

## 16. ASTHMA

**!! JAY AMBE !!**

## 16. ASTHMA

PREPARED BY

**DR. NAITIK D. TRIVEDI,**

**M. PHARM, PH. D**

LECTURER AT GOVERNMENT AIDED,

**A. R. COLLEGE OF PHARMACY & G. H. PATEL INSTITUTE OF  
PHARMACY, VALLABH VIDYANAGAR, ANAND, GUJARAT**

Mobile: +91 - 9924567864

E-mail: [mastermindnaitik@gmail.com](mailto:mastermindnaitik@gmail.com)

**&**

**DR. UPAMA N. TRIVEDI,**

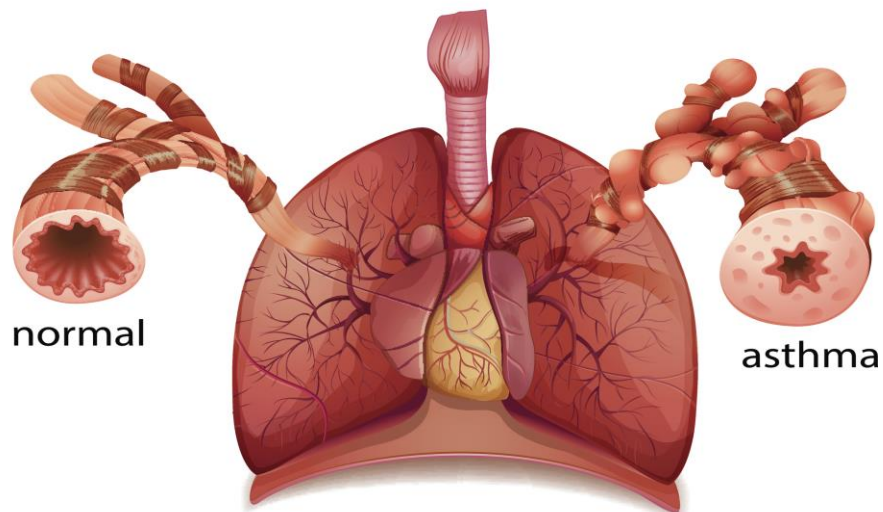
**M. PHARM, PH. D**

ASSOCIATE PROFESSOR & HoD (Pharm. D),

**INDUBHAI PATEL COLLEGE OF PHARMACY AND  
RESEARCH CENTRE, DHARMAJ, GUJARAT**

E-mail: [ups.aasthu@gmail.com](mailto:ups.aasthu@gmail.com)

### **Asthma - Inflamed Bronchial Tube**

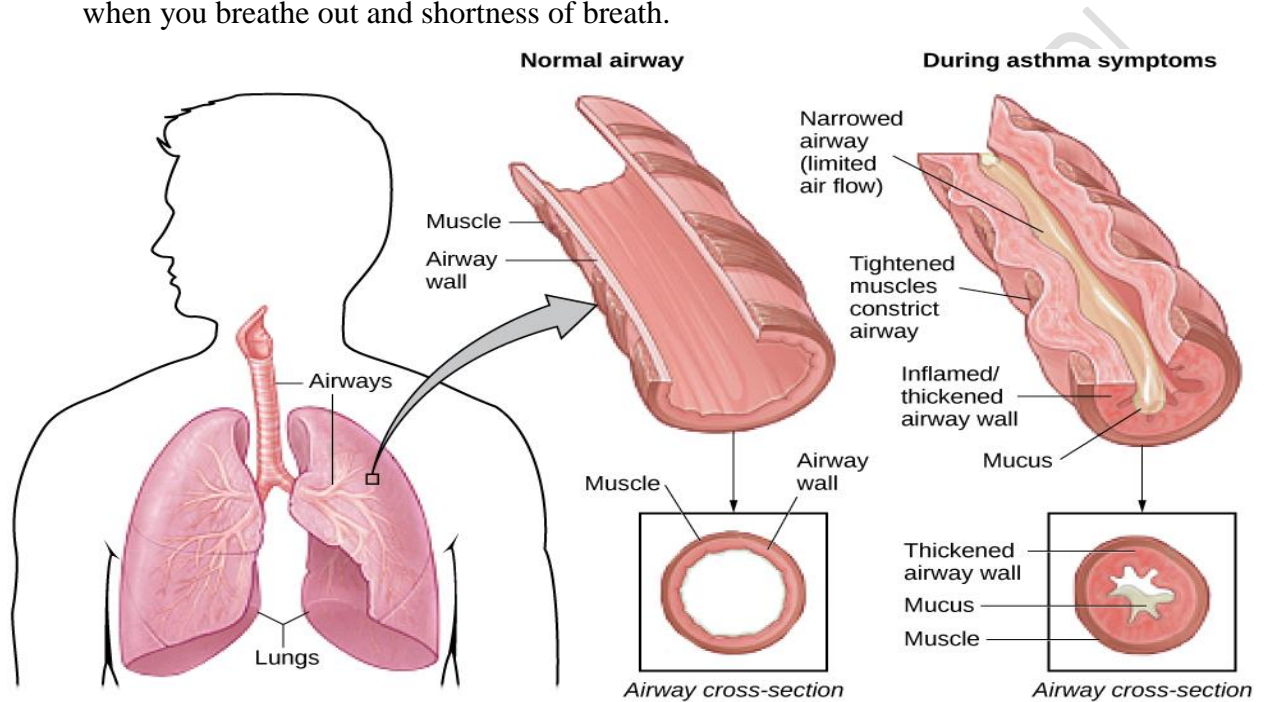


## 16. ASTHMA

### DEFINATION OF ASTHMA

**Asthma is a chronic disease involving the airways in the lungs.**

- ❖ Asthma is a condition in which your airways narrow and swell and may produce extra mucus.
- ❖ This can make breathing difficult and trigger coughing, a whistling sound (wheezing) when you breathe out and shortness of breath.



### KEY FACTS

- ❖ Asthma is one of the major noncommunicable diseases. It is a chronic disease of the air passages of the lungs which inflames and narrows them.
- ❖ It was estimated that more than 339 million people had Asthma globally in 2016. It is a common disease among children.
- ❖ Most asthma-related deaths occur in low- and lower-middle income countries.
- ❖ According to WHO estimates, there were 417,918 deaths due to asthma at the global level and 24.8 million DALYS attributable to Asthma in in 2016.
- ❖ The strongest risk factors for developing asthma are inhaled substances and particles that may provoke allergic reactions or irritate the airways.
- ❖ Medication can control asthma. Avoiding asthma triggers can also reduce the severity of asthma.

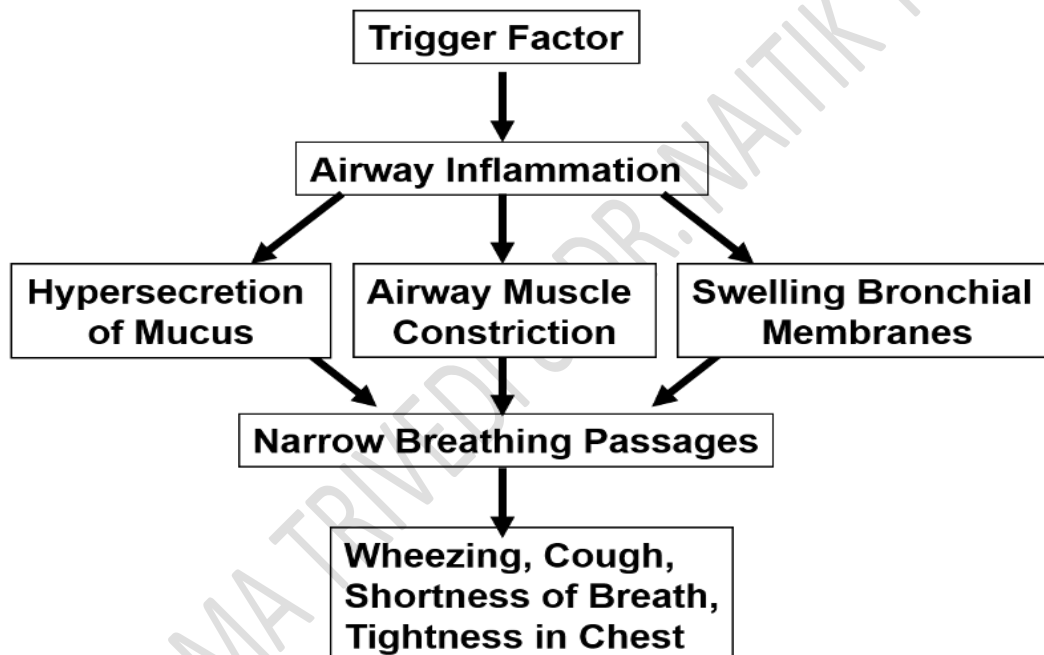
## 16. ASTHMA

### SYMPTOMS

The most common symptom of asthma is wheezing, a squealing or whistling sound made when you breathe.

Other asthma symptoms may include:

- ❖ coughing, especially at night, when laughing, or during exercise
- ❖ tightness in the chest
- ❖ shortness of breath
- ❖ difficulty talking
- ❖ anxiousness or panic
- ❖ fatigue



### ETIOLOGY:-

- ❖ Allergens (like pollen, dust mite, food etc.)
- ❖ Occupational exposure (eg. Chemical irritant, flour, etc.)
- ❖ Respiratory tract infection
- ❖ Exercise
- ❖ Emotions (like, anxiety, stress, hard laughter or crying)
- ❖ Exposure to irritants (like strong odors, chemical, fumes)
- ❖ Environmental exposure (weather change, cold air, cigarette smoke)
- ❖ Drugs eg. Drug which induces the hypersensitivity reaction.

## 16. ASTHMA

### CLASSIFICATION:-

According to severity, asthma is classified by national institute of health as:

SR. NO.	TYPE	CHARACTERISTICS
1.	Intermittent	Most people have this type of asthma, which doesn't interfere with daily activities. Symptoms are mild, lasting fewer than two days per week or two nights per month.
2.	Mild persistent	The symptoms occur more than twice a week — but not daily — and up to four nights per month.
3.	Moderate persistent	The symptoms occur daily and at least one night every week, but not nightly. They may limit some daily activities.
4.	Severe persistent	The symptoms occur several times every day and most nights. Daily activities are extremely limited.

### TYPES OF ASTHMA

#### 1. Allergic asthma (extrinsic asthma/Seasonal asthma)

Allergens trigger this common type of asthma. These might include:

- ❖ Pet dander from animals like cats and dogs
- ❖ Food
- ❖ Mold
- ❖ Pollen
- ❖ Dust

Allergic asthma is often seasonal because it often goes hand-in-hand with seasonal allergies.

#### 2. Nonallergic asthma (intrinsic asthma)

Irritants in the air not related to allergies trigger this type of asthma. These irritants might include:

- ❖ Burning wood
- ❖ Cigarette smoke
- ❖ Cold air
- ❖ Air pollution
- ❖ Viral illnesses

## 16. ASTHMA

- ❖ Air fresheners
- ❖ Household cleaning products
- ❖ Perfumes

### 3. Occupational asthma

Occupational asthma is a type of asthma induced by triggers in the workplace. These include:

- ❖ Dust
- ❖ Dyes
- ❖ Gases and fumes
- ❖ Industrial chemicals
- ❖ Animal proteins
- ❖ Rubber latex

These irritants can exist in a wide range of industries, including:

- ✓ Farming
- ✓ Textiles
- ✓ Woodworking
- ✓ Manufacturing

### 4. Exercise-induced bronchoconstriction (EIB)

- ❖ Exercise-induced bronchoconstriction (EIB) usually affects people within a few minutes of starting exercise and up to 10–15 minutes after physical activity.
- ❖ This condition was previously known as exercise-induced asthma (EIA).
- ❖ Up to 90 percent of people with asthma also experience EIB, but not everyone with EIB will have other types of asthma.

### 5. Aspirin-induced asthma

- ❖ Aspirin-induced asthma (AIA), also called aspirin-exacerbated respiratory disease (AERD), is usually severe.
- ❖ It's triggered by taking aspirin or another NSAID (nonsteroidal anti-inflammatory drug), such as naproxen (Aleve) or ibuprofen (Advil).
- ❖ The symptoms may begin within minutes or hours. These patients also typically have nasal polyps.

## 16. ASTHMA

### 6. Nocturnal asthma

In this type of asthma, symptoms worsen at night.

Triggers that are thought to bring on symptoms at night include:

- ❖ Heartburn
- ❖ Pet dander
- ❖ Dust mites

The body's natural sleep cycle may also trigger nocturnal asthma.

### 7. Cough-variant asthma (CVA)

- ❖ Cough-variant asthma (CVA) doesn't have classic asthma symptoms of wheezing and shortness of breath. It's characterized by a persistent, dry cough.
- ❖ If it's not treated, CVA can lead to full-blown asthma flares that include the other more common symptoms.

## PATHOPHYSIOLOGY

### Major Contributing Processes

#### 1. **Airway obstruction:-**

- ✓ Mainly due to bronchoconstriction, airway wall edema, mucus plug formation, smooth muscle cell hypertrophy and hyperplasia etc.

#### 2. **Airways hypersensitivity**

- ✓ It's an exaggerated response to certain stimuli like virus, drugs, environmental factors, allergen etc. which results in to increase in a level of inflammatory mediators which results in to airway obstruction and causes asthma.

#### 3. **Airway inflammation:-**

- ✓ It's a crucial to development of asthma. It occurs due mainly to the activation of the inflammatory cells like mast cell, T-cell, macrophages, eosinophil, and etc. which secretes the inflammatory mediators and influences the airway directly.

#### 4. **Airway remodeling:-**

- ✓ It can result from persistent inflammation. The resulting damage can yield permanent airway abnormality because of sub-basement membrane collagen deposition and fibrosis.

## 16. ASTHMA

### **There Are Several Events That Are Occur In Asthma:**

#### **1. Triggering:-**

- ✓ Various triggers such as antigen or other non allergic factor like drug, viral infection etc. may lead to either early asthmatic response or late asthmatic response.

#### **2. Signaling:-**

- ✓ The activated mast cell and other signaling cell like lymphocytes, eosinophils, epithelial cell etc. release the chemical signals like cytokines, chemokines, eicosanoids, leucotrienes etc. which attracts additional inflammatory cells to the airway.

#### **3. Cell Activation:-**

- ✓ It is required before cells can release the inflammatory mediators.
- ✓ Leucotrienes appears to be important for this cell activation.
- ✓ Leucotrienes causes smooth muscle contraction and set the stage for the late phase of inflammatory process by initiating chemotaxis.
- ✓ Other mediators like chemotactic factor of eosinophil, basophil, neutrophil, and platelet activating factor etc. are participate in the late asthmatic response by recruiting additional inflammatory cells to the airway.

#### **4. Tissue Stimulation and Damage:-**

- ✓ It occurs as a result of this all inflammatory mediators released from activated cell.
- ✓ The epithelial damage is believed to contribute to airway hyper responsiveness rather than resolving, airway inflammation may persistent and results in structural change to the lung known as airway remodeling.

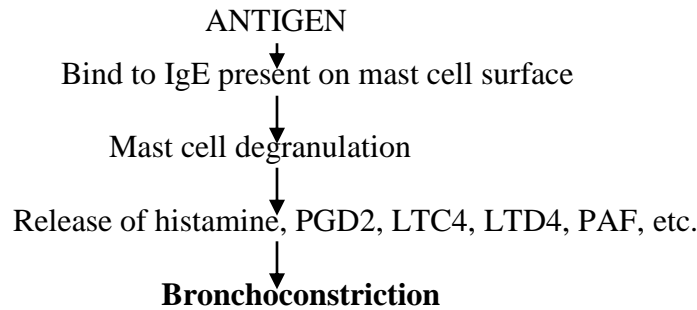
### **THE EFFECT OF ALL ABOVE MECHANISM WILL RESULTS IN EITHER**

1. Early or phase of asthmatic response
2. Late phase of asthmatic response.

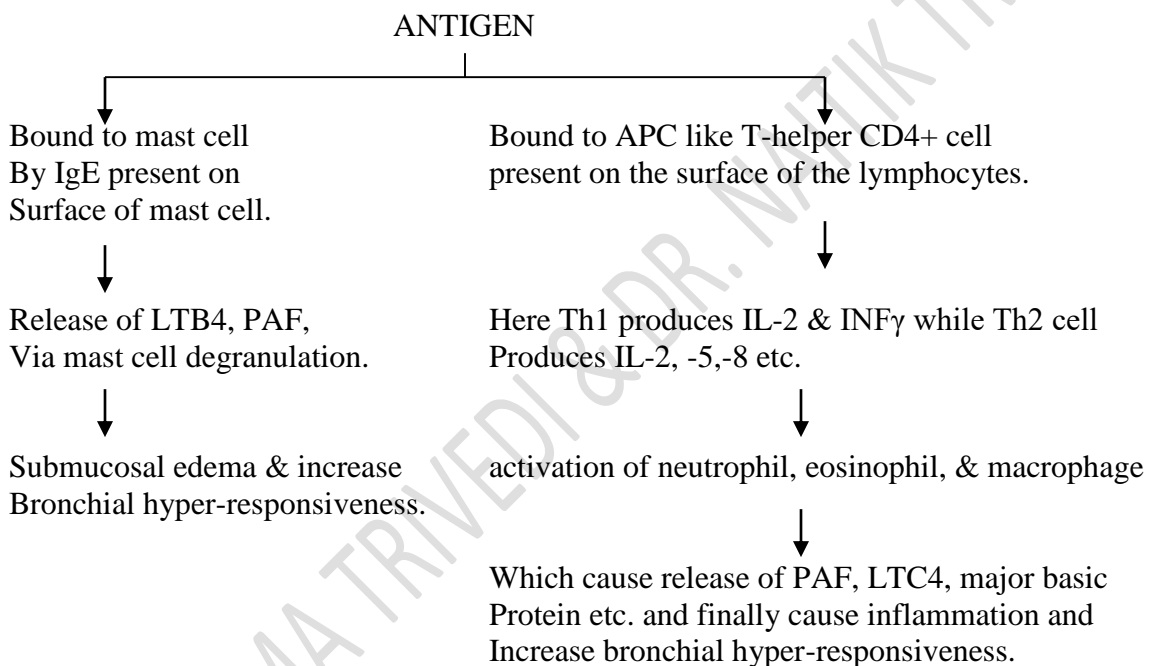
**It may be results in to chronic asthma.**

## 16. ASTHMA

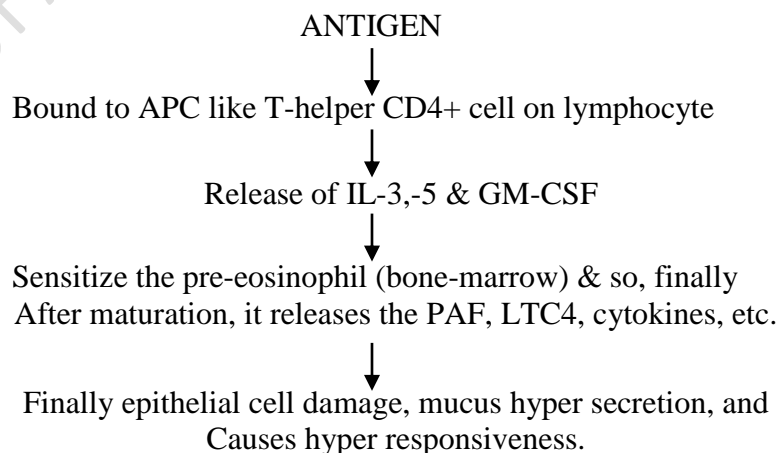
### 1). EARLY ASTHMATIC RESPONSE:- (Seen within a minutes.)



### 2). LATE ASTHMATIC RESPONSE:- (Seen within an hrs.)



### 3) CHRONIC ASTHMA:-(response are seen even after days)





## 16. ASTHMA

