



# ASTHMA

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# DEFINITION

Asthma is a common and chronic inflammatory condition of the airways whose cause is not completely understood.

In Greek, Asthma means ‘laboured breathing’.

The national UK guidelines (BTS/SIGN, 2009) define asthma as ‘a chronic inflammatory disorder of the airways which occurs in susceptible individuals; inflammatory symptoms are usually associated with widespread but variable airflow obstruction and an increase in airway response to a variety of stimuli. Obstruction is often reversible either spontaneously or with treatment’.

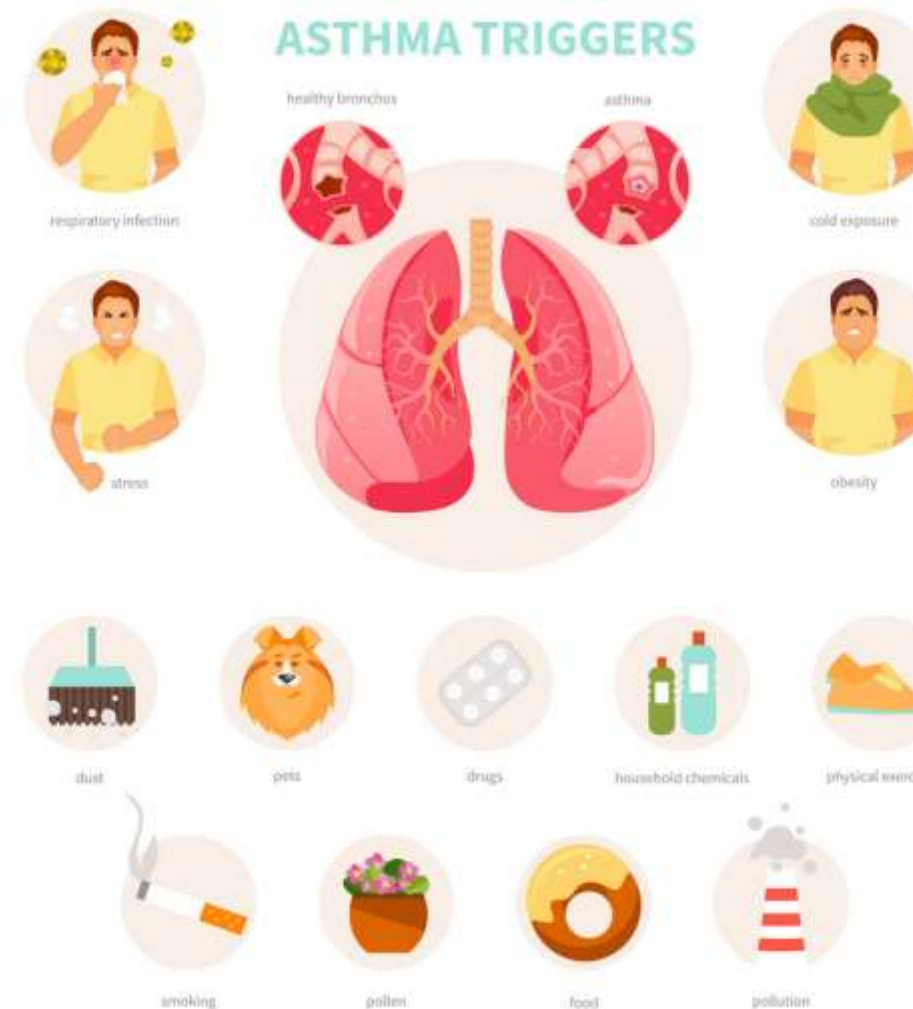
# ETIOLOGY

- The two main causes of asthma symptoms are airway hyper responsiveness and bronchoconstriction.
- Hyper responsiveness is an increased tendency of the airway to react to stimuli or triggers to cause an asthma attack.
- Bronchoconstriction is a narrowing of the airways that causes airflow obstruction.



# Possible trigger factors

- Allergens - Pollens, moulds, house dust mite, animals (dander, saliva and urine)
- Industrial chemicals - Isocyanate-containing paints, epoxy resins, aluminium, hair sprays
- Drugs - Aspirin, ibuprofen and other prostaglandin synthetase inhibitors,  $\beta$ -adrenoceptor blockers, penicillins and cimetidine



- Foods - A rare cause but examples include nuts, fish, seafood, dairy products, food colouring, especially tartrazine, benzoic acid and sodium metabisulfite
- Environmental pollutants-Traffic fumes. cigarette smoke, Sulphur dioxide
- Other industrial triggers-Wood or grain dust, colophony in solder, cotton, dust, grain weevils and mites
- Miscellaneous - Cold air, exercise, hyperventilation, viral respiratory tract infections, emotion or stress, swimming pool chlorine



# TYPES OF ASTHMA

Based on the stimuli initiating asthma, it is classified as,

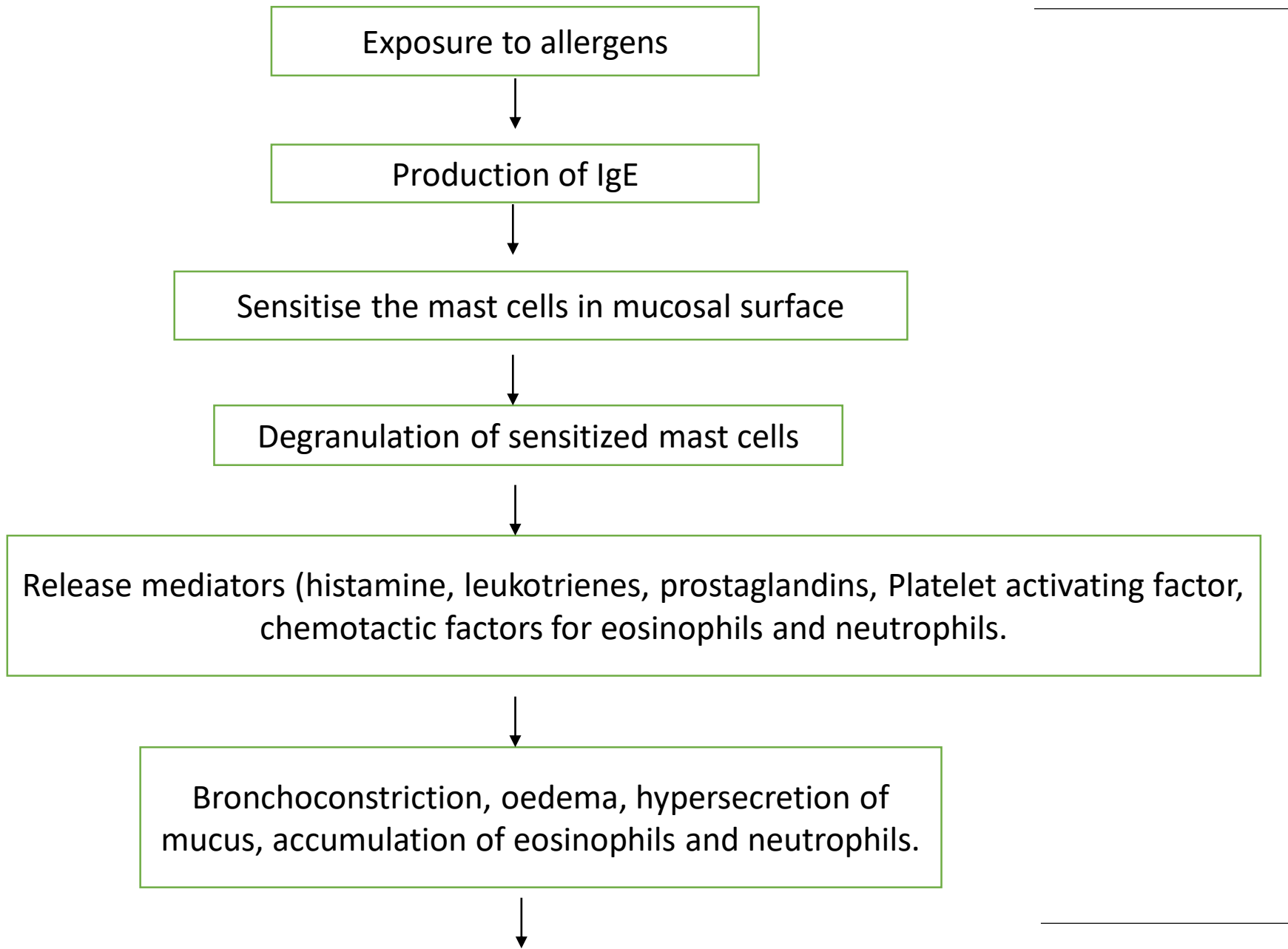
- **Extrinsic** (allergic, atopic)
- **Intrinsic** (idiosyncratic, non-atopic) asthma.
- **Mixed pattern** (the features do not fit clearly into either of the two main types).

# PATHOPHYSIOLOGY

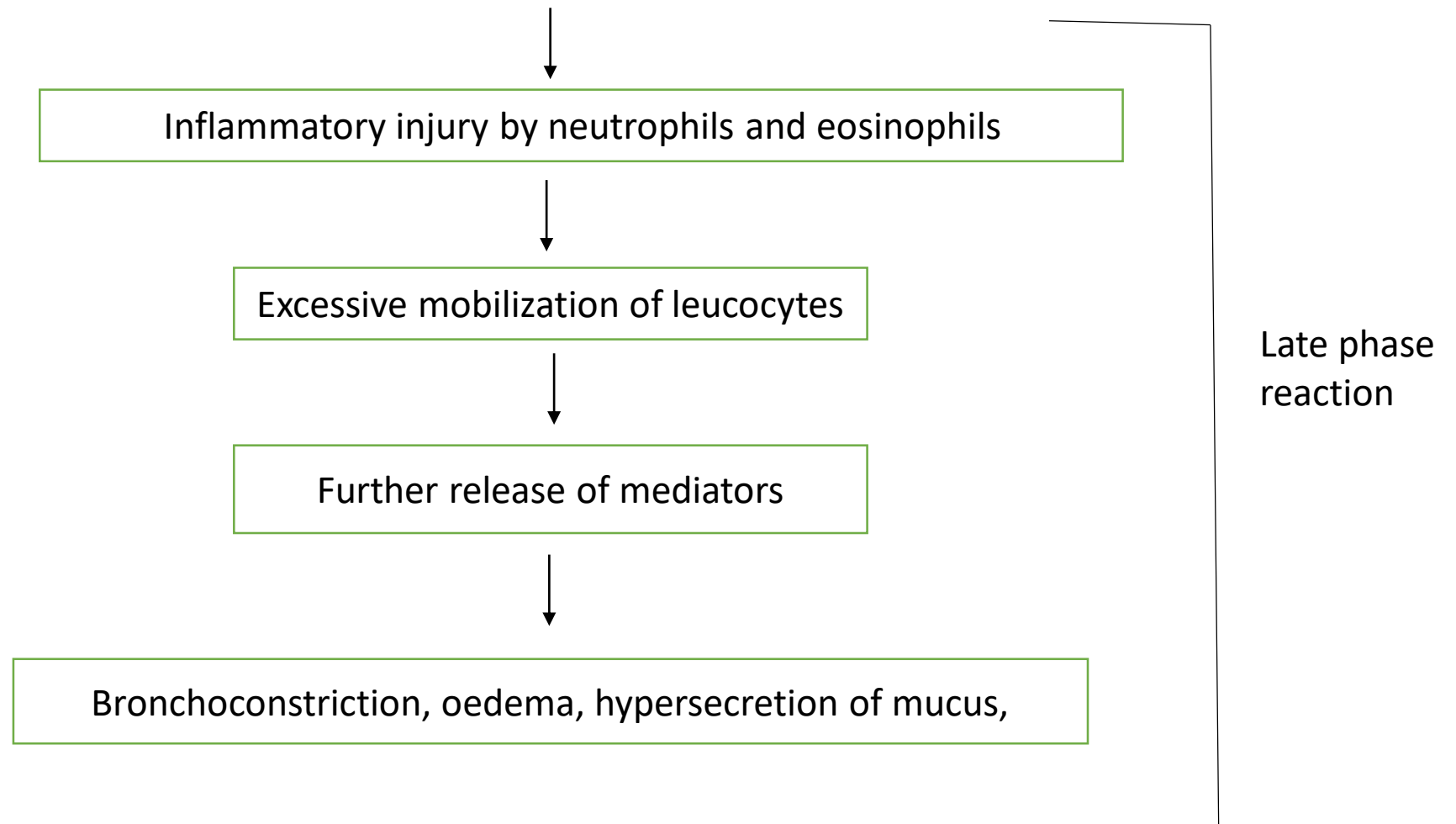
## **Extrinsic asthma**

- ❖ 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 or infantile eczema.
- ❖ Hypersensitivity to various extrinsic antigenic substances or ‘allergens’ is usually present in these cases.





Acute  
immediate  
response



Late phase reaction is responsible for the prolonged manifestations of asthma.

## **Intrinsic asthma**

- This type of asthma develops later in adult life with negative personal or family history of allergy, negative skin test and normal serum levels of IgE.
- Most of these patients develop typical symptom-complex after an upper respiratory tract infection by viruses.
- Associated nasal polypi and chronic bronchitis are commonly present.
- There are no recognisable allergens but about 10% of patients become hypersensitive to drugs, most notably to small doses of aspirin (aspirin-sensitive asthma).

## **Mixed type.**

- ❖ Many patients do not clearly fit into either of the above two categories and have mixed features of both.
- ❖ Those patients who develop asthma in early life have strong allergic component, while those who develop the disease late tend to be non-allergic.
- ❖ Either type of asthma can be precipitated by cold, exercise and emotional stress.

# CLINICAL MANIFESTATIONS

## Common signs and symptoms

- Wheezing (a high-pitched noise due to turbulent airflow through a narrowed airway).
- Chest Tightness (described as having a heavy weight on the chest. It may feel like a dull ache, or a sharp stabbing in the chest)
- Dyspnea (Difficulty Breathing)
- Shortness of Breath

Symptoms of asthma are often intermittent, and the frequency and severity of an episode can vary from individual to individual.



## Other signs and symptoms

- Blue Lips or Fingernails
- Chest Pain
- Cough (especially at night, during exercise or when laughing)
- Fatigue
- Rapid Breathing
- Trouble Sleeping

# RISK FACTORS



A number of factors increase the chances of developing asthma. These include:

- Family history
- Allergic condition (atopic dermatitis or allergic rhinitis )
- Obesity
- Smoking habit
- Air pollution
- Exposure to occupational triggers (certain dusts, molds, fumes, etc.,)



# DIAGNOSIS

- The FEV1 is usually decreased, the FVC normal or slightly reduced and the FEV1/FVC ratio decreased, usually  $<0.7$ .
- The diagnosis of asthma can be confirmed by measuring the response to a bronchodilator or by examining a patient's day-to-day variation in PEF readings.
- A diurnal variability of 60 L/min (or more than 20%) is highly suggestive of asthma.
- However, individuals may not have airflow obstruction at the time of the test, so the absence of an improvement does not rule out asthma. In this situation, peak flow readings can be done at home with repeated pre- and post bronchodilator readings taken at various times of the day. (GINA GUIDELINES)