-: Respiratory System :-

BRONCHIAL ASTHMA

What is Asthma — Definition

- Asthma is
  - A chronic inflammatory ~~disease~~ disorder of the airways in which many cells and cellular elements play a role.
  - The chronic inflammation is associated with airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing particularly at night or early morning.
  - The episodes are usually associated with widespread but variable airflow obstruction with in the lung that is often reversible either spontaneously or with treatment.

Causes / Risk factors

Genetic susceptibility and gene-environment interactions

Environmental Risk factors

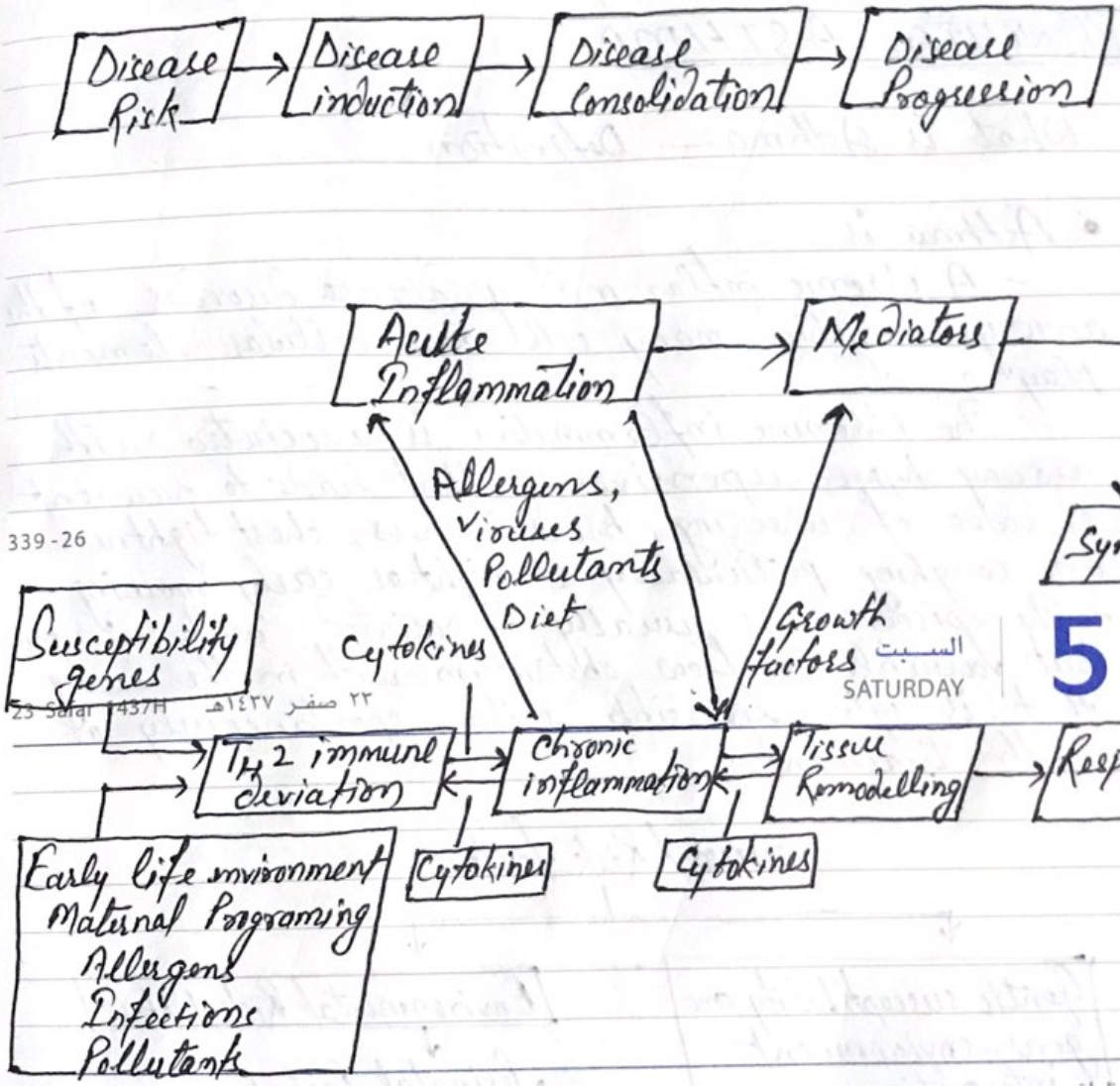
- Perinatal factors
- Indoor and outdoor allergens
- Smoking
- other pollutants
- Obesity
- Respiratory illness.

Notes ملاحظات

الجمعة
FRIDAY
4

22 Safar 1437H ٢٢ صفر ١٤٣٧هـ

—: How Asthma Develops :—



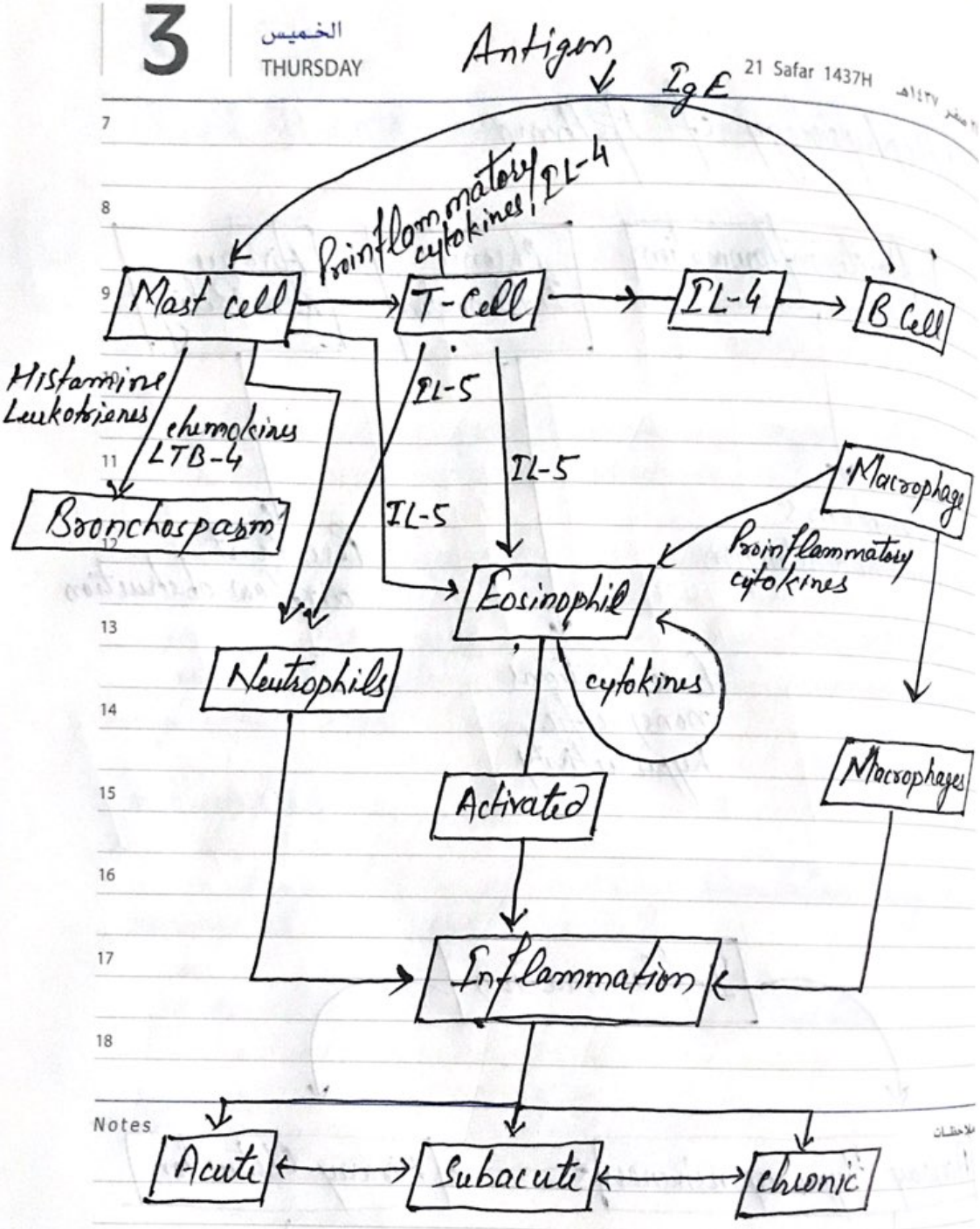
339 - 26

السبت
SATURDAY
5

23 Safar 1437H ٢٣ صفر ١٤٣٧هـ

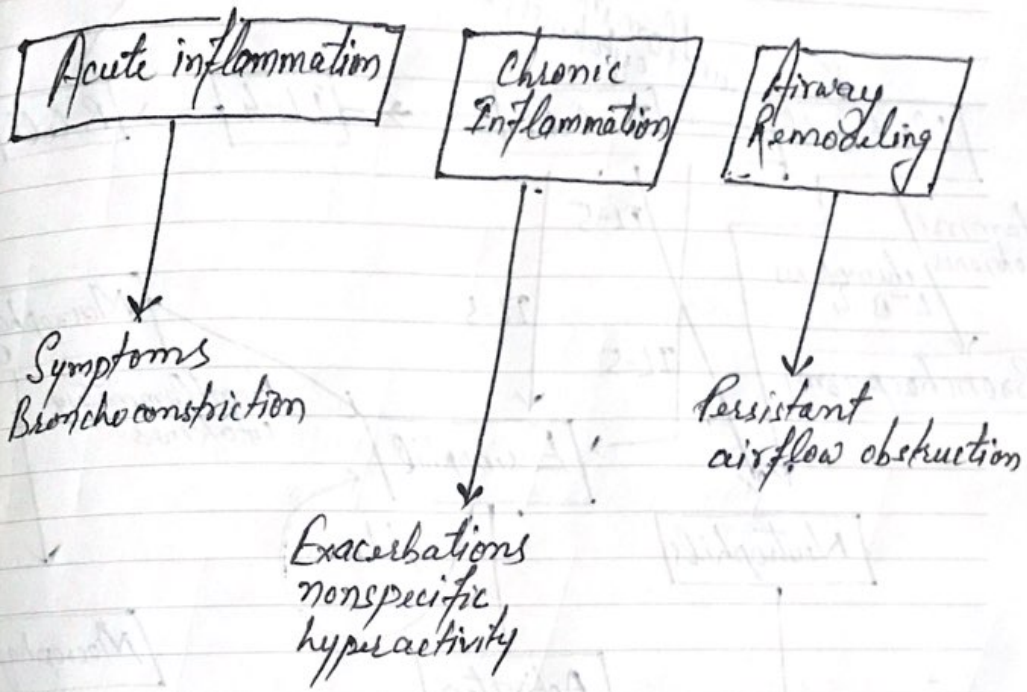
Notes
ملاحظات

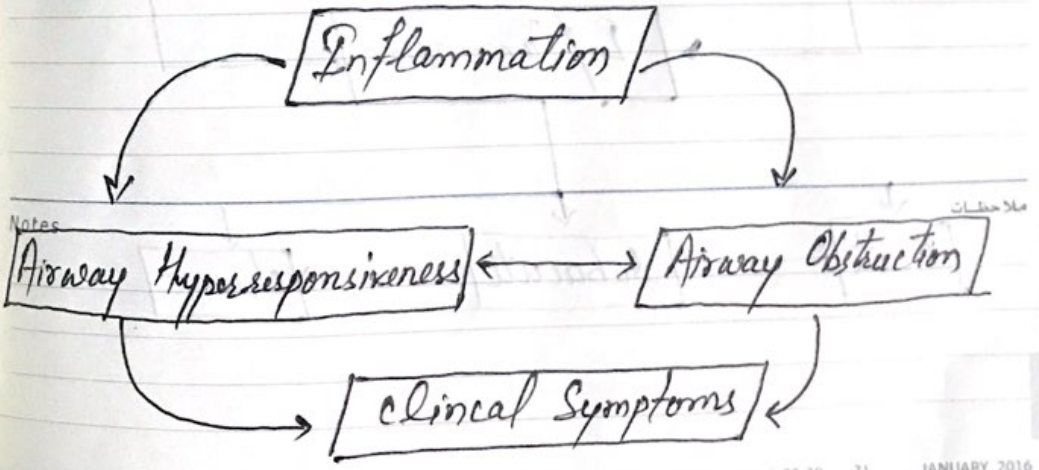
3 الخميس THURSDAY 21 Safar 1437H



Notes ملاحظات

Pathophysiology of Asthma





Notes ملاحظات

335

1 الثلاثاء TUESDAY

19 Safar 1437H

Airflow Limitation :-

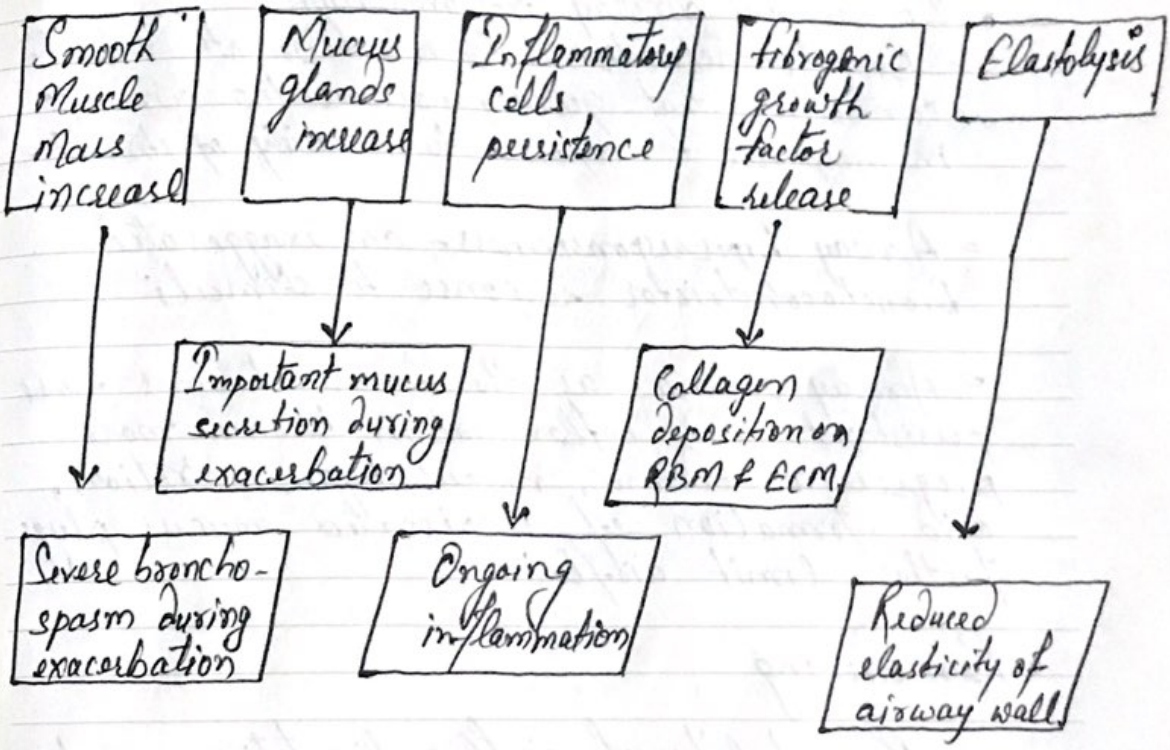
- Induced by airway inflammation
  = Bronchoconstriction - Bronchial smooth muscle contraction that quickly narrows the airways in response to exposure to a variety of stimuli.
  = Airway hyper-responsiveness - an exaggerated bronchoconstrictor response to stimuli
  = Airway edema - as the disease becomes more persistant and inflammation become more progressive, edema, mucus hyper secretions, and formation of inspissated mucus plugs further limit airflow.
- Remodeling
  = Reversibility of airflow limitation may be incomplete in some patients.
  =
  = Persistant changes in airway structure
    - Sub-basement fibrosis
    - Mucus hypersecretion
    - Injury to epithelial cells
    - Smooth muscle hypertrophy
    - Angiogenesis

Notes ملاحظات

18 Safar 1437H ١٨ صفر ١٤٣٧هـ

الإثنين MONDAY **30**

Consequences of Remodeling in Asthma



Notes ملاحظات

WEEK 49

11

29 الأحد SUNDAY 17 Safar 1437H

—: DIAGNOSIS :—

Key indicators for considering a diagnosis of Asthma

- Typical history
- Intermittent symptoms
- Association of symptoms to weather changes, dust, smoke, exercise, viral infection, animals with fur or feathers, house-dust mites, mold, pollen, strong emotional expression (laughing or crying hard), airborne chemicals or dust.
- Diurnal variation
- Family history
- Presence of atopy, allergic rhinitis, skin allergies.

Routine Investigations:—

- Hemogram including eosinophil count
- Blood gas analysis
- X-ray chest
- Serum electrolyte (Mg, Na, K)
- Spirometry

Notes

15 Safar 1437H ١٥ صفر ١٤٣٧هـ

الجمعة FRIDAY **27**

Goals of Asthma Therapy :-

- Prevent recurrent exacerbation and minimize the need for emergency department visits or hospitalization.
- Maintain normal pulmonary function.
- Maintain normal activity levels (including exercise and other physical activity).
- Provide optimal pharmacotherapy with minimal or no adverse effect.

332-33

16 Safar 1437H ١٦ صفر ١٤٣٧هـ

السبت SATURDAY **28**

Asthma is classified into four general categories :

Asthma classification	Sign and symptoms
• Mild intermittent	Mild symptoms upto 2 days a week and upto 2 nights a month.
• Mild persistant	Symptoms more than twice a week, but no more than ~~one night a week~~ once in a single day.
• Moderate persistant	Symptom once a day and more than one night a week.
• Severe persistant	Symptoms throughout the day on most days and frquently at night.

Notes

WEEK 48

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 DECEMBER
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19 20 21 22 23 24 25 26 27 28 29 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 SAFAR / RABIA I 1437

26 الخميس THURSDAY 14 Safar 1437H

Approaches to treatment :-

(i) Prevention of Ag:Ab reaction

(ii) Neutralization of IgE

(iii) Suppression of inflammation and bronchial hyperactivity - Corticosteroids

(iv) Prevention of release of mediators (Mast cell stabilizers)

(v) Antagonism of released mediators (Leukotrienes antagonists, antihistamine, PAF antagonists)

(vi) Blockade of constrictor neurotransmitter (anticholinergic)

(vii) Mimicking dilator neurotransmitter (Sympathomimetics)

(viii) Directly acting bronchodilators (Methylxanthines)

Notes

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

- COPD is also known as chronic obstructive lung disease (COLD), chronic obstructive airway disease (COAD), chronic airflow limitation (CAL) and chronic obstructive respiratory disease (CORD)
- COPD is also an inflammatory disease of the lungs characterized by progressive emphysema (alveolar destruction) and bronchiolar fibrosis in variable proportions.
- Loss of bronchiolar elasticity leads to closure of smaller air tubes during expiration. The airway obstruction is accentuated during exercise causing shortness of breath.
- The expiratory airflow limitation does not fluctuate markedly over long periods of time, but there are exacerbations precipitated by respiratory infections, pollutants, etc.
- In COPD, less air flows in and out of the airways because of one or more of the following:
  - The airways and air sacs lose their elastic quality.
  - The walls between many of the air sacs are destroyed.

Notes ملاحظات

24 الثلاثاء TUESDAY 12 Safar 1437H

- The walls of the airways become thick and inflamed
- The airways make more mucus than usual, which tends to clog them.

- It is the 4th leading cause of mortality and 12th leading cause of disability in the United States.
- In 2020 COPD is the 3rd leading cause of death.

— : CAUSES :—

(1) Smoking

(2) Occupational Exposures — exposure to workplace dust found in coal mining, gold mining and the cotton textile industry and chemicals such as Cadmium, isocyanates, and fumes from welding have been implicated in the development of airflow obstruction.

(3) Air Pollution

(4) Sudden airway constriction in response to inhaled irritants.

Notes ملاحظات

(5) Bronchial hyper-responsiveness, is a characteristic of asthma.

(6) Genetics - Alpha 1-anti-trypsin deficiency is a genetic condition that is responsible for about 2% of cases of COPD. In this condition, the body does not make enough of a protein, alpha 1-antitrypsin. Alpha-1-antitrypsin protects the lungs from damage cause by protease enzymes, such as elastase and trypsin, that can be released as a result of an inflammatory response to tobacco smoke.

Notes ملاحظات

22 الأحد SUNDAY 10 Safar 1437H

-: PATHOPHYSIOLOGY :-

Abnormal inflammatory response of the lung due to toxic gases

↓

Response occurs in the airways, parenchyma & pulmonary vasculature

↓

Narrowing of the airways takes place

↓

Destruction of parenchyma lead to emphysema

↓

Destruction of lung parenchyma leads to an imbalance of proteinases/antiproteinases.
(this proteinases inhibitors prevents the destructive process)

↓

Pulmonary Vasculature changes:
- Thickening of vessels
- Collagen deposit
- Destruction of capillary beds

↓

Mucus hypersecretion (cilia dysfunction, airflow limitations).

↓

Chronic cough and sputum production

Notes ملاحظات

8 Safar 1437H ٨ صفر ١٤٣٧هـ

الجمعة FRIDAY **20**

CLINICAL FEATURES :-

- Chronic cough
- Sputum Production
- Wheezing
- Chest tightness
- Dyspnoea on exertion

325-40

- Weight loss
- Respiratory Insufficiency
- Respiratory Infections

9 Safar 1437H

السبت SATURDAY **21**

- Barrel chest - chronic hyperinflation leads to loss of lungs elasticity.

COPD includes
(i) Bronchitis
(ii) Emphysema

Notes ملاحظات

Irritants irritate the airway

↓

Excess mucus production

↓

Inflammation

↓

Cause the mucus secreting glands and goblet cells to increase in number. ciliary function is reduced

↓

More mucus production

↓

Bronchial walls become thickened and lumen narrows and mucus plug the airway.

↓

Alveoli ~~adjacent~~ adjacent to the bronchioles may become damaged and fibrosed

↓

Notes ملاحظات

Alter function of alveolar macrophages

↓

Infection

Sign & Symptoms :- (Acute)

- Sore throat
- fatigue (tiredness)
- fever, body aches
- Stuffy or sunny nose
- Vomiting
- Diarrhea
- Persistant cough
- Cough may produce clear mucus
- Shortness of breath

CHRONIC -
- Coughing
- Wheezing
- chest discomfort
- The coughing may produce large amounts of mucus.

Notes ملاحظات

17 الثلاثاء TUESDAY 5 Safar 1437H

MANAGEMENT :-

- Medical Management
- Surgical Management
- Nursing Management

- Medical Management :-
  (1) Improve Ventilation -
  = Bronchodilators like β_2 agonists, Anticholinergic
  = Methylxanthine
  = Corticosteroids
  = Oxygen administration

  (2) Remove bronchial Secretion

  (3) Promote exercises

  (4) Control complications

  (5) Improve general health

- Surgical Management :-

Notes

(1) Bullectomy - Bullae are enlarged airspaces that do not contributed to ventilation but occupy space in thorax, these areas may be surgically excised.

الإثنين
MONDAY
16

4 Safar 1437H ٤ صفر ١٤٣٧هـ

(2) Lung Volume Reduction Surgery - It involves the removal of a portion of the diseased lung parenchyma. This allows the functional tissue to expand.

(3) Lung Transplantation -

- Nursing Management
  - (1) Assessment
  - (2) Physical examination
  - (3) Diagnosis
  - (4) Intervention

Notes ملاحظات

15 الأحـــد SUNDAY 3 Safar 1437H ٣ صفر ١٤٣٧هـ

Self Management of COPD

- Take your medications regularly as prescribed, if you any doubt ring your hospital.
- Exercise regularly everyday or else atleast 4 out of 7 days.
- Remember take your vaccination regularly
- Stay away from infections by ~~reactive~~ maintaining good hygeine.
- Quit smoking
- Eat a regular balanced diet
- Drink plenty of plain fresh water atleast 1.5L/day
- Get plenty of sleep.

Notes ملاحظات