بسم الله الرحمن الرحيم

COLLEGE OF MEDICINE

432

ASTHMA

Done By

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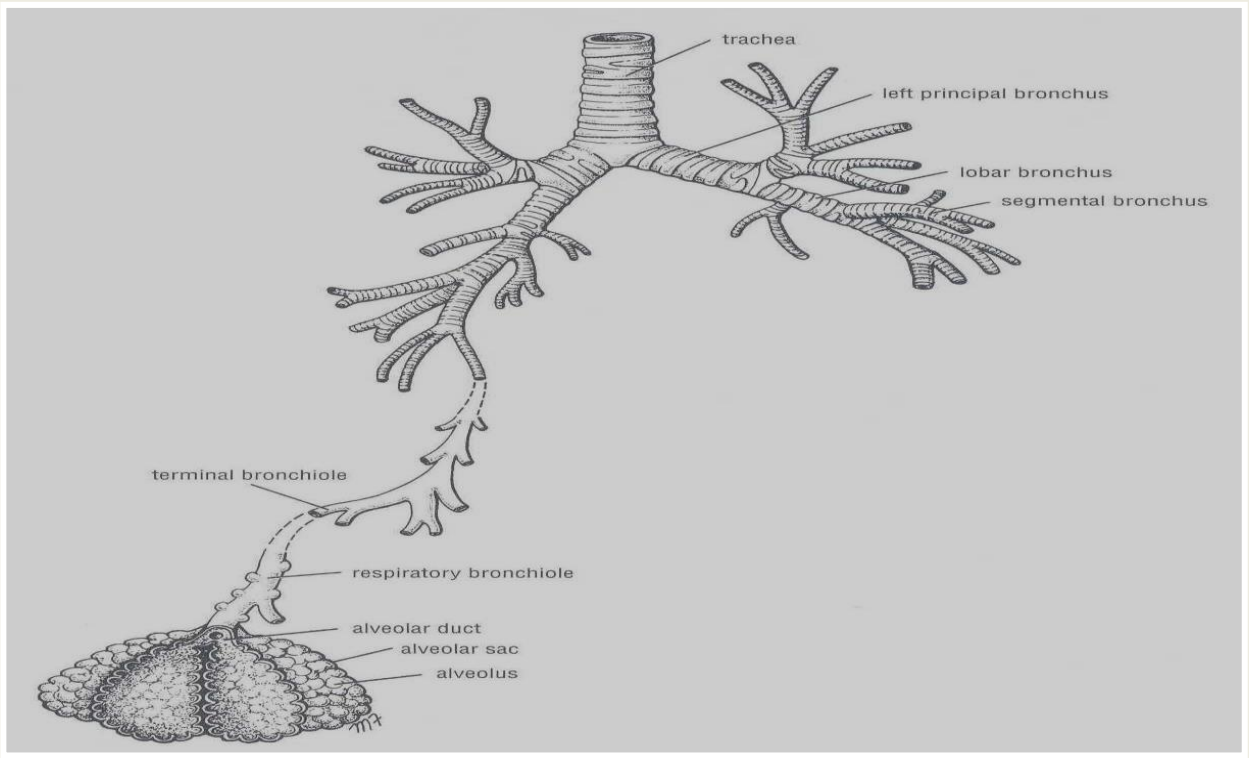
*please make sure you read the objectives from the reading material file

Asthma:

Asthma is a chronic inflammatory disease of the airways characterized by variable airway obstruction and airway hyperresponsiveness (AHR)

http://www.youtube.com/watch?v=4aK76DoxKGk

❖ Brochoial tree*:



1-Conduction zone branches

Primary (main) bronchi.

Secondary (lobar) bronchi.

Tertiary (segmental) bronchi. (supply the bronchopulmonary segment).

Smaller bronchi.

Bronchioles.

Terminal bronchioles.

2-Respiratory zone branches

Respiratory bronchioles.

Alveolar ducts.

Alveolar sacs.

Alveoli.

*note: this information was deeply discussed in the theory part.

- **Muscles used by normal breathing:**

Normal inspiration:

Diaphragm and external intercostal muscles

Forced inspiration:

scalene muscles, pectoralis major and minor and sternocleidomastoid

-

Normal expiration:

By elastic recoil

Forced expiration

Rib depressors:

Internal intercostal, innermost intercostal,Subcostals and Transversus thoracis

Anterior abdominal wall muscles:

External oblique, Internal oblique, Transversus abdominis and Rectus abdominis

- **Physiology of gas exchange**:

You can read about this point in Guyton (pocket)

from P305-P308

For more:

http://people.eku.edu/ritchisong/301notes6.htm

❖ Signs and symptoms:

Coughing

Wheezing

Chest tightness

Shortness of breath

❖ Pathogensis of asthma:

While asthma is considered an inflammatory disorder of the conducting airways, it is becoming increasingly apparent that the disease is heterogeneous with respect to immunopathology, clinical phenotypes, response to therapies, and natural history. Once considered purely an allergic disorder dominated by Th2-type lymphocytes, IgE, mast cells, eosinophils, macrophages, and cytokines, the disease also involves local epithelial, mesenchymal, vascular and neurologic events that are involved in directing the Th2 phenotype to the lung and through aberrant injury-repair mechanisms to remodeling of the airway wall. Structural cells provide the necessary "soil" upon which the "seeds" of the inflammatory response are able to take root and maintain a chronic phenotype and upon which are superimposed acute and subacute episodes usually driven by environmental factors such as exposure to allergens, microorganisms, pollutants or caused by inadequate antiinflammatory treatment. Greater consideration of additional immunologic and inflammatory pathways are revealing new ways of intervening in the prevention and treatment of the disease. Thus increased focus on environmental factors beyond allergic exposure (such as virus infection, air pollution, and diet) are identifying targets in structural as well as immune and inflammatory cells at which to direct new interventions

❖ Pathology of asthma:

The presence of chronic airway inflammation in asthmatic patients has been known for over a century, but the relationship of this inflammatory process to the pathogenesis of reversible airflow obstruction and non-specific bronchial hyperresponsiveness remains unclear. In recent years, the increasing ability to sample the lower respiratory tract of living asthmatic patients, coupled with revolutionary advances in immunology and molecular biology, has resulted in extensive evaluation of inflammatory cells and mediators implicated in the pathogenesis of asthma. In addition, there is increasing recognition that airway remodeling, characterized by thickening of all compartments of the airway wall, may have profound consequences on the mechanics of airway narrowing in asthma and contribute to the chronicity and progression of the disease. In this brief review, I will describe the gross and microscopic pathology of asthma, the process of airway remodeling and its functional consequences, and speculate on future directions to improve our understanding of the structural changes of asthma and their pathogenic role

❖ Pharmacology drugs used in asthma mangment:

1-Long-term asthma control medications:

generally taken daily, are the cornerstone of asthma treatment. These medications keep asthma under control on a day-to-day basis and make it less likely you'll have an asthma attack. Types of long-term control medications include:

•Inhaled corticosteroids

•Leukotriene modifiers: including montelukast, zafirlukast and zileuton

•Long-acting beta agonists. salmeterol and formoterol

•Combination inhalers. fluticasone-salmeterol, budesonide-formoterol and mometasone-formoterol.

•Theophylline. Theophylline

2-Quick-relief (rescue) medications are used as needed for rapid, short-term symptom relief during an asthma attack — or before exercise if your doctor recommends it. Types of quick-relief medications include:

•Short-acting beta agonists. Albuterol and pirbuterol

•Ipratropium

•Oral and intravenous corticosteroids.prednisone and methylprednisolone

❖ Peak expiratory flow (PEK):

The peak expiratory flow (PEF), also called peak expiratory flow rate (PEFR) is a person's maximum speed of expiration, as measured with a peak flow meter, a small, hand-held device used to monitor a person's ability to breathe out air. It measures the airflow through the bronchi and thus the degree of obstruction in the airways

Function:

Peak flow readings are higher when patients are well, and lower when the airways are constricted. From changes in recorded values, patients and doctors may determine lung functionality, severity of asthma symptoms, and treatment options.

First measure of precaution would be to check patient for signs and symptoms of asthmatic hypervolemia. This would indicate whether or not to even continue with the Peak Flow Meter procedure. Measurement of PEFR requires training to correctly use a meter and the normal expected value depends on a patient's sex, age and height. It is classically reduced in obstructive lung disorders such as asthma.

Due to the wide range of ‘normal' values and high degree of variability, peak flow is not the recommended test to identify asthma. However, it can be useful in some circumstances.

A small proportion of people with asthma may benefit from regular peak flow monitoring. When monitoring is recommended, it is usually done in addition to reviewing asthma symptoms and frequency of reliever medication use

When peak flow is being monitored regularly, the results may be recorded on a peak flow chart.

It is important to use the same peak flow meter every time.

For more detalies about PEK:

http://en.wikipedia.org/wiki/Peak_expiratory_flow