OBSTURCTIVE LUNG DISEASE

OBSTRUCTIVE PULMONARY DISEASES

COPD

- CHRONIC BRONCHITIS
- EMPHYSEMA

OTHER OBSTRUCTIVE DISEASES

- ASTHMA
- BRONCHIECTASIS
- CYSTIC FIBROSIS

COPD

- COPD is a preventable and treatable disease with some extra pulmonary effects that may contribute to the severity in individual patients.
- It is a disease state characterised by airflow limitation that is not fully reversible.
- The airflow limitation is both progressive and associated with an abnormal inflammatory response to noxious stimuli.

WHAT CAUSES COPD ?

RISK FACTORS

HOST FACTORS

- Hyperactivity of airways .
- Overall lung growth.
- Genetics – alpha-1 antitrypsin deficiency.

    - inflammatory mediated genes.

ENVIRONMENTAL FACTORS

- Tobacco smoke
- dusts and chemicals.
- Indoor air pollutants.
- Outdoor air pollutants.

PATHOPHYSIOLOGY

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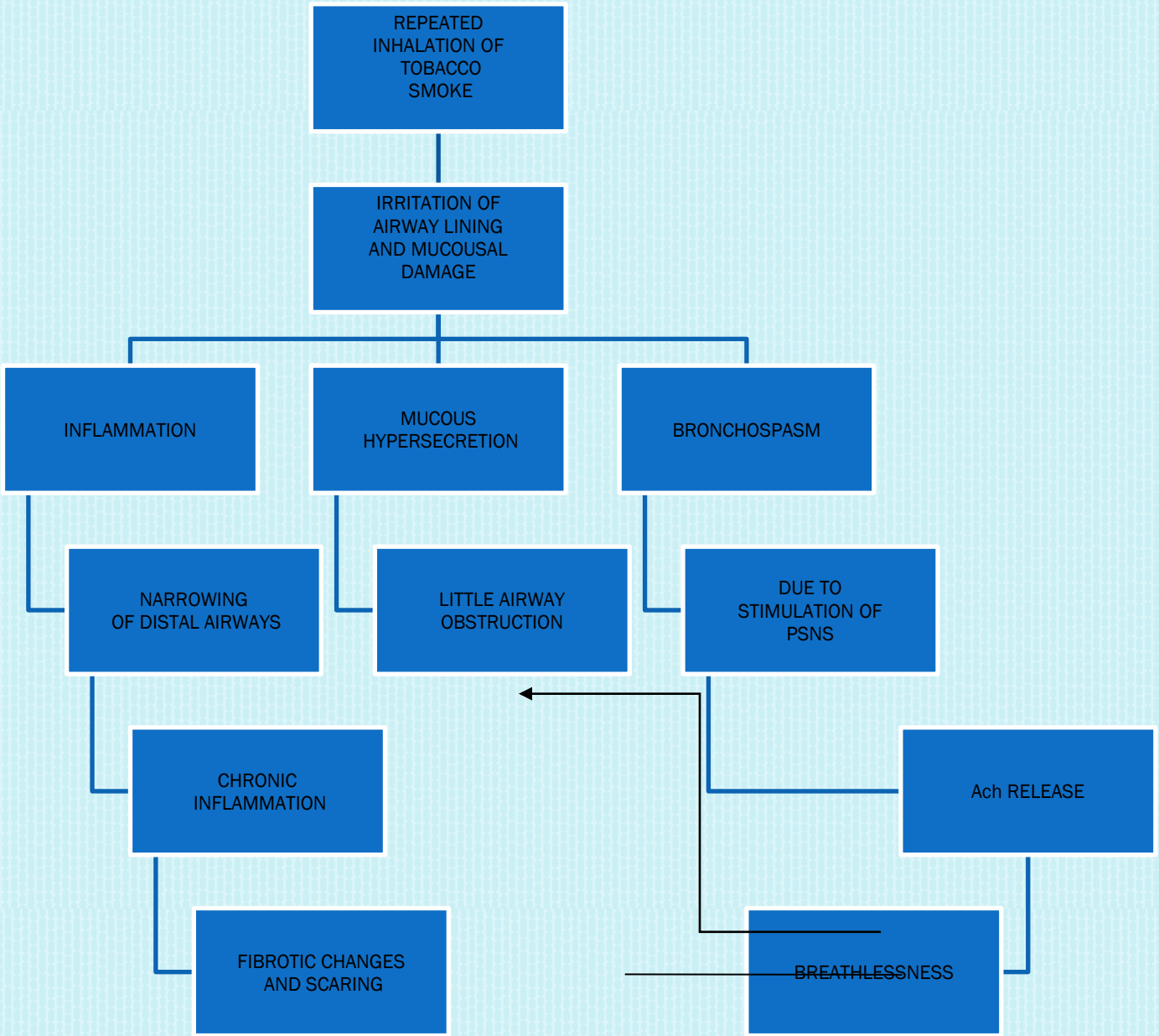
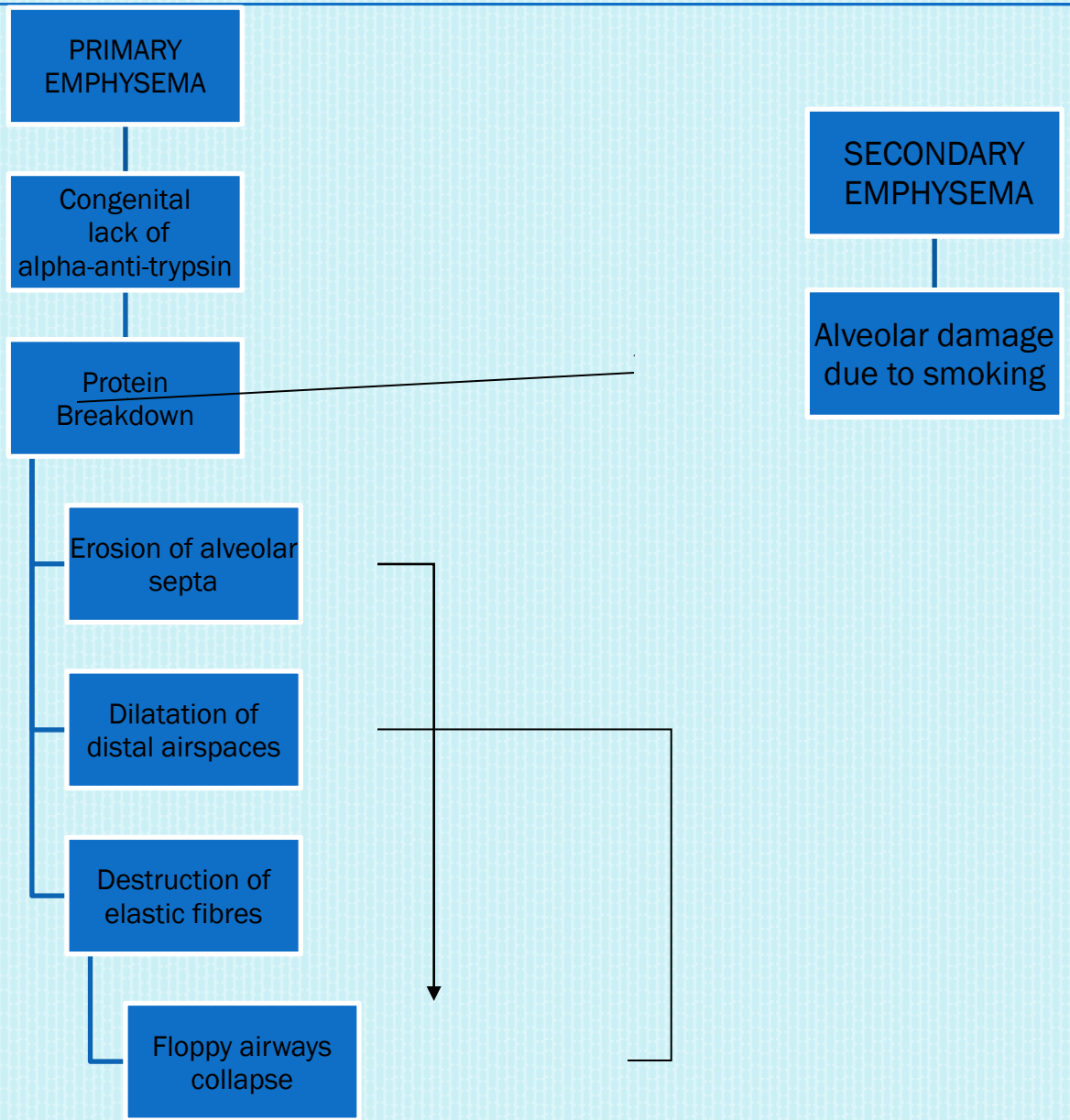
- Emphysema or destruction of gas exchange surface of lung(alveoli) is a pathological term that is often used clinically.
- Chronic bronchitis or the presence of cough & sputum production for at least 3 months in each of two consecutive years, remains a clinically & epidemiological useful term.

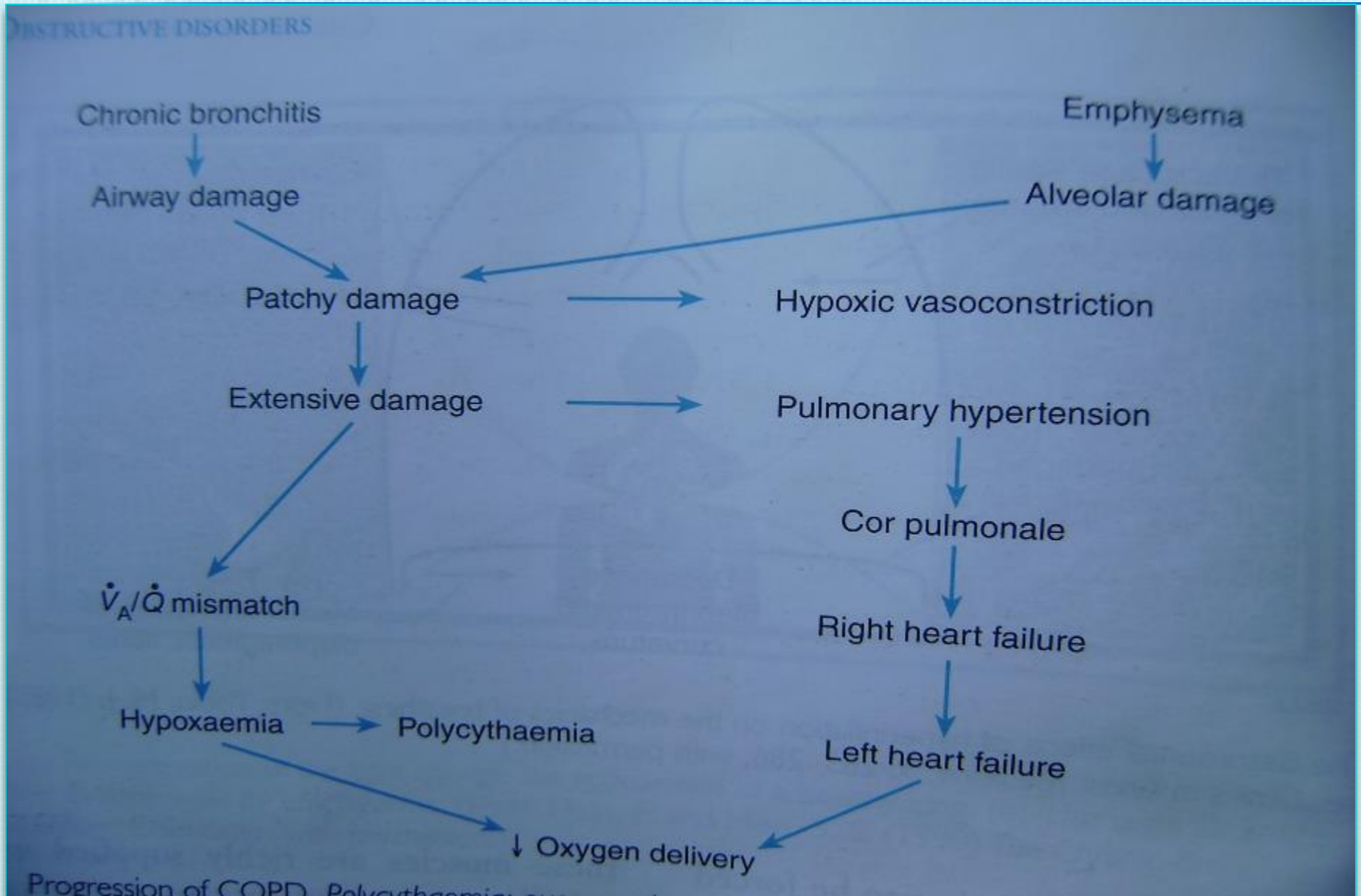
CHRONIC BRONCHITIS



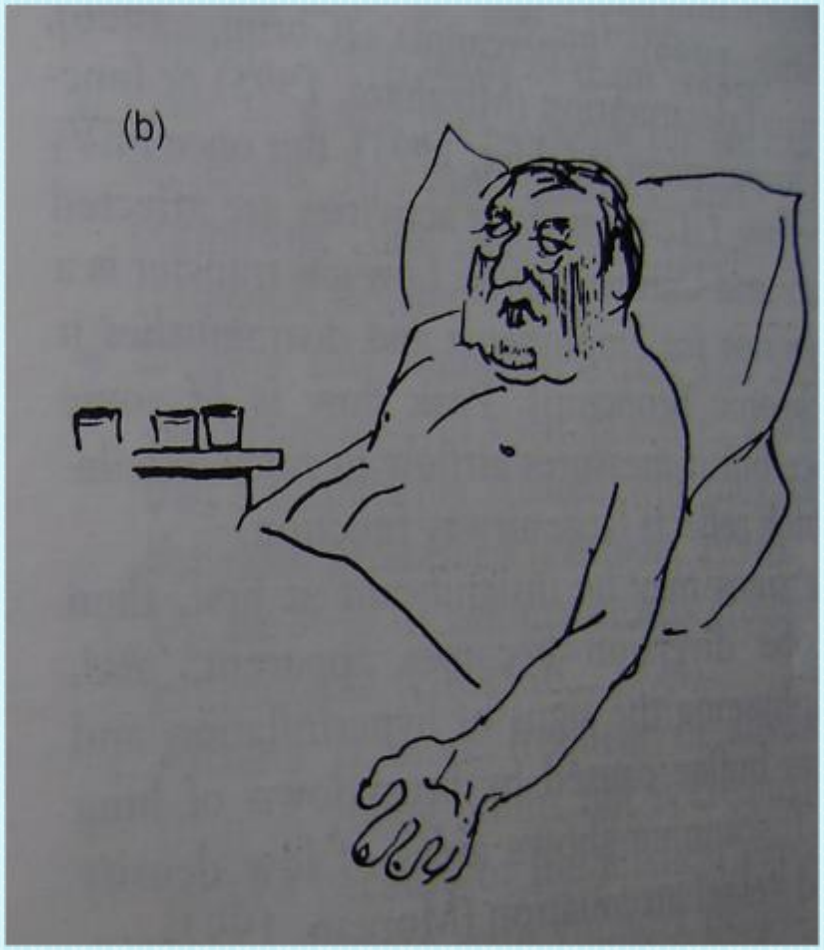
EMPHYSEMA

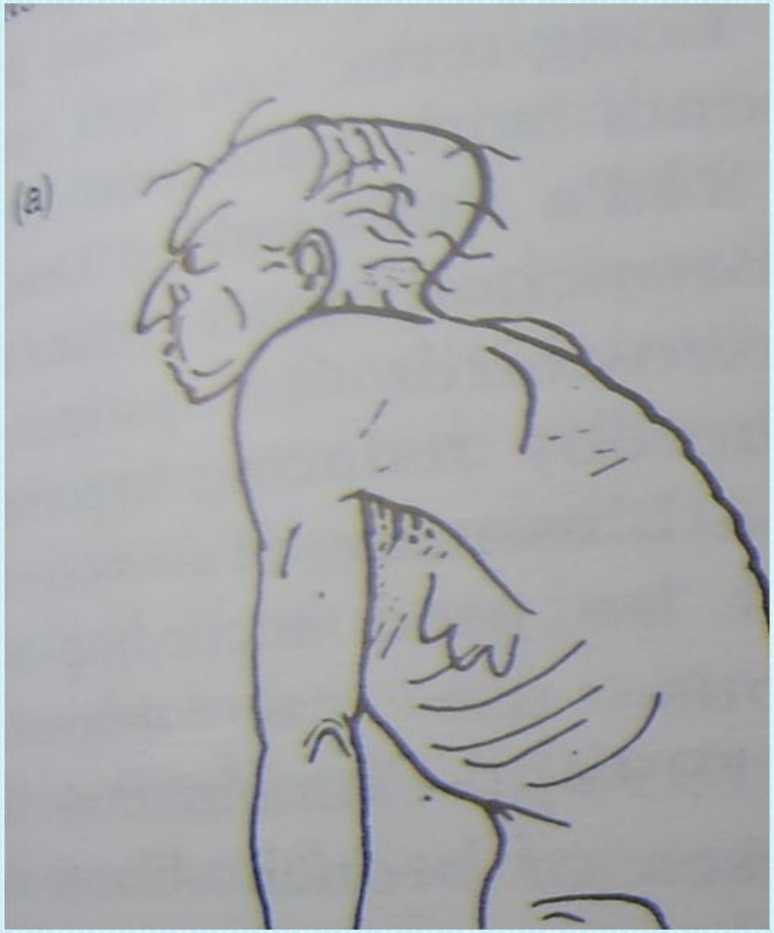

PRIMARY EMPHYSEMA
Congenital lack of alpha-anti-trypsin
Protein Breakdown
SECONDARY EMPHYSEMA
Alveolar damage due to smoking
Erosion of alveolar septa
Dilatation of distal airspaces
Destruction of elastic fibres
Floppy airways collapse

PROGRESSION OF COPD



PATTERN OF COPD





BLUE AND BLOATED

- Pt. has following symptoms:

1. Obesity.
2. Mild Dyspnoea.
3. Copious Sputum.
4. Low PaO_2 and high $PaCO_2$.
5. Central Cyanosis with cor pulmonale.
6. Peripheral Edema.
7. Increased residual volume, normal TLC.

PINK AND PUFFING

- Pt. has following symptoms:

1.Thin ,anxious expression, severe breathlessness

2.Little or no sputum production

3. Relatively normal Po2 and Pco2.

4. Central cyanosis, no cor pulmonale.

5. No peripheral edema

6. Increased TLC due to hyperventilation

CLINICAL PRESENTATION

Common signs and symptoms of COPD may include:

- Cough
- Sputum (mucous) production
- Shortness of breath, especially with exercise/exertion
- Wheezing (a whistling or squeaky sound when you breathe)
- Chest tightness.

For certain severe COPD symptoms, hospitalization may be required. These symptoms include:

- a lot of difficulty catching breath
- a hard time talking
- lips or fingernails turn blue or gray
- not mentally alert
- heartbeat increased.

ASSESMENT

- Demographic data
- Chief complaints
- History

1 Present

2 Medical

3 Family

4 Personal & social

OBSERVATION

1. Posture: Dorsal kyphosis
2. Chest Shape: Barrel chest
3. Decreased thoracic excursion
4. Use of accessory muscles
5. Cyanosis
6. Digital clubbing
7. Pursed lip breathing

PALPATION

1. Pitting edema of LL.
2. Hypertrophy of accessory neck muscle.

EXAMINATION

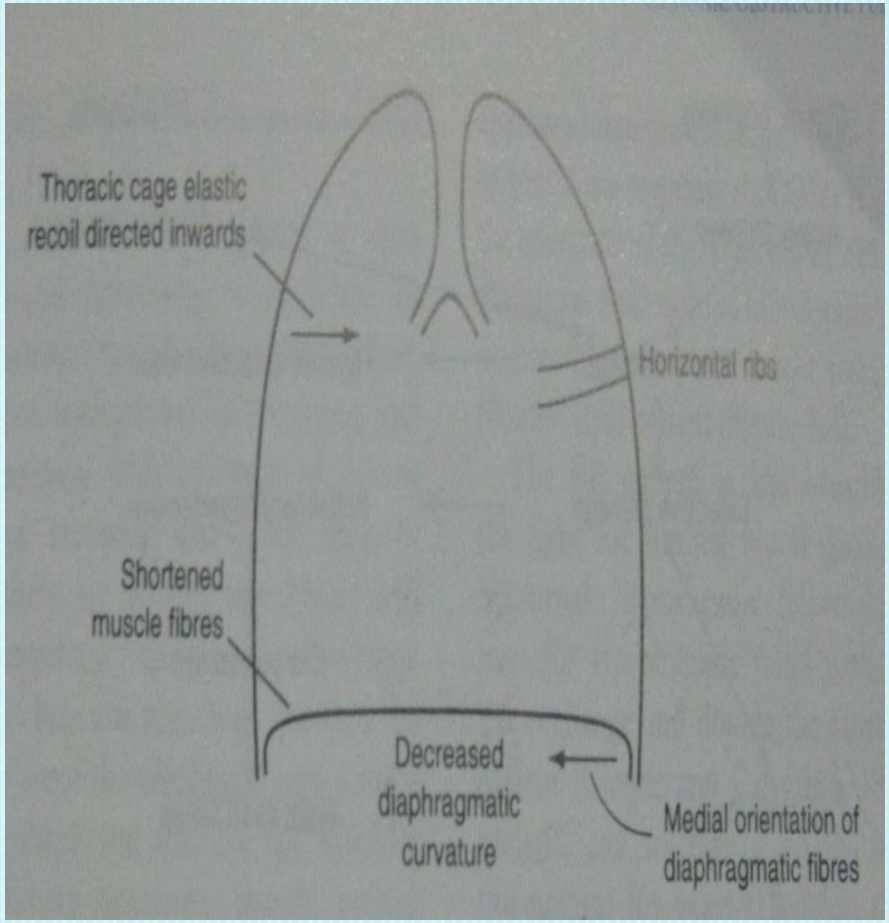
- Auscultation

  1. heart sounds

  2. Breath sounds – expiratory wheeze and crackles may be present.

- Measurement of strength
  1. peripheral
  2. ventilatory muscles
- Neck vein distention during expiration.

WORK OF BREATHING IS INCREASED



- Excess work of breathing is required to:

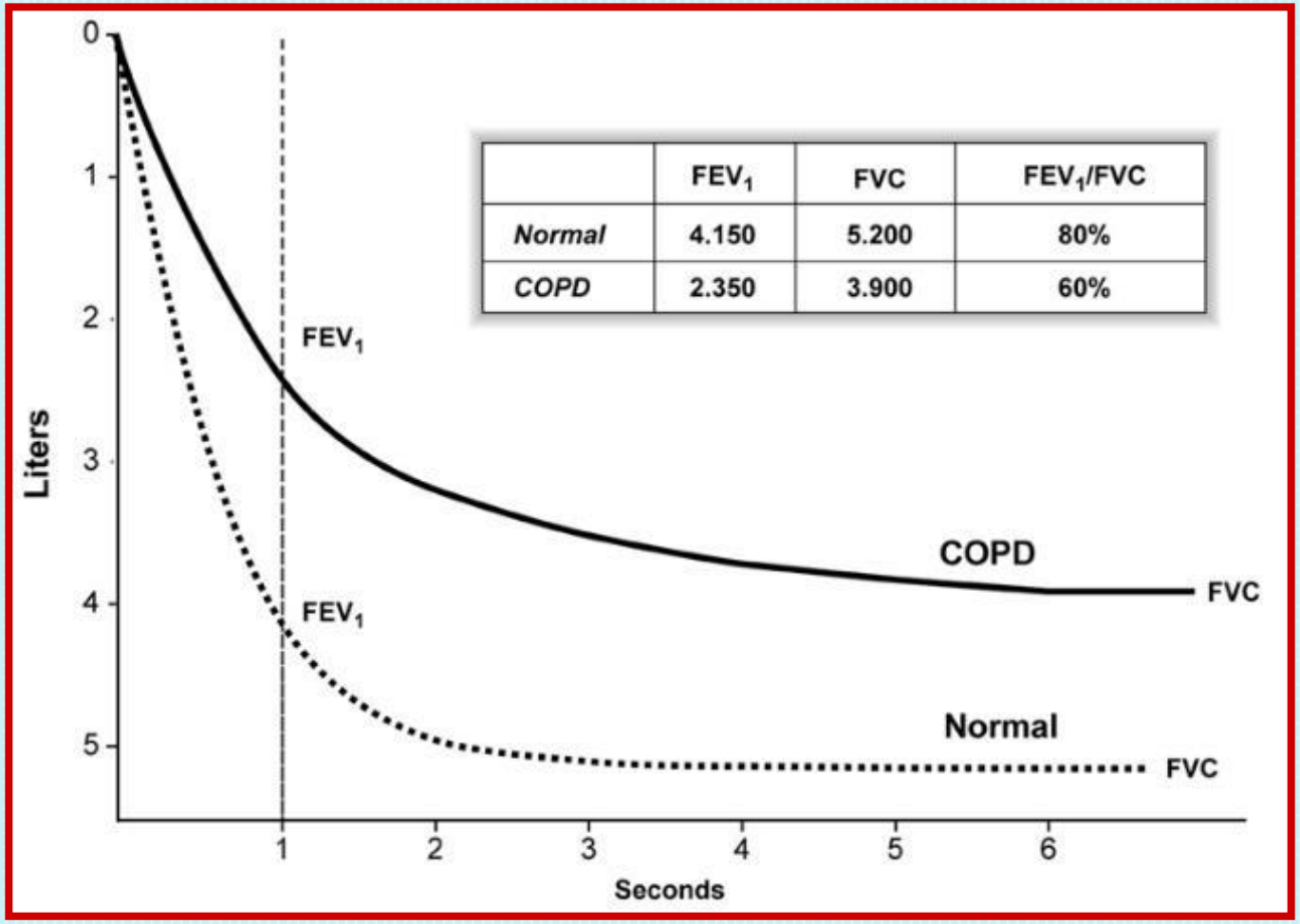
1. Overcome the resistance of obstructed airways
2. Assist expiration which becomes active rather than passive
3. Sustained inspiratory mscl. Action throughout the respiratory cycle
4. Hoover's sign
5. Compensate for the loss of bucket handle movement of ribs

INVESTIGATION

1. Blood Analysis
2. ECG for cor pulmonale
3. Radiograph
4. Sputum Analysis: colour, amount, consistensy
5. ABG
6. PFT
7. Alpha1 antitrypsin deficiency screening for Emphysema

Normal
Functional Residual Capacity
Inspiratory Capacity
IRV
TV
ERV
RV
Vital Capacity
Total Lung Capacity
Obstructive
Functional Residual Capacity
Inspiratory Capacity
IRV
TV
ERV
RV
Vital Capacity
Total Lung Capacity

SPIROMETRY : NORMAL & COPD



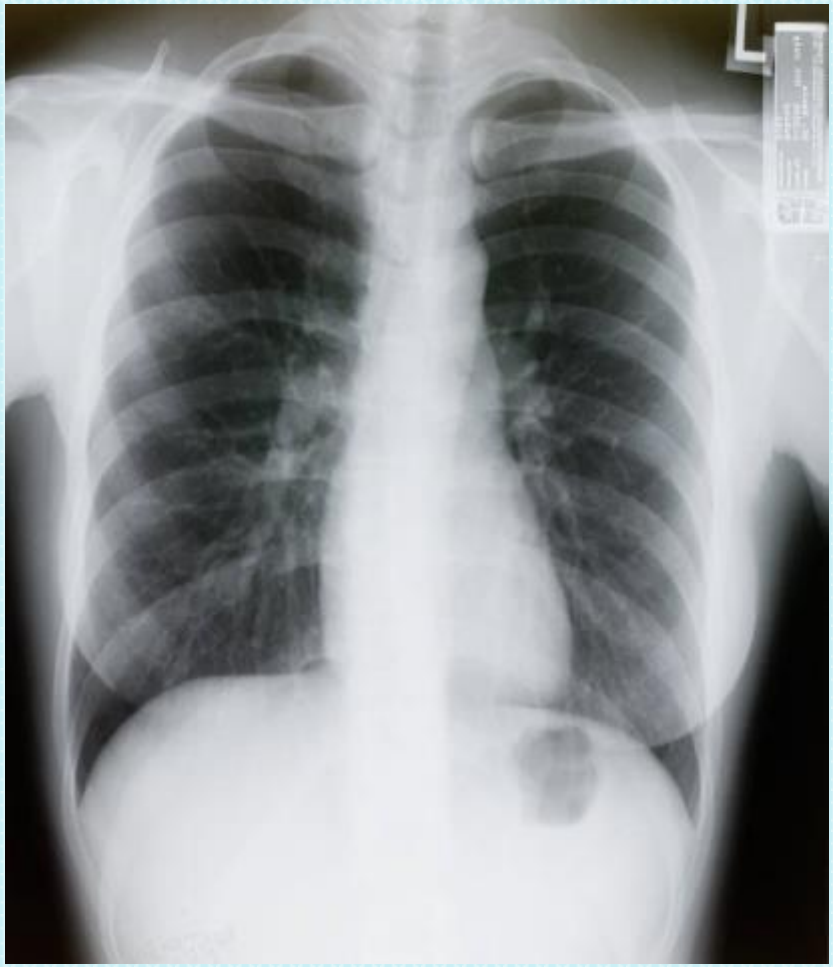
	FEV_1	FVC	FEV_1/FVC
Normal	4.150	5.200	80%
COPD	2.350	3.900	60%

Classification of COPD Severity by Spirometry

- Stage I: Mild — $FEV_1/FVC < 0.70$; $FEV_1 \geq 80\%$ predicted
- Stage II: Moderate — $FEV_1/FVC < 0.70$; $50\% \leq FEV_1 < 80\%$ predicted
- Stage III: Severe — $FEV_1/FVC < 0.70$; $30\% \leq FEV_1 < 50\%$ predicted
- Stage IV: Very Severe — $FEV_1/FVC < 0.70$; $FEV_1 < 30\%$ predicted *or* $FEV_1 < 50\%$ predicted *plus* chronic respiratory failure

X-RAY INTERPRETATION

- Lungs are enlarged so more than seven ribs can be counted
- Diaphragm – Flat
- AP diameter increased



- Bullae - densely black areas of lung, round, surrounded by hair line shadows in case of emphysema

- **Perform spirometry** if COPD seems likely.
- Airflow obstruction is defined as:
- • **FEV1 < 80% predicted**
- • **And FEV1/FVC < 0.7**
- *Spiro metric reversibility testing is not usually necessary as part of the diagnostic process or to plan initial therapy*

If still doubt about diagnosis consider the following pointers:

- Asthma may be present if:
  - there is a > 400 ml response to bronchodilators
  - serial peak flow measurements show significant diurnal or day-to-day variability
  - there is a > 400 ml response to 30 mg prednisolone daily for 2 weeks
- Clinically significant COPD is not present if FEV1 and FEV1/FVC ratio return to normal with drug therapy.
- Refer for more detailed investigations if needed

MEDICAL MANAGEN]MENT

- Smoking Cessation
- Pharmacological management
  - Maintenance
    1. Anti- cholinergics
    2. Long acting beta 2 agonist
    3. Steroids
    4. Cromolyn Na
    5. Leucoterine receptor antagonist
  - Rescue
    1. Short acting beta 2 agonist
- Antibiotics
- Supplemental oxygen

SURGICAL MANAGEMENT

- Bullectomy
- Lung volume reduction surgery
- Lung Transplantation