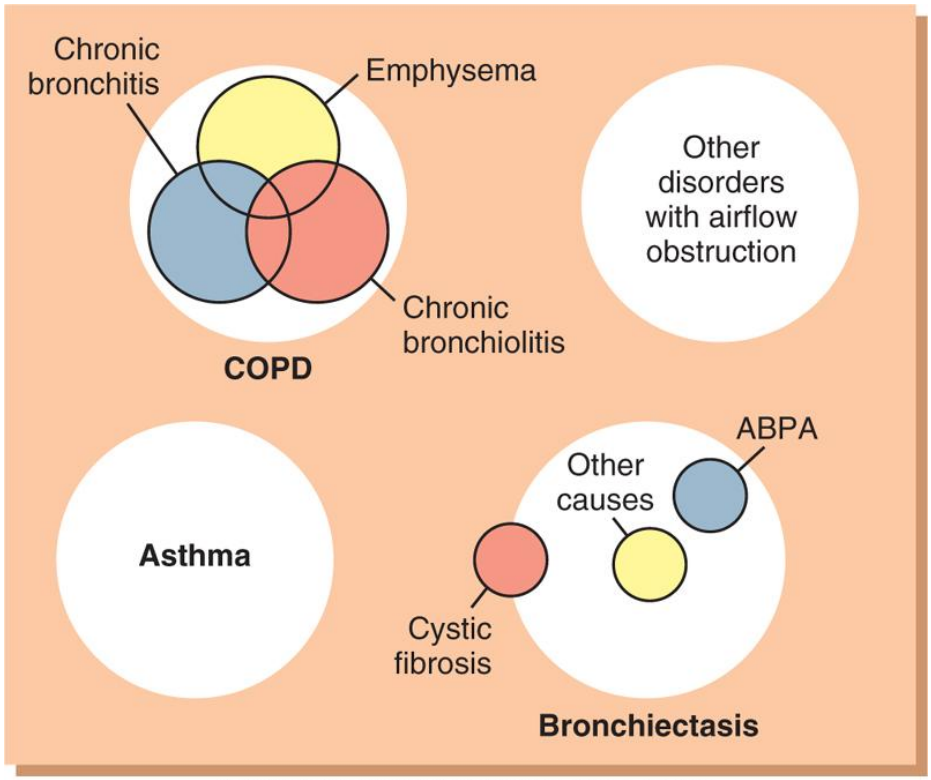
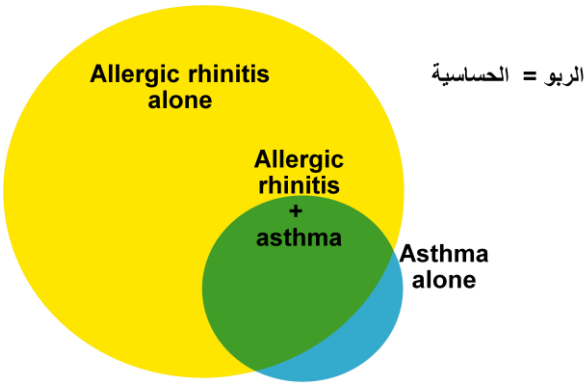
427 notes edited

Bronchial Asthma
Edited by 429 medicine Team



◈ Bronchial Asthma :

- **Most Patients with Asthma Have Allergic Rhinitis.**
- Approximately **80%** of asthmatics have allergic rhinitis



الربو = الحساسية

◈ What is Asthma ?

- Asthma is a common pulmonary disorder characterized by
  - airway inflammation,
  - airway hyper-reactivity (hyperresponsiveness)
  - Reversible airflow obstruction
- The incidence of asthma is highest in children, but it affects **all ages** and occurs worldwide, with a preponderance of the disease in developed industrialized countries
- Infiltration of mast cells, eosinophils and lymphocytes in response to allergens.
- Recurrent episodes of wheezing, coughing and shortness of breath.
- Variable and often reversible airflow limitation (airway obstruction).
- the bronchioles are 1. Twitchy 2. Irritable 3. Hyperresponsive

◈ Factors that Influence Asthma Development and Expression :

- **Host Factors :**
  - Genetic: this means that your body is genetically programmed to react to allergens
    - Atopy.
    - Airway hyperresponsiveness.
  - Gender: female are more prone to asthma.
  - Obesity.
- **Environmental Factors :**
  - Indoor allergens.
  - Outdoor allergens.
  - Occupational sensitizers.
  - Tobacco smoke.
  - Air Pollution.
  - Respiratory Infections.
  - Diet.

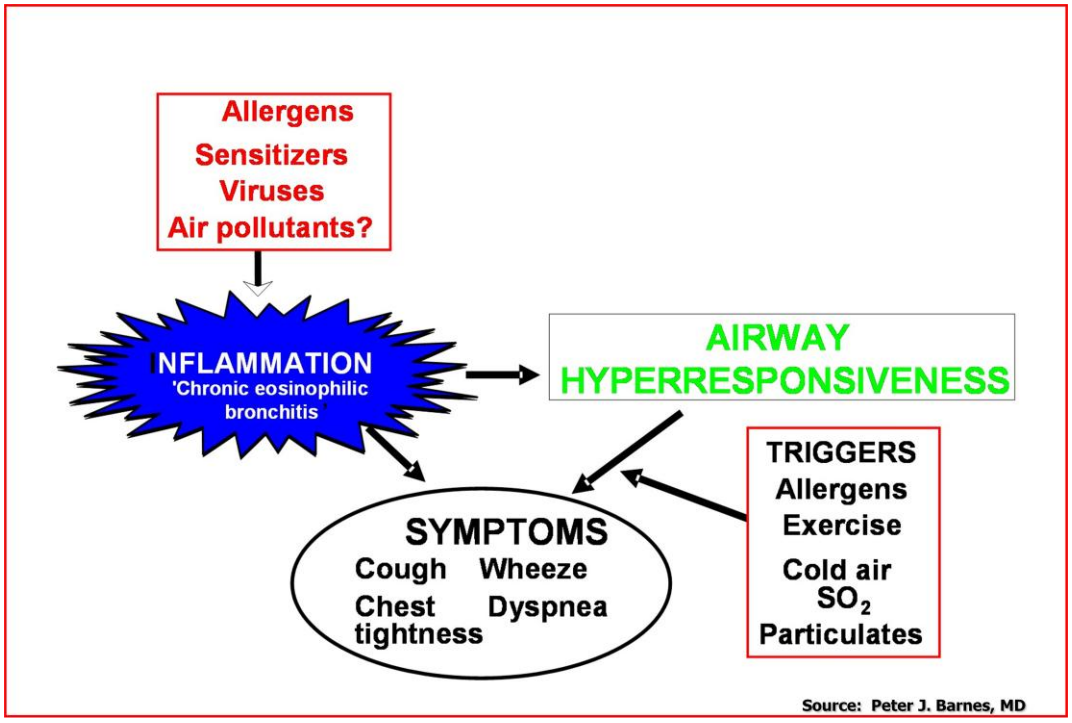
◈ Triggers of Asthma Attacks :

- Narrowing of airways occurs in response to inflammation or hyperresponsiveness to triggers, including :
  - Allergens.
  - Infections.
  - Diet/Medications.
  - Strong Emotions.
  - Exercise.
  - Cold temperature.
  - Exposure to irritants.

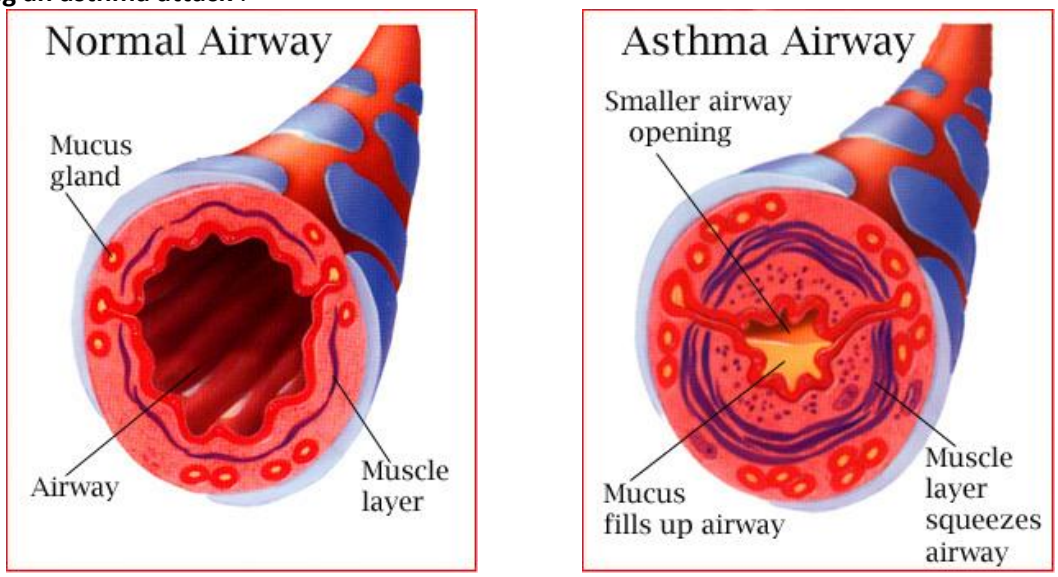
Allergens: are materials that contain proteins or any biological structure that the body can react to

Triggers: anything that can cause symptoms of asthma like cold weather

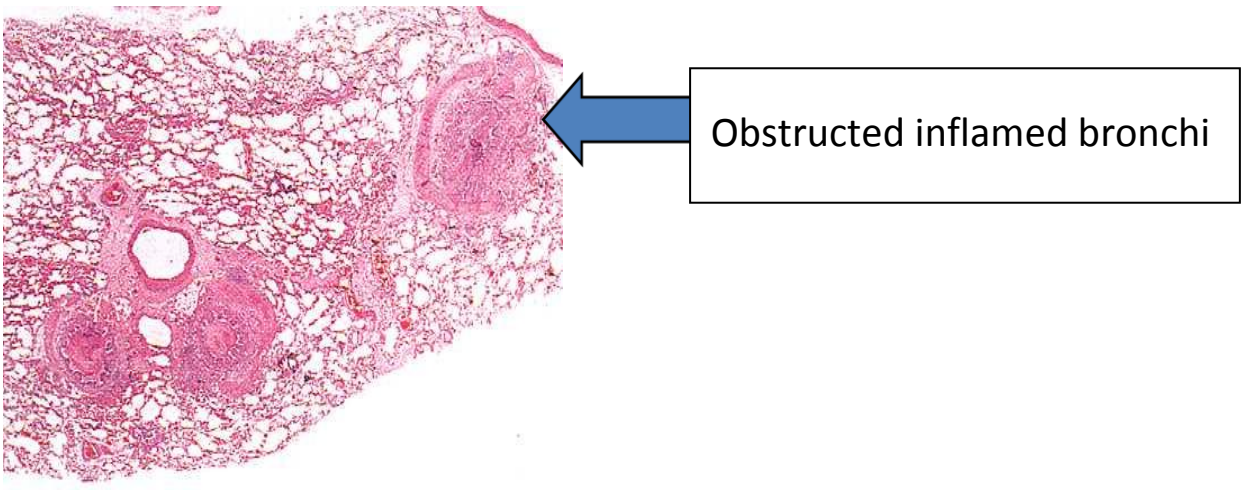
◈ Mechanisms of Asthma Inflammation :



- **During an asthma attack** :



You can see the narrow, edamatous, mucus filled bronchi clearly in an asthma airway

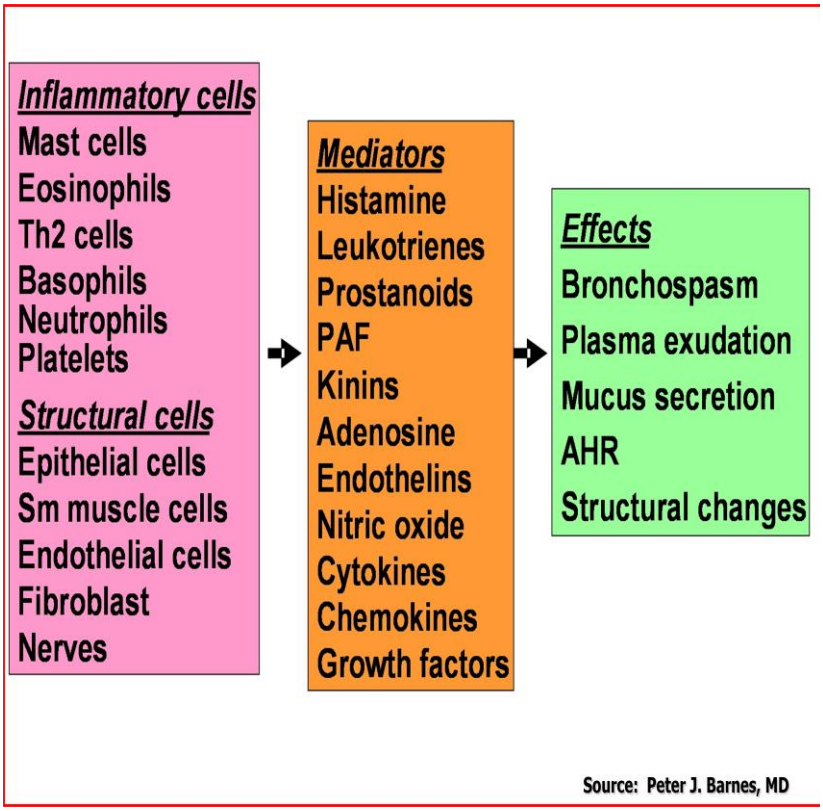


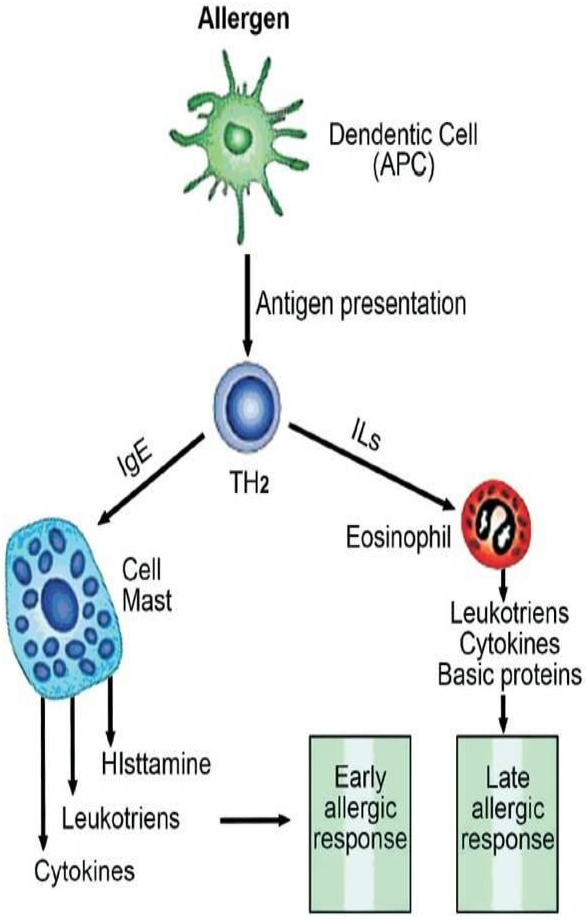
- **Bronchoconstriction** :

Before

10 Minutes after Allergen Challenge

- Asthma Inflammation – Cells and Mediators **:**

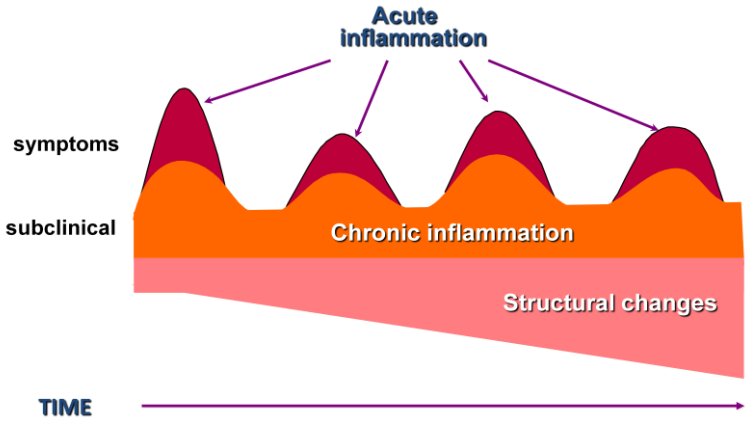




So remember the following points:

- Asthma is generally associated with an allergic-type activation of the immune system typified by a
  - helper T-cell subtype 2 (T_H2)-predominant T-cell response to inhaled antigens
  - consequent IgE production and allergic airway inflammation
  - IgE activates Mast cells and the symptoms appear early

"Real Life" Variability in Asthma:



In subclinical asthma this means that the inflammation is still going on and due to this structural changes like fibrosis and thickened walls will occur

◈ DIAGNOSIS OF ASTHMA :

- **History and patterns of symptoms**.
    - Physical examination.
        - Measurements of lung function.

◈ Clinical features :

- Intermittent symptoms: SOB, Wheezing, Chest tightness and cough
    - Symptoms are variable in severity and may not be present simultaneously
    - Usually occur within 30 minutes of exposure to triggers
- Symptoms are typically worse at night
- Wheezing is the most common finding in physical examiantion

◈ Physical Examination :

- **Wheeze :** Usually heard with or without a stethoscope.
- **Rhonchi :** heard with a stethoscope.
- **Dyspnea :** Use of accessory muscles.
- Remember : ***Absence of symptoms at the time of examination does not exclude the diagnosis of asthma*.**

- Asthma is diagnosed clinically by history and P/E
- In case of doubt :
    - PFT (Pulmonary Function Test).
    - Methacholine challenge test.

PATIENT HISTORY :

- Has the patient had an attack or recurrent episodes of wheezing ?
- Does the patient have a troublesome cough, worse particularly at night, or on awakening ?
- Does the patient cough after physical activity (e.g. Playing) ?
- Does the patient have breathing problems during a particular season (or change of season) ?
- Do the patient's colds 'go to the chest' or take more than 10 days to resolve ?
- Does the patient use any medication (e.g. bronchodilator) when symptoms occur? Is there a response ?
- ***If the patient answers "YES" to any of the above questions, suspect asthma.***

◈ What Types of Spirometers Are Available ?


Simplicity


Spirotel


Sensaire


Satellite


SpiroCard

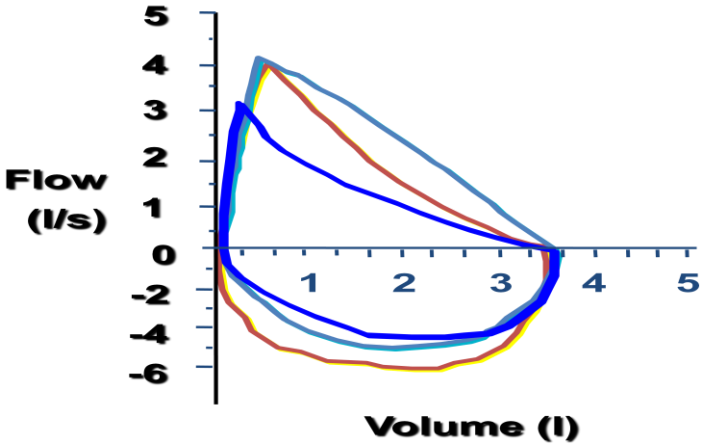

MicroPlus


Renaissance


KoKo


Vitalograph 2120

◈ Spirometry : Flow-Volume Loops in Asthma :



◈ Peak Flow Meter :

- **ICS** = inhaled cortico-steroids
  - **Budesonide, Fluticasone, Beclomethasone.**
- **β2 Agonists** (stimulants)
  - Short acting (SABA) : **Salbutamol**.
  - Long Acing (LABA) :
    - Rapid acting : **Formeterol**.
    - Non- Rapid acting : **Salmeterol**.
- Combinations :
  - **Symbicort** : Budesonide + Formoterol
  - **Seretide** : Fluticasone + Salmeterol

Budesonide	=	**Pulmicort**
Fluticasone	=	**Flixotide**
Salbutamol	=	**Ventolin**
Formeterol	=	**Oxis,Foradil**
Salmeterol	=	**Serevent**

◈ Reliever / Rescue :

- Bronchodilator (beta$_2$ agonist).
- Quickly relieves symptoms (within 2-3 minutes).
- **Not for regular use**.
- Reliever Medications :
  - Rapid-acting inhaled β_2 agonists
  - Systemic glucocorticosteroids :
    - Anticholinergics.
    - Theophylline.
  - Short-acting oral β_2 agonists

◈ Preventer / Controller :

- Anti-inflammatory.
- Takes time to act (1-3 hours).
- Long-term effect (12-24 hours).
- **Only for regular use** (whether well or not well).
- Controller Medications :
  - Inhaled glucocorticosteroids.
  - Leukotriene modifiers.
  - Long-acting inhaled β_2 agonists.
  - Systemic glucocorticosteroids.
  - Theophylline.
  - Cromones.
  - Long-acting oral β_2 agonists.
  - Anti-IgE.
  - Systemic glucocorticosteroids.

◈ Stepwise Approach:

<table>
<tr><th></th><th>1
Mild
Intermittent</th><th>2
Mild Persistent</th><th>3
Moderate Persistent</th><th>4
Severe Persistent</th></tr>
<tr><td>Quick Reliever</td><td>Short-acting bronchodilator : inhaled β_2 agonist as needed</td><td>Short-acting bronchodilator : inhaled β_2 agonist as needed</td><td>Short-acting bronchodilator : inhaled β_2 agonist</td><td>Short-acting bronchodilator : inhaled β_2 agonist
or Home nebulization (salbutamol, atrovent), (budesonide/fluticasone)</td></tr>
<tr><td rowspan="3">Controller</td><td rowspan="3">No daily medication needed</td><td colspan="3">Daily Medication .</td></tr>
<tr><td rowspan="2">Anti-inflammatory : inhaled steroid (low dose)
or Montelukast</td><td>either ICS (high dose)
or ICS (low-medium) & LABA</td><td rowspan="2">ICS (high dose) & LABA PLUS :
- Montelukast (Singulair)
- Theophylline SR
- Omalizumab (Xolair)
- Systemic steroids</td></tr>
<tr><td>+/- Montelukast</td></tr>
</table>

ICS: Inhaled corticosteroids

◈ Rules of Two:

- Use of a quick-relief inhaler more than: ***2 times per week*****.**
- Awaken at night due to asthma symptoms more than: ***2 times per month*****.**
- Refill of a quick-relief inhaler prescription more than: ***2 times per year*****.**
- ***Need controller medication***

◈ Poor Asthma Control :

- Before increasing medications, check :
  - Inhaler technique.
  - Adherence to prescribed regimen.
  - Environmental changes.
  - Also consider alternative diagnoses.

◈ Patients should learn to :

- Avoid risk factors.
- Take medications correctly.
- Understand the difference between "controller" and "reliever"medications.
- Monitor their status using symptoms and, if available, PEF. (ACT)
- Recognize signs that asthma is worsening and take action.
- Seek medical help as appropriate.

◈ Why inhalation therapy?

Oral	Inhaled
Slow onset of action	Rapid onset of action
Large dosage used	Less amount of drug used
Greater side effects	Better tolerated
Not useful in acute	Very effective

◈ Advantages of Spacer :

- No co-ordination required.
- No cold - freon effect.
- Reduced oropharyngeal deposition.
- Increased drug deposition in the lungs.

◈ Summary :

- Asthma can be controlled but not cured.
- It can present in anybody at any age.
- It produces recurrent attacks of symptoms of SOB , cough with or without wheeze.
- Between attacks people with asthma lead normal lives as anyone else.
- In most cases there is some history of allergy in the family.
- Understanding the disease, learning the technique and compliance with medications is the key for good control of asthma.