, which means: pus – producing (suppurates).

Empyema Thoracis

Etiology

- Lung diseases:
  - Pneumonia (the most common cause)
  - Lung abscess
- Sub phrenic abscess
- Post traumatic
- Iatrogenic
- Post-operative
- Blood spread

Empyema Thoracis

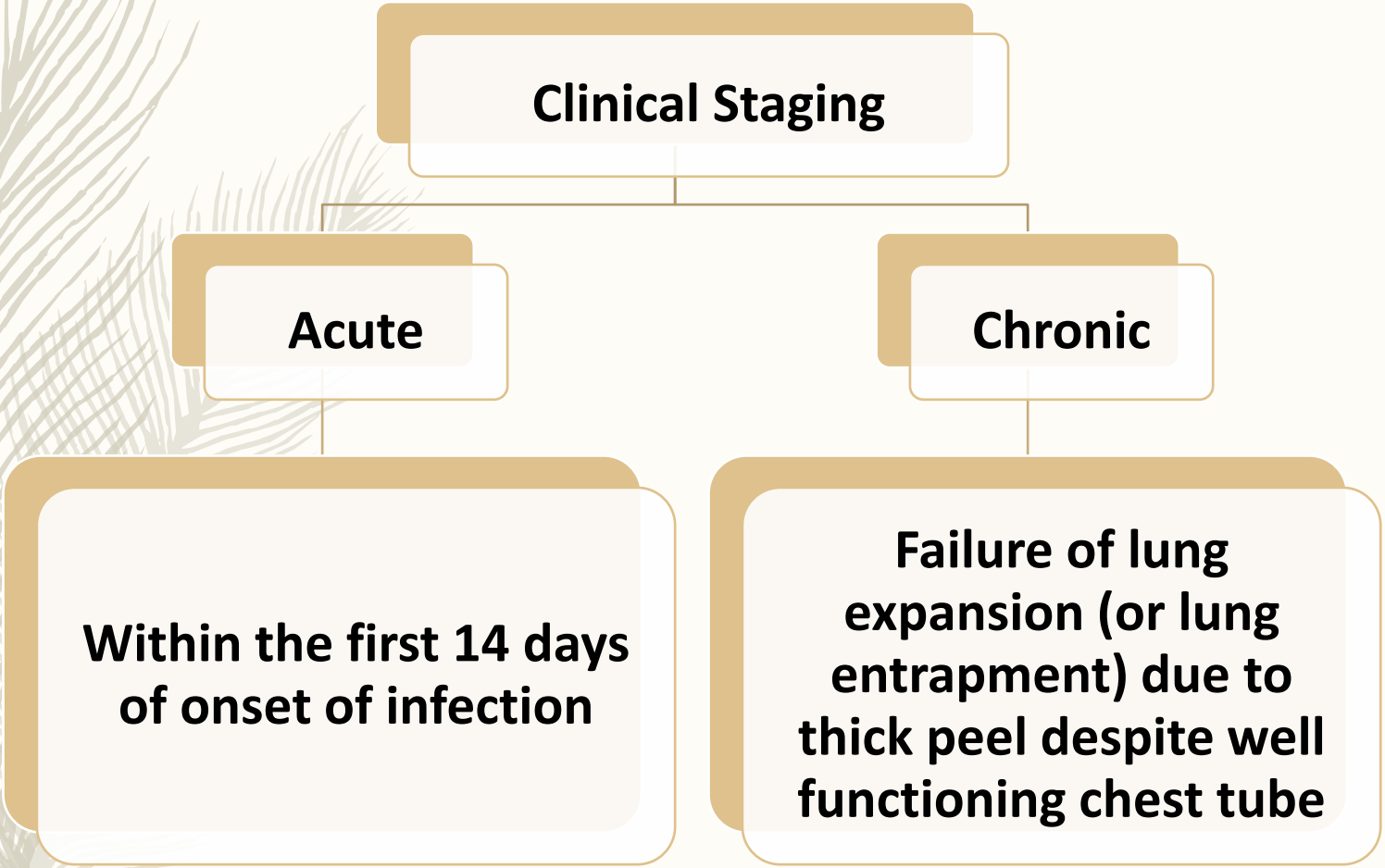
Etiology

The most common:

- Staph. aureus (90% of causes in infants & children)
- Strept. pneuomonie
- H. influenzae

Empyema Thoracis

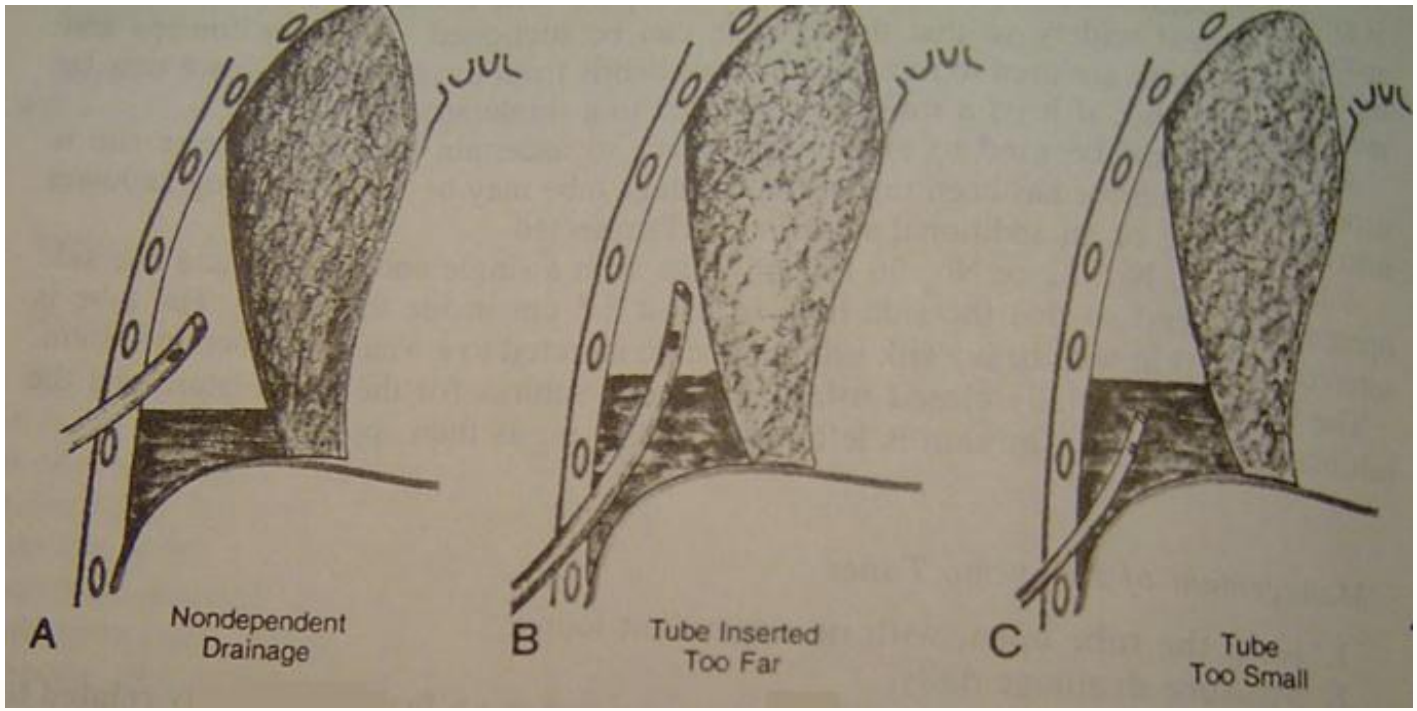
Stages



Empyema Thoracis

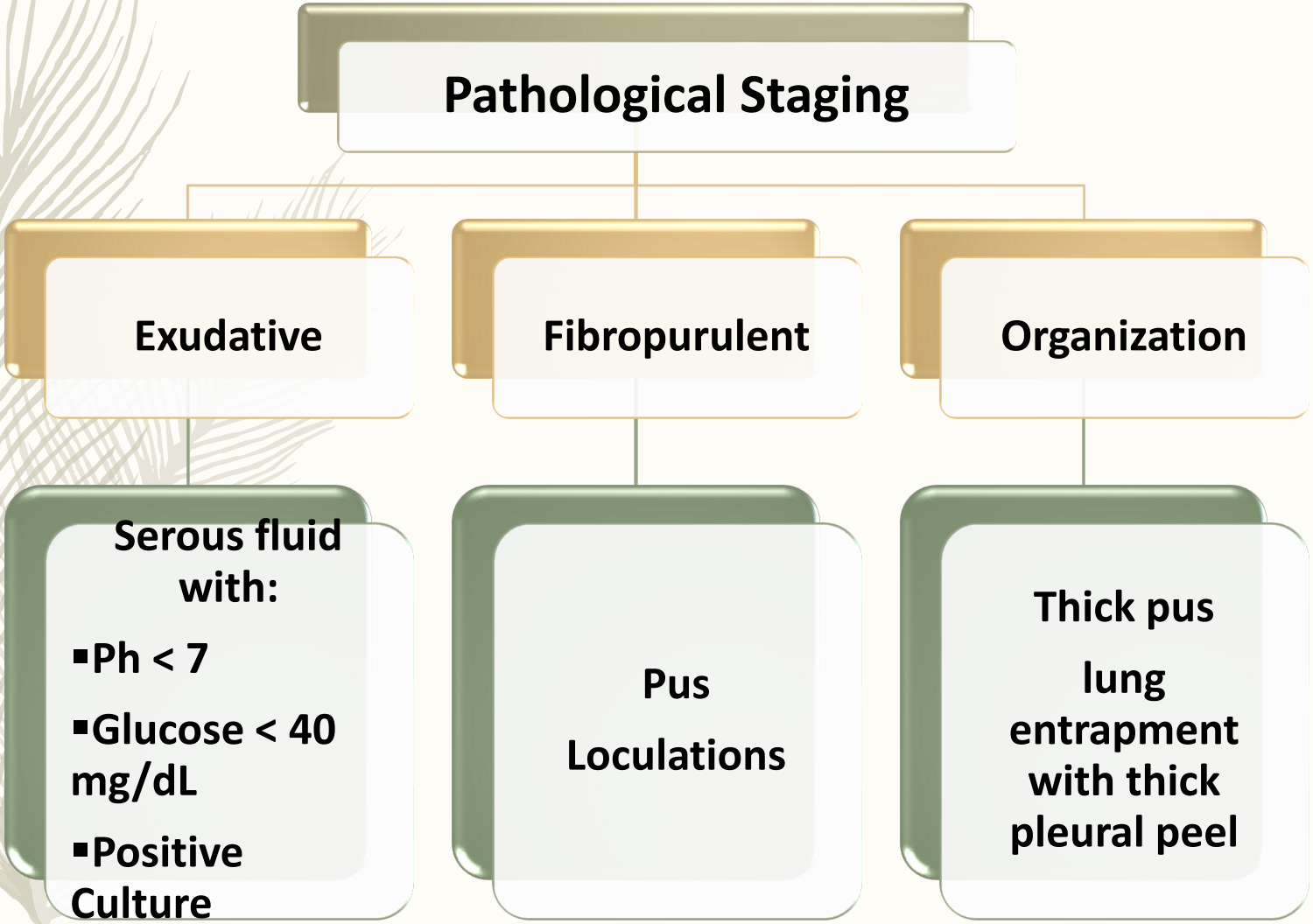
Stages

- **Causes of chronicity:**
  - Inadequate Tube Drainage.



Empyema Thoracis

Stages



Empyema Thoracis

Complications

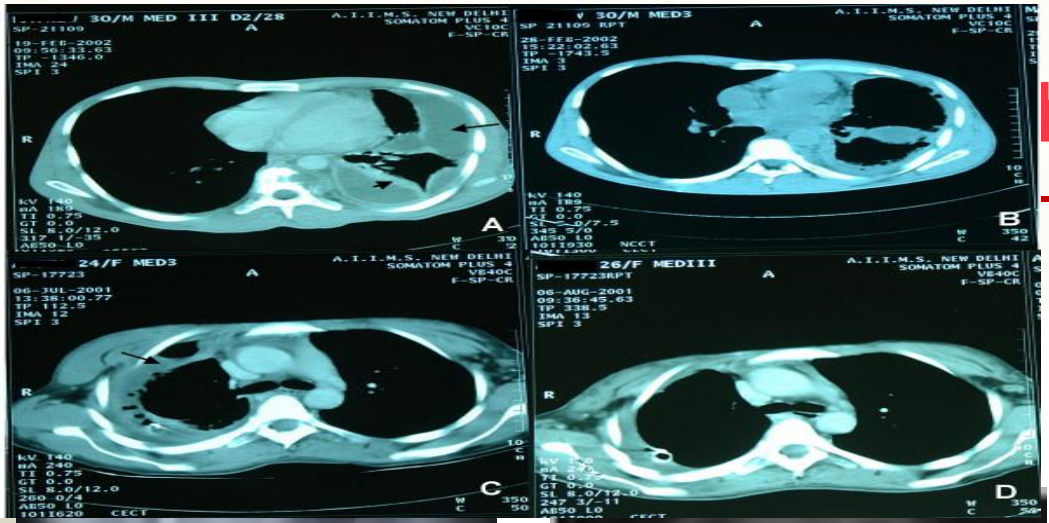
- Rupture into the lung:
  - Bronchopleural fistula
- Spread to the subcutaneous tissue:
  - Empyema Necessitans
- Septicemia & septic shock

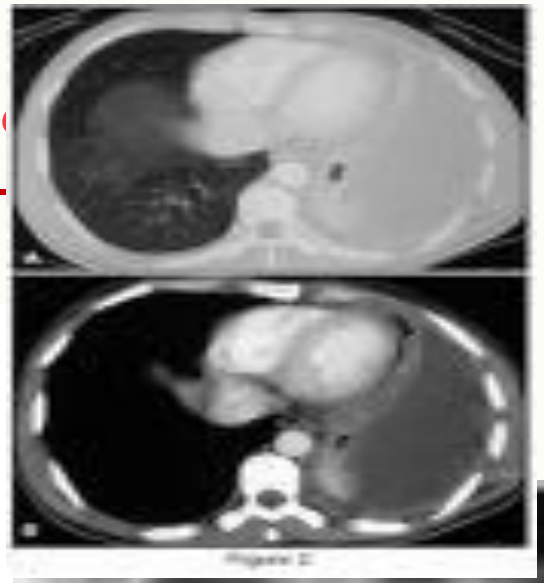
Empyema Thoracis

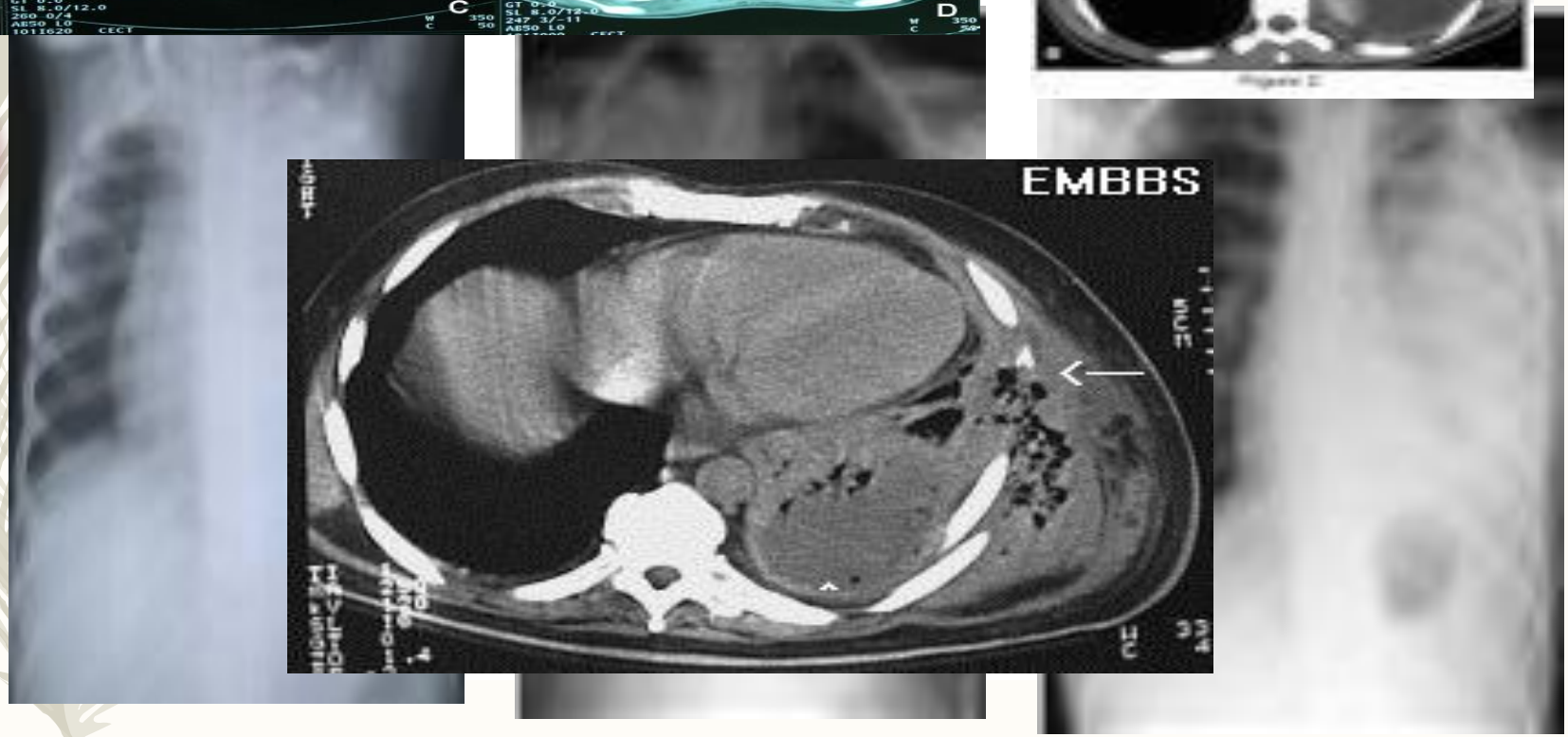
Clinical Picture

- Fever
- Headache
- Anorexia
- Malaise
- Cough
- Pleuritic chest pain
- Dyspnea

Investigations







Empyema Thoracis

Investigations

- Chest X-ray
- CT scan
- Ultrasonography
- Thoracentesis: Don’t forget culture & sensitivity of aspirate

Empyema Thoracis

Treatment

➢**Goals of treatment:**

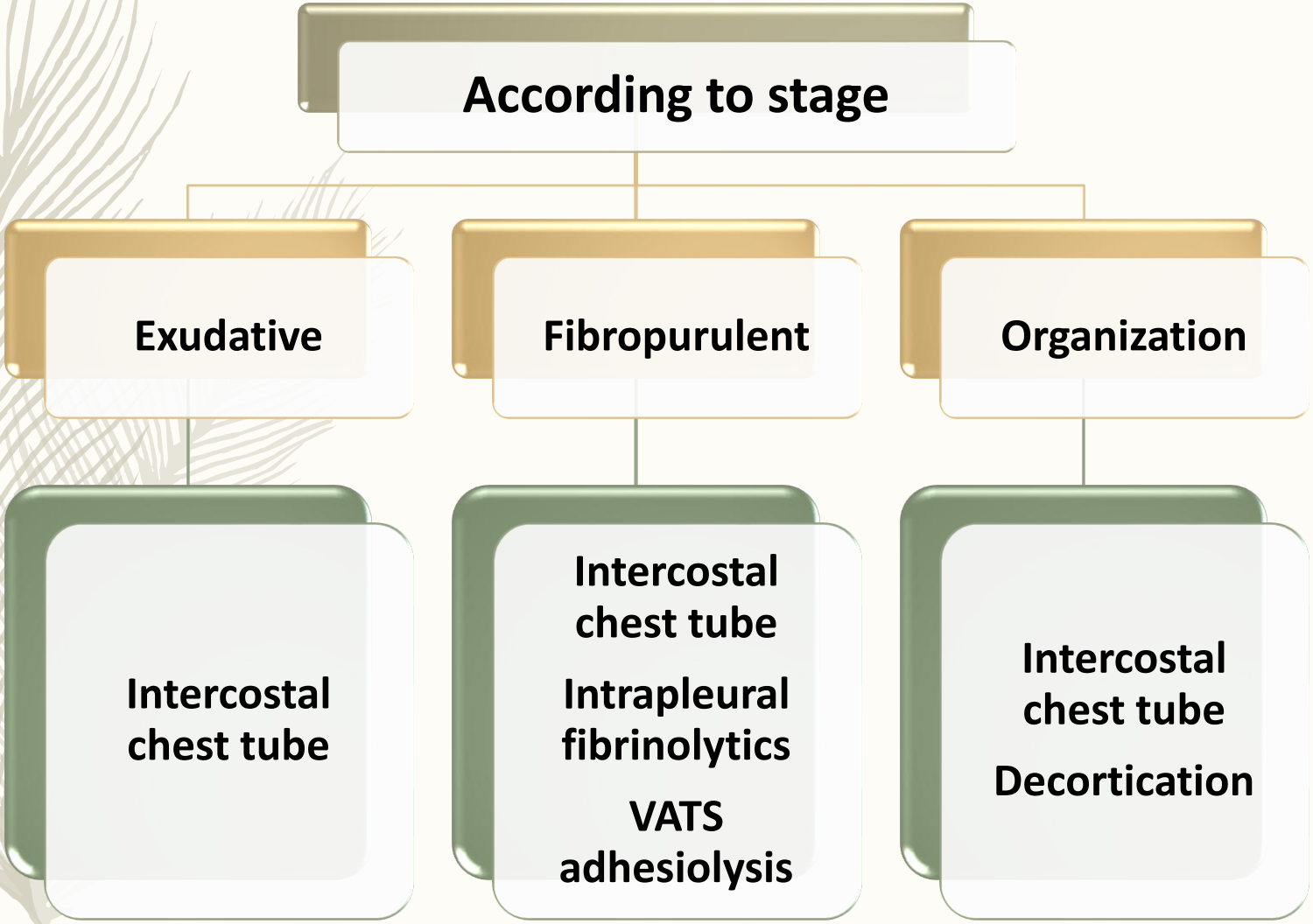
– Control of the Infection process.

– Drainage of pus form the pleura.

– Obliteration of the space & complete Re-expansion of the Lung.

Empyema Thoracis

Treatment



Take Home Messages:

- Pleural effusion is a common disease, as a doctor you will face in many specialties
- Most important in diagnosis is type and not only pleural effusion
- When clinical picture is not conclusive, select the simple and more diagnostic investigation

Take Home Messages:

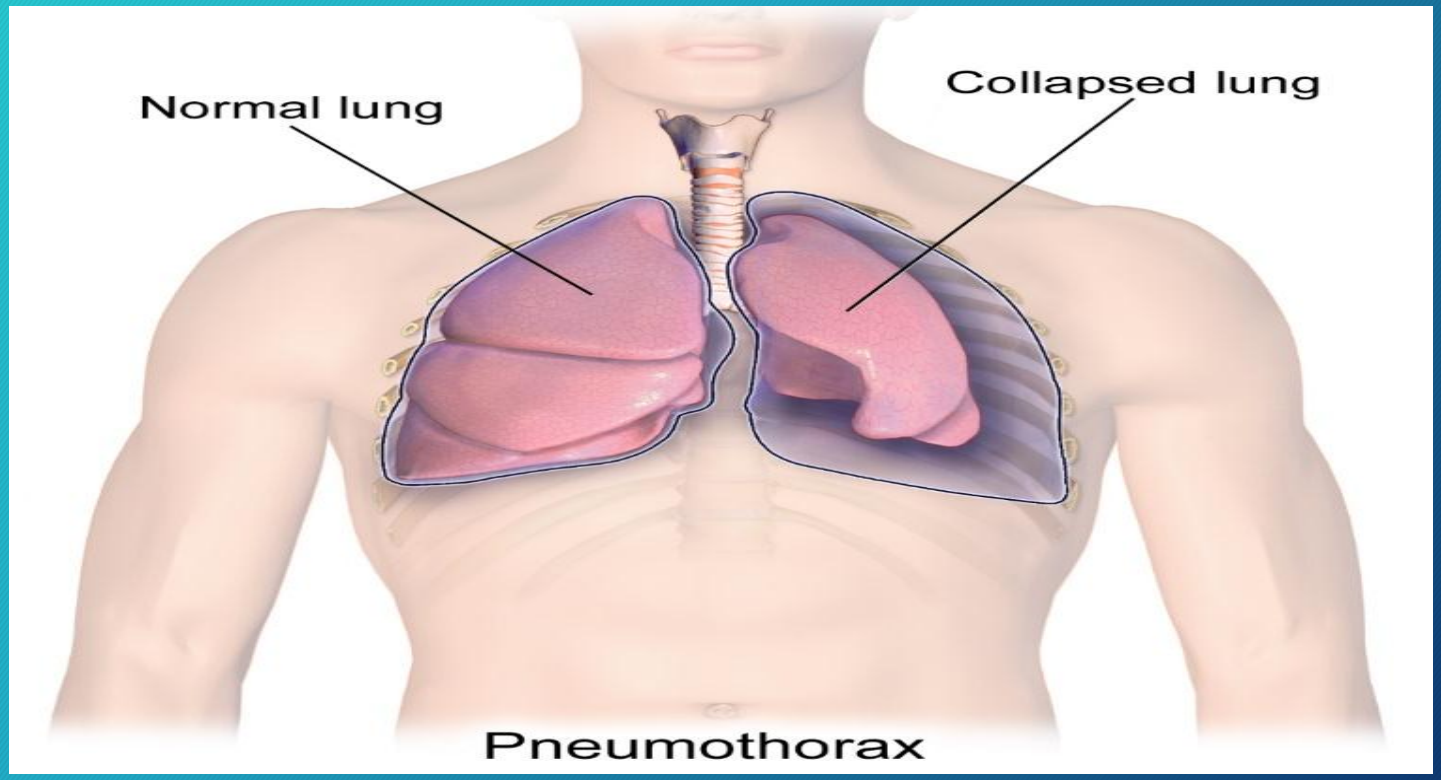
- Don’t rush for chest tube insertion except if you are sure that pleura is filled with pus, blood or chyle
- Malignancy doesn’t have any sense without tissue diagnosis

Take Home Messages:

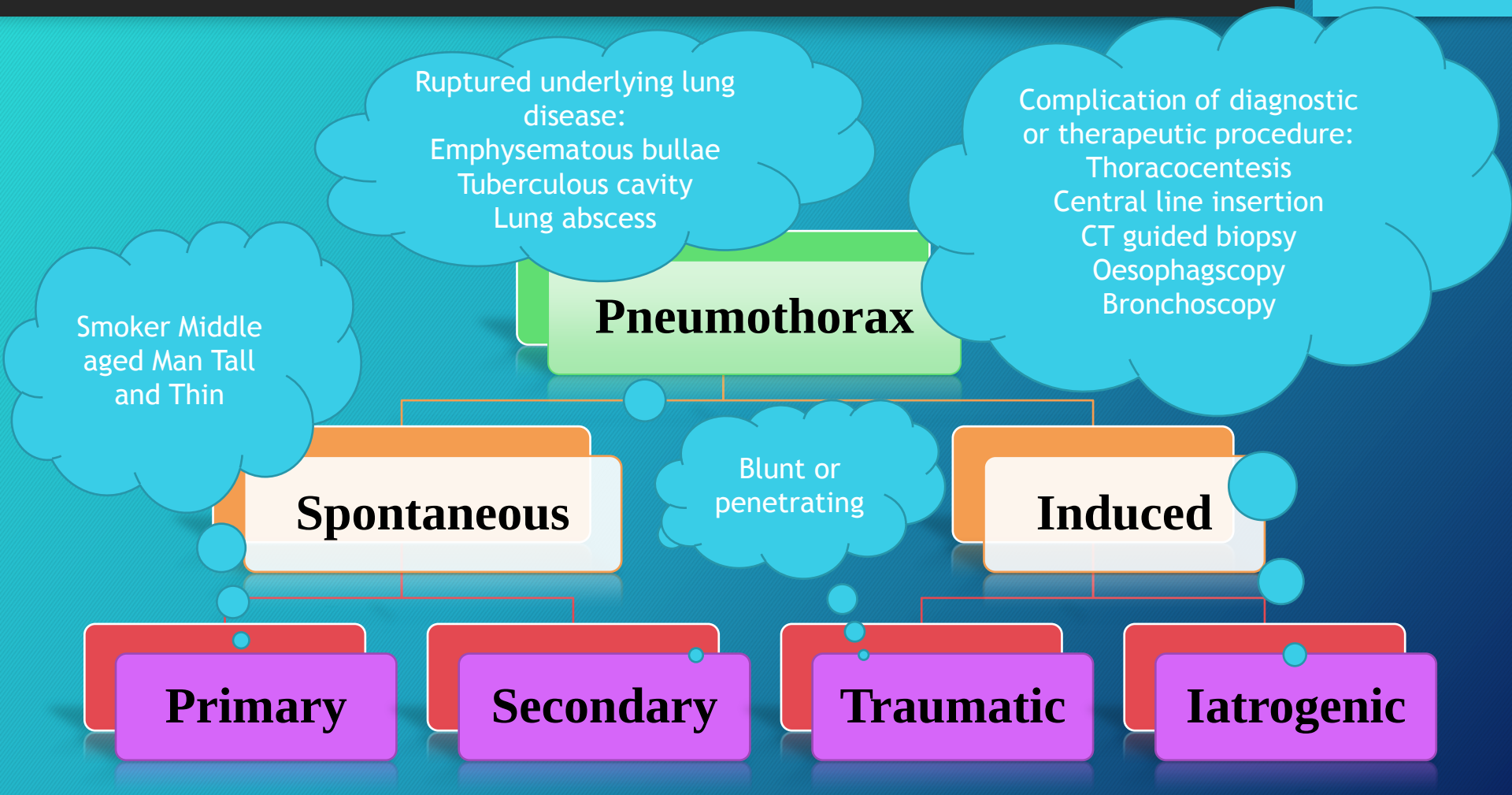
- In Empyema please:
  - ✓ Don’t forget culture for aspirate
  - ✓ Drain pus
  - ✓ Ensure good lung expansion

Pneumothorax

Presence of air or gas in pleural space



Types and Etiology



Clinical picture

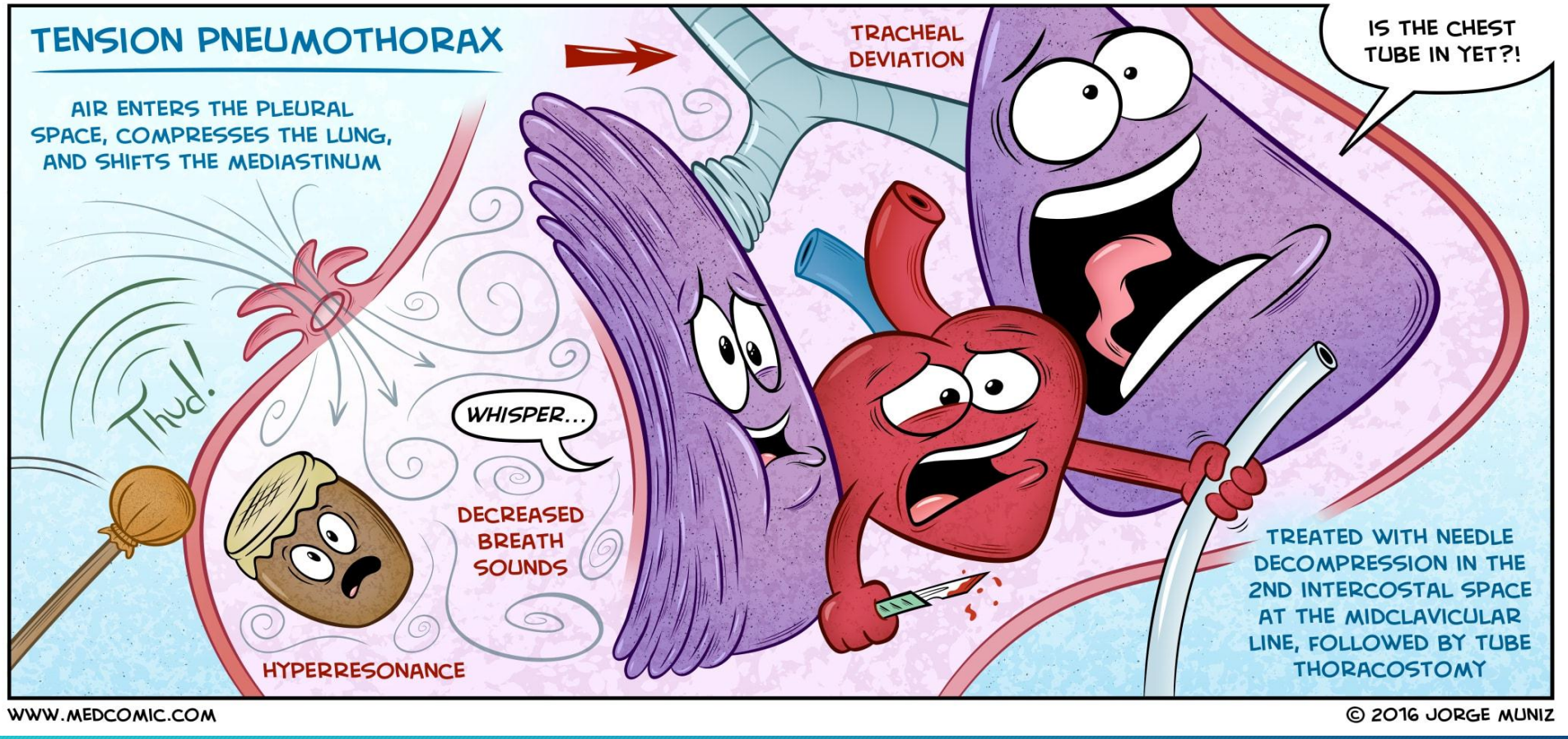
- ***Symptoms:***

Chest pain: Sharp acute severe stabbing, radiates to the ipsilateral shoulder and increases with inspiration.

Shortness of breath: following pain very soon

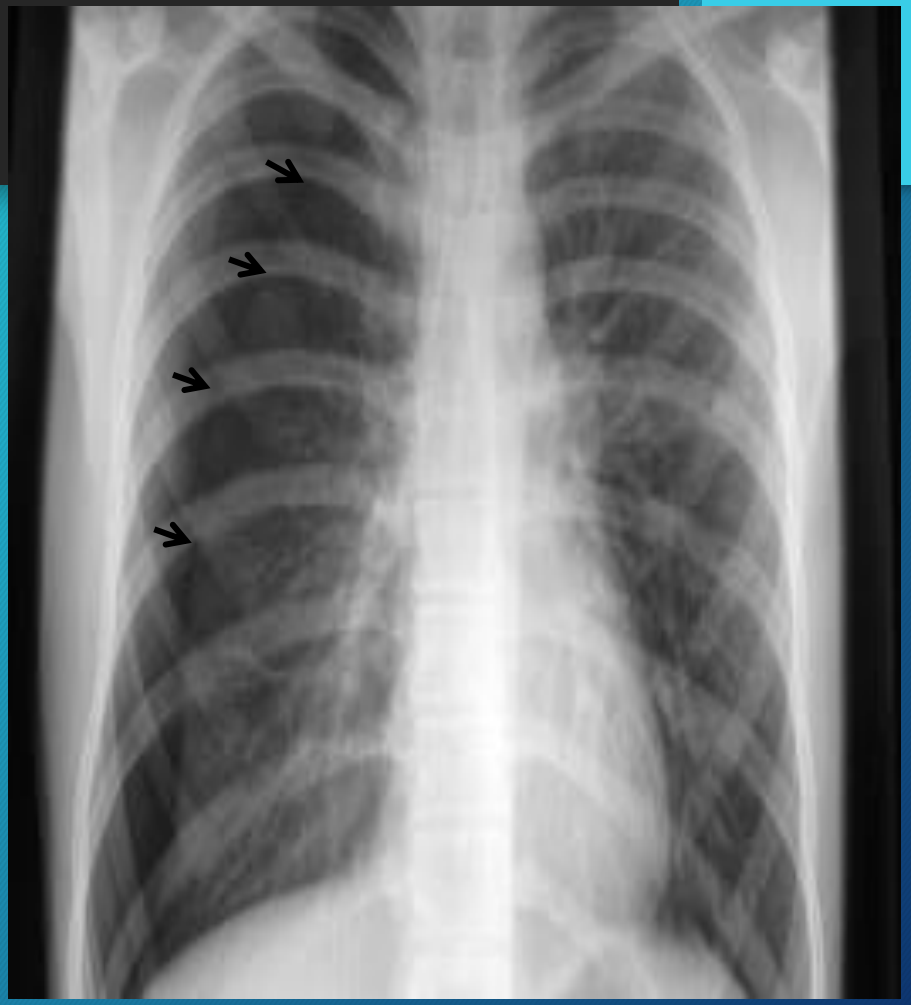
Clinical picture

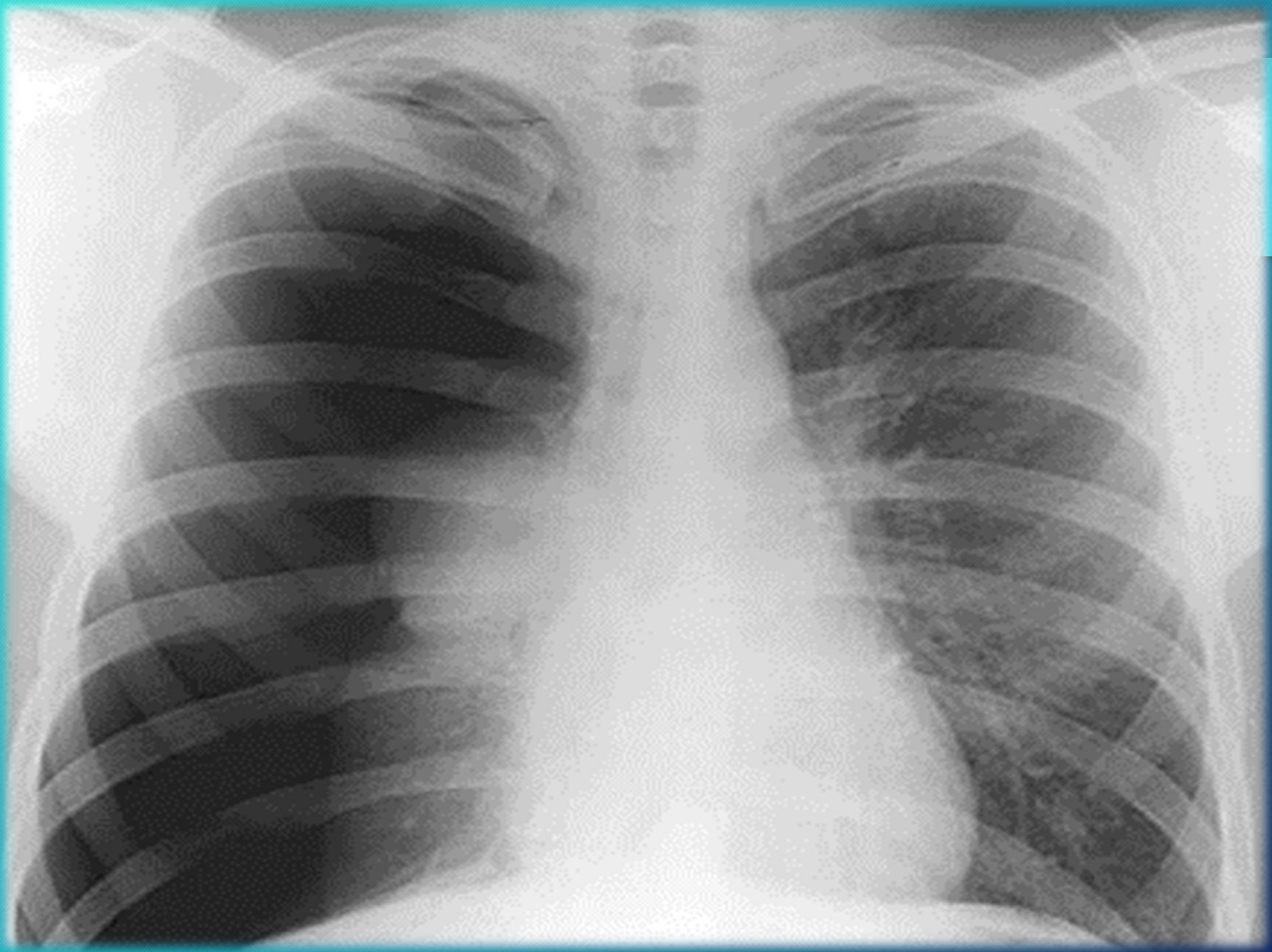
- ***Signs:***
  - ***Tachypnea***
  - ***Asymmetric lung expansion***
  - ***A mediastinal and tracheal shift to the contralateral side***
  - ***Hyperresonance on percussion***
  - ***Decreased or absent air entry on the affected side***



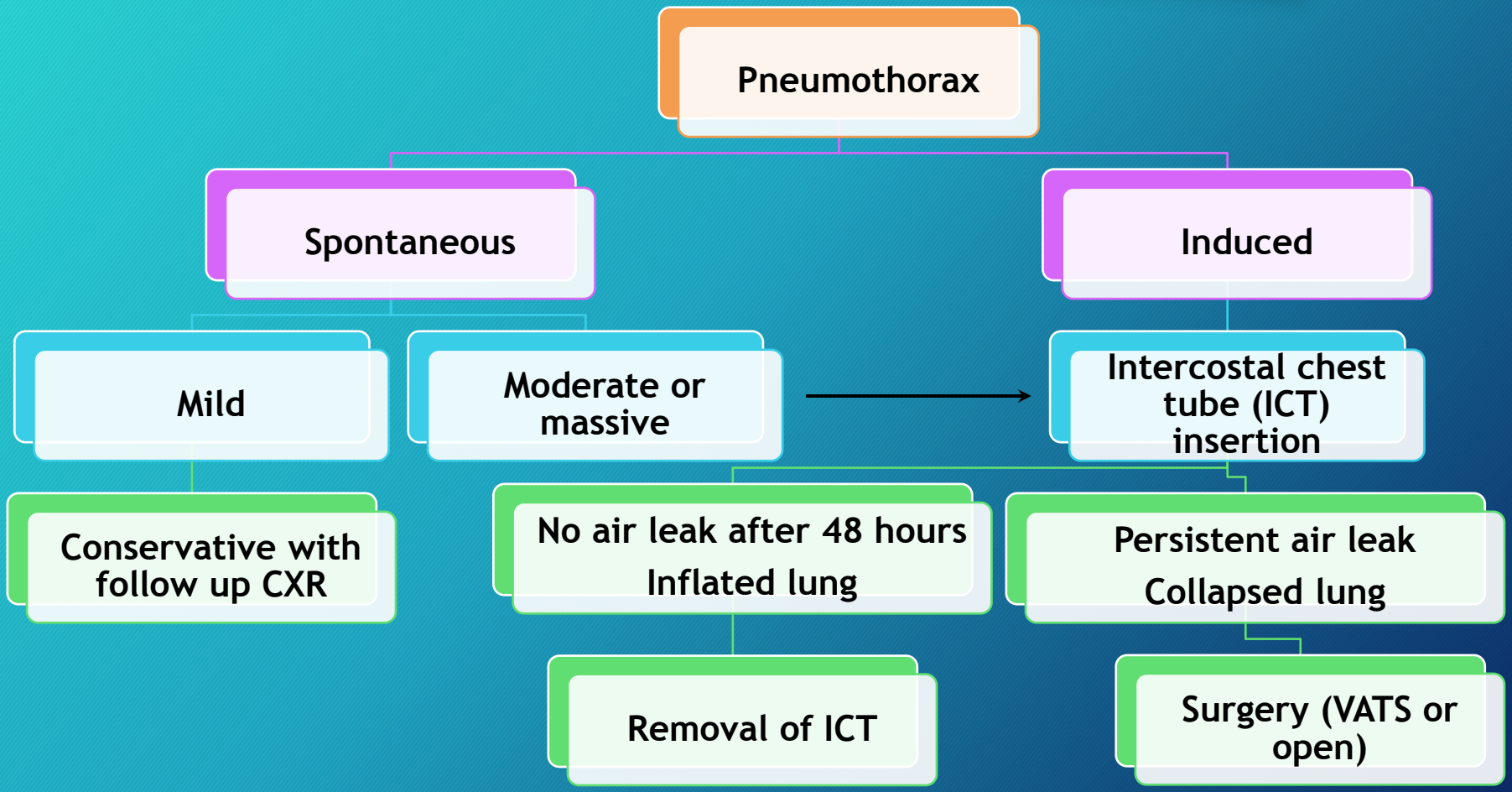
displacing mediastinal structures and **compromising cardiopulmonary function**.

Investigations





Treatment


Pneumothorax
Spontaneous
Induced
Mild
Moderate or massive
Intercostal chest tube (ICT) insertion
Conservative with follow up CXR
No air leak after 48 hours
Inflated lung
Persistent air leak
Collapsed lung
Removal of ICT
Surgery (VATS or open)

Treatment

Indications of surgery

- ✓ Non-inflated lung
- ✓ Persistent air leak
- ✓ Major air way injury
- ✓ Exploration thoracotomy for another indication rather than pneumothorax
- ✓ Prevention of recurrence in primary spontaneous pneumothorax

Treatment

Surgical options either done by VATS or open

1. Closure of bronchopleural fistula
2. Non anatomical resection (apical blebs)
3. Anatomical resection (segmentectomy, lobectomy, pneumonectomy)
4. Apical pleurectomy
5. Pleural tent
6. Mechanical pleurodesis


CTV


Thank
You