



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIOPULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME: PATHOLOGY II

II YEAR

UNIT II : PATHOLOGY OF LUNG

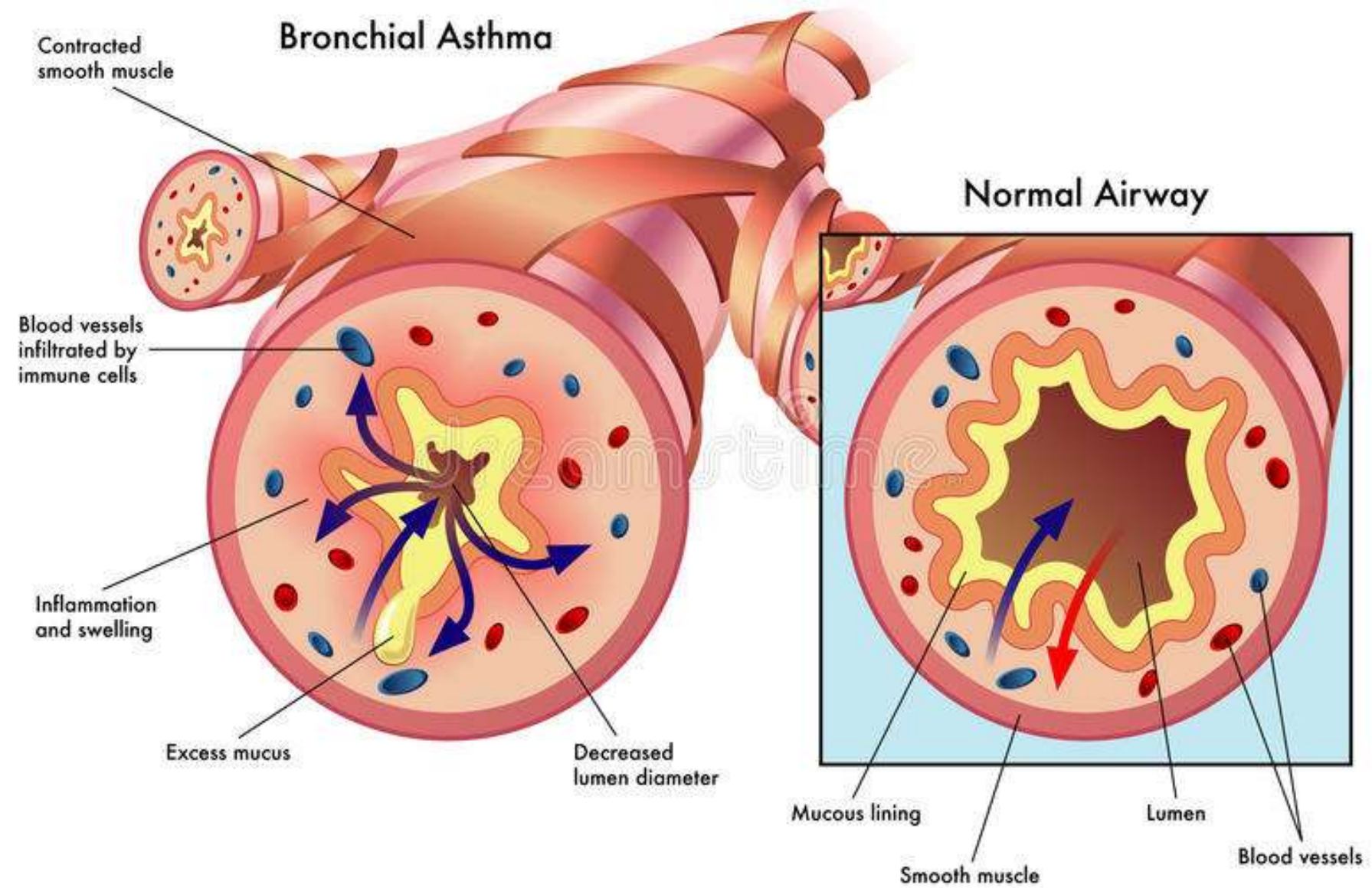
TOPIC 4 : BRONCHIAL ASTHMA



DEFINITION



- Bronchial Asthma is **reversible obstructive lung disease**
- It may be due to chronic air way inflammation and increased air way hyper-responsiveness
- Asthma is an episodic disease
- A severe and unremitting form of the disease termed **status asthmaticus** may prove fatal.
- Asthma leads to **bronchoconstriction**





SYMPTOMS



- Wheeze
- Cough
- Chest tightness
- Dyspnoea
- Air flow obstruction that is variable over short period of time or is reversible with treatment





EPIDEMIOLOGY



- Bronchial asthma is common and prevalent worldwide
- It occurs at all ages but nearly 50% of cases develop it before the age of 10 years.
- Bronchial asthma affects 300 million people world wide



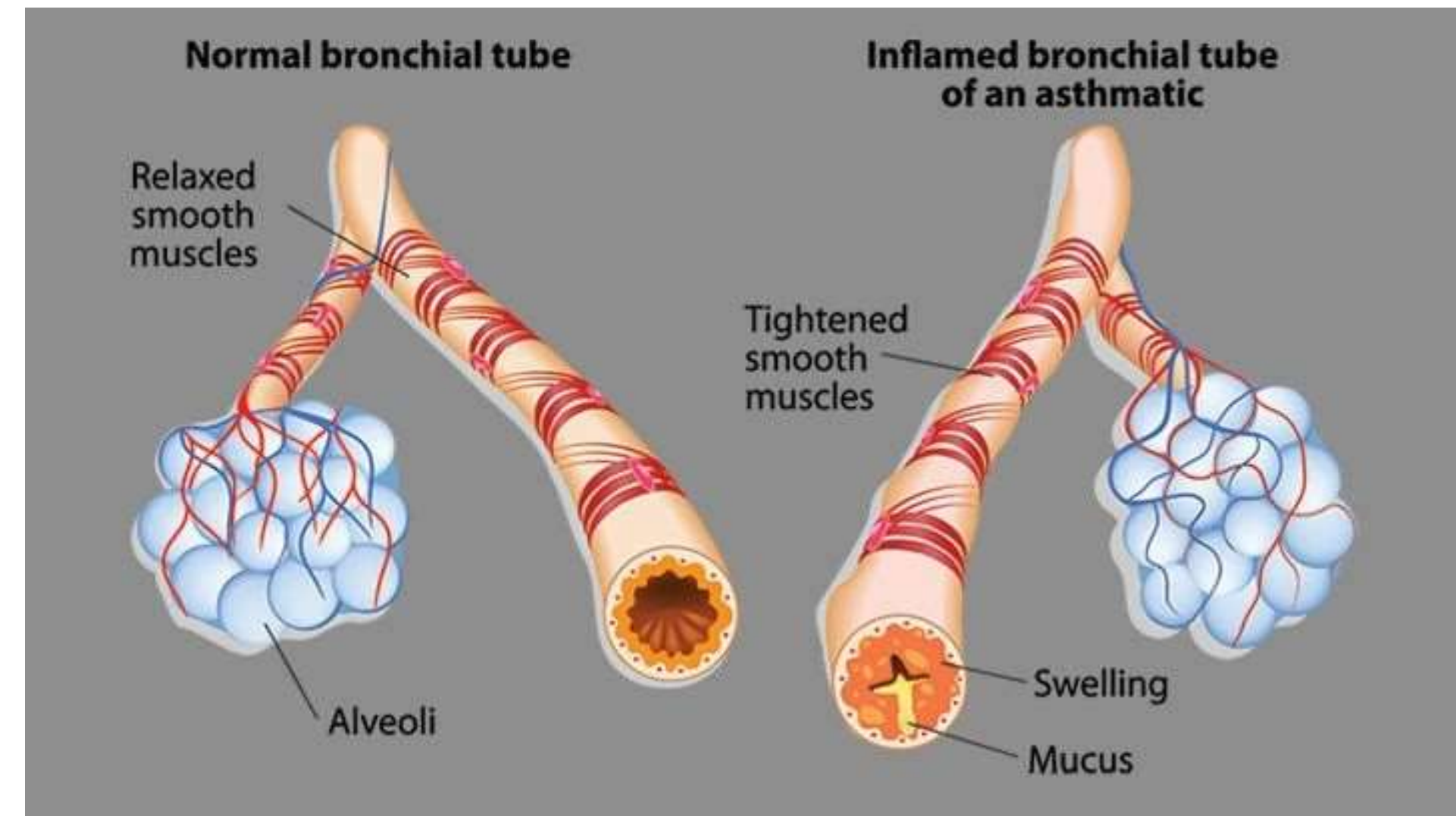


ETIOPATHOGENESIS



Based on the stimuli initiating bronchial asthma, two broad etiologic types are present

- **Extrinsic (atopic, allergic) asthma**
- **Intrinsic (idiosyncratic, non-atopic) asthma**
- **Mixed type**
- **Occupational Asthma**
- **Drug Induced Asthma**
- **Exercise Induced Asthma**





EXTRINSIC ASTHMA



- This is the **most common** type of asthma.
- It usually begins in childhood or in early adult life.
- Most patients of this type of asthma have personal and/or family history of preceding allergic diseases such as **rhinitis**, **Urticaria**
- **Allergens** cause ill-effects by inhalation
- Example: House dust, Pollens, Occupational exposure - fumes, gases





PHASES OF EXTRINSIC ASTHMA



- There are two responses - *Acute immediate response, Late phase reaction*

Acute immediate response

- It is initiated by IgE-sensitised mast cells on the mucosal surface
 - Mast cells on degranulation release mediators like histamine, Leukotrienes, prostaglandins, platelet activating factor and chemotactic factors
- ↓
- Bronchoconstriction, oedema, mucus Hyper-secretion and accumulation of Eosinophil's and Neutrophils

Late phase reaction

- Acute phase reaction for a prolonged time leads to late phase reaction
- It is caused by excessive mobilisation of blood leucocytes → release of mediators



INTRINSIC ASTHMA



- This type of asthma develops later in **adult life**
- It's a **non immune mechanism**
- **No family history** of allergy or associated allergies
- Most common cause is **respiratory tract infection – virus**
- Other triggering factors are Aspirin, Cold, Psychological stress, Exercise
- **Serum IgE is normal**





MIXED ASTHMA



- It is the combination of both allergic and non-allergic asthma
- This is the most common type of asthma





EXERCISE INDUCED ASTHMA



- Exercise-induced asthma, or exercise-induced bronchoconstriction (EIB), **happens when airways get smaller during exercise.**
- Asthma triggered by sports or exercising can make it hard for you to breathe.

Causes

- Overcooling of airways due to increased ventilation
- Drying of airways due to increased ventilation
- Mechanical irritation of airways due to greatly increased friction
- Bronchoconstriction due to alveolar hypocapnia (low CO₂ in lungs)



ALL THIS WILL LEAD TO INFLAMMATION AND IRRITATION OF AIRWAYS



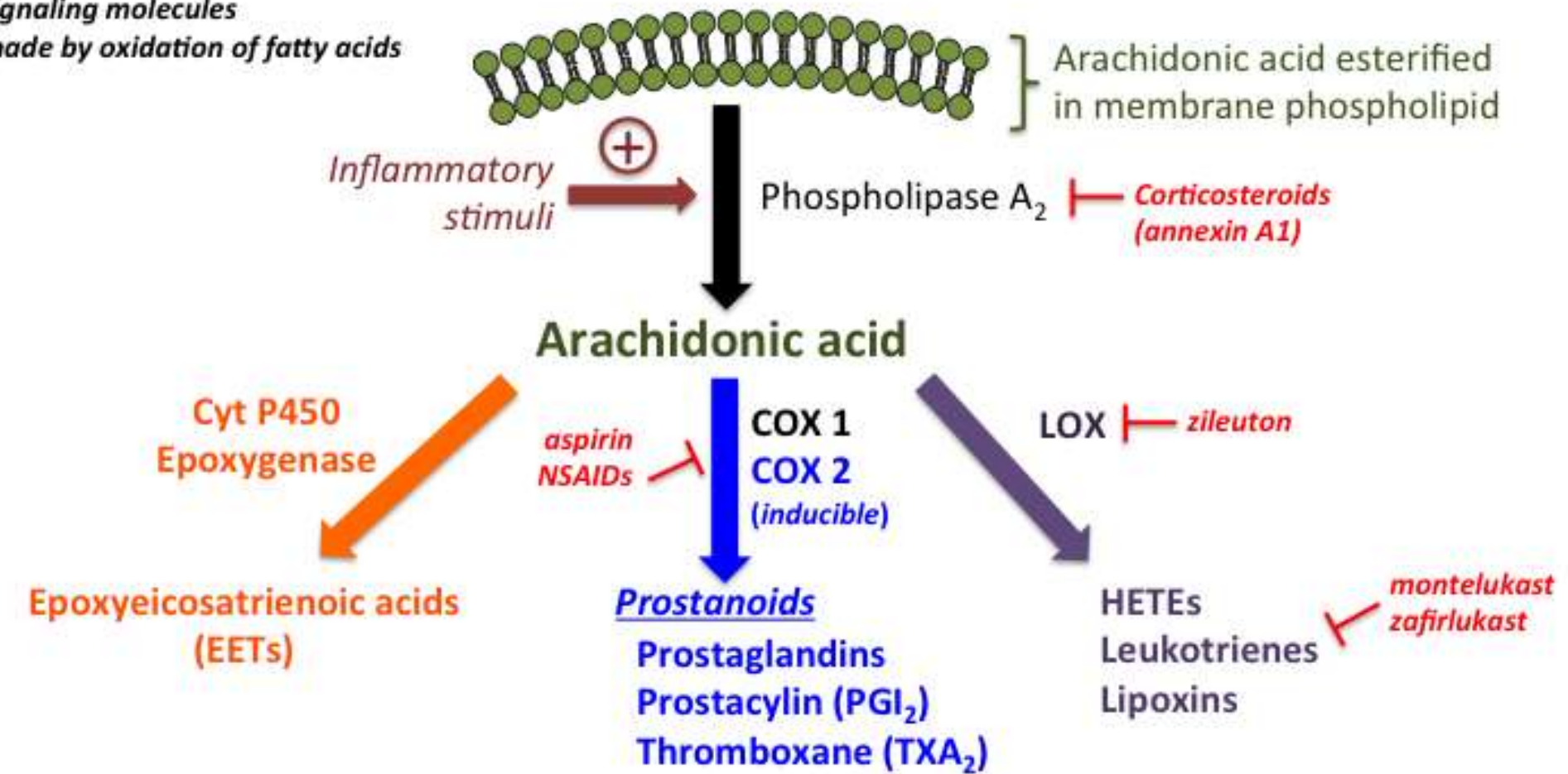
DRUG INDUCED ASTHMA



- Several pharmacologic agents provoke asthma
- Patients with aspirin sensitivity ----- > asthma
- The patient present with recurrent rhinitis, bronchospasm
- The precise mechanism is unknown

Eicosanoids

signaling molecules
made by oxidation of fatty acids

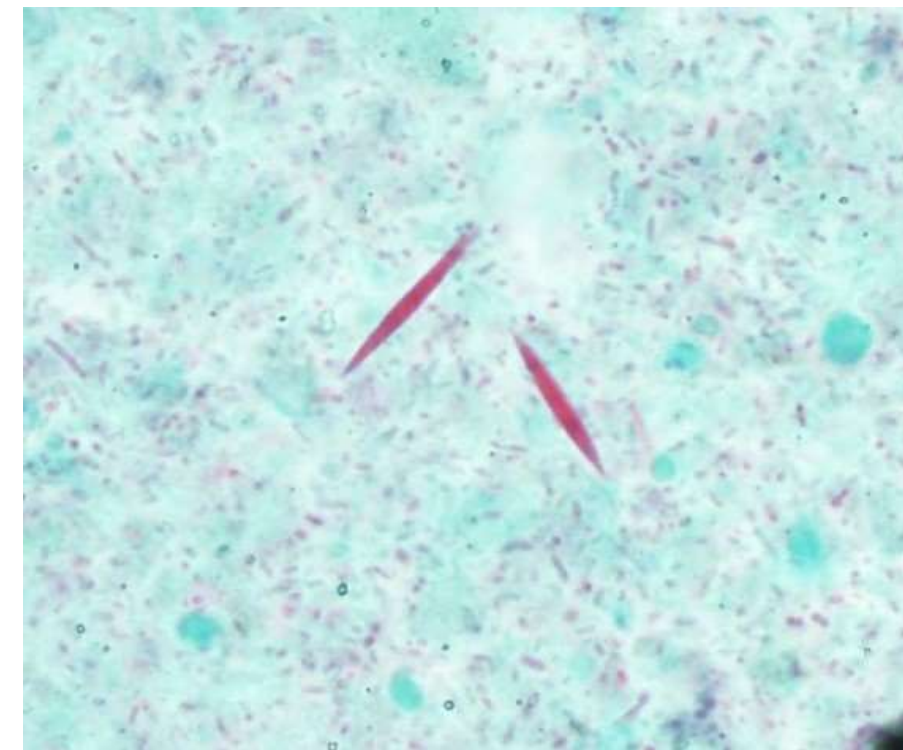




MORPHOLOGIC CHANGES



- The lungs are over-distended due to over-inflation
- occlusion of the bronchi and bronchioles by viscid mucus plugs
- Epithelium forming twisted strips called *Curschmann's spirals*
- The sputum usually contains numerous eosinophils and diamond-shaped crystals derived from eosinophils called *Charcot-Leyden crystals*.





DIAGNOSIS



- ***History and patterns of symptoms***
- Tightness of the chest, cough & expectoration, wheeze
- Comes in episodes, (recurrent)
- With exposure to allergens and irritants
- History of asthma attacks
- Relieve using salbutamol
- Allergy in skin, eyes, nose
- Family history of asthma or allergy
- ***Physical examination*** – Tachypnea
- ***Measurement of lung function*** – Spirometry



MEDICATIONS



Medications:

Bronchodilator – Helps to open the lungs to make the breathe easier

Steroid – modifies or simulates hormone effects, often to reduce inflammation or for tissue growth and repair

Anti-inflammatory – prevents or counteracts swelling (inflammation) in joints and tissues

