

Drugs for COPD and Asthma

By:

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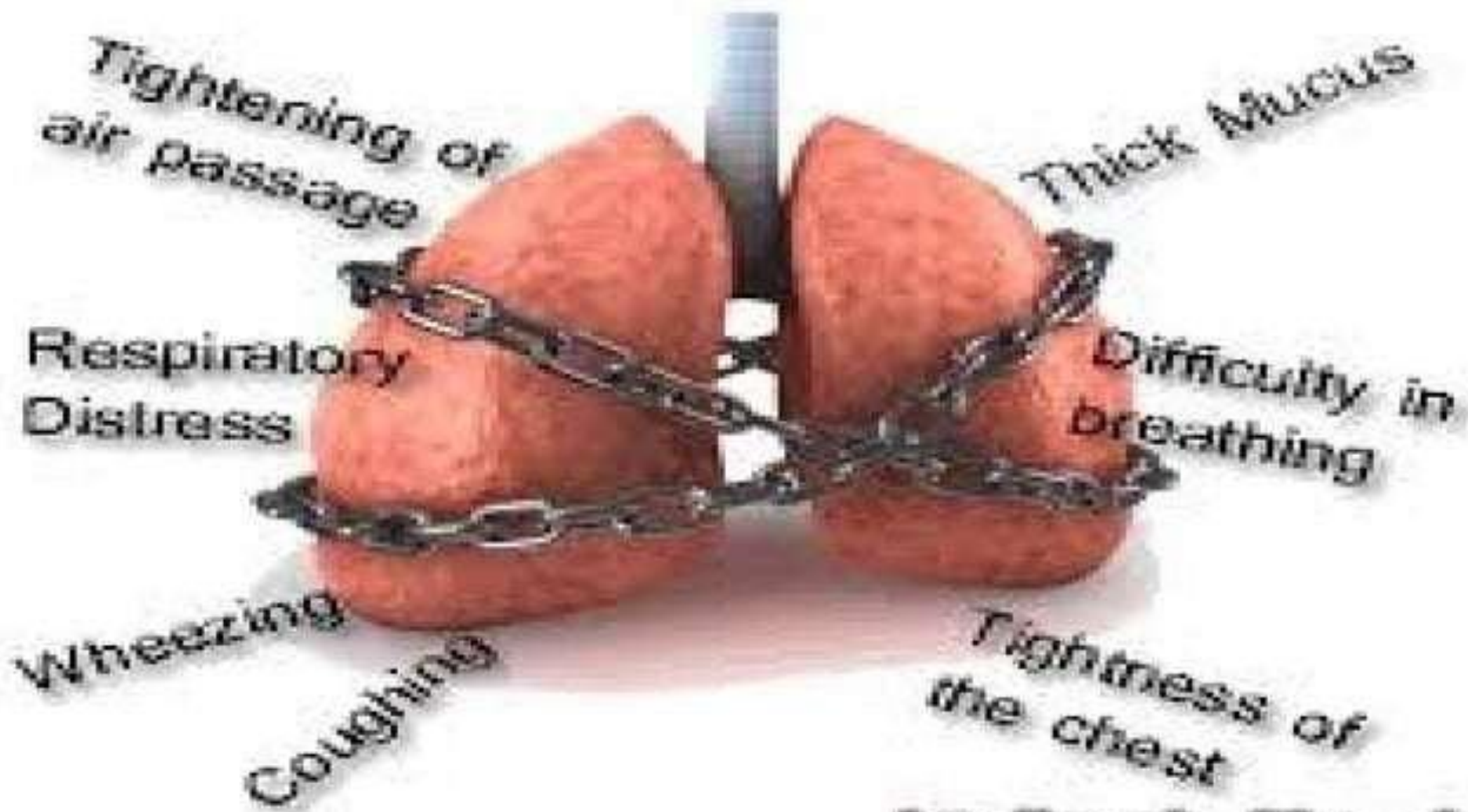
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Definition of Asthma

- Asthma is a chronic disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person. During an asthma attack, the lining of the bronchial tubes swells, causing the airways to narrow and reducing the flow of air into and out of the lungs.
- Asthma is one of the major noncommunicable diseases. It is a chronic disease of the the air passages of the lungs which inflames and narrows them.

What is Asthma



Symptoms

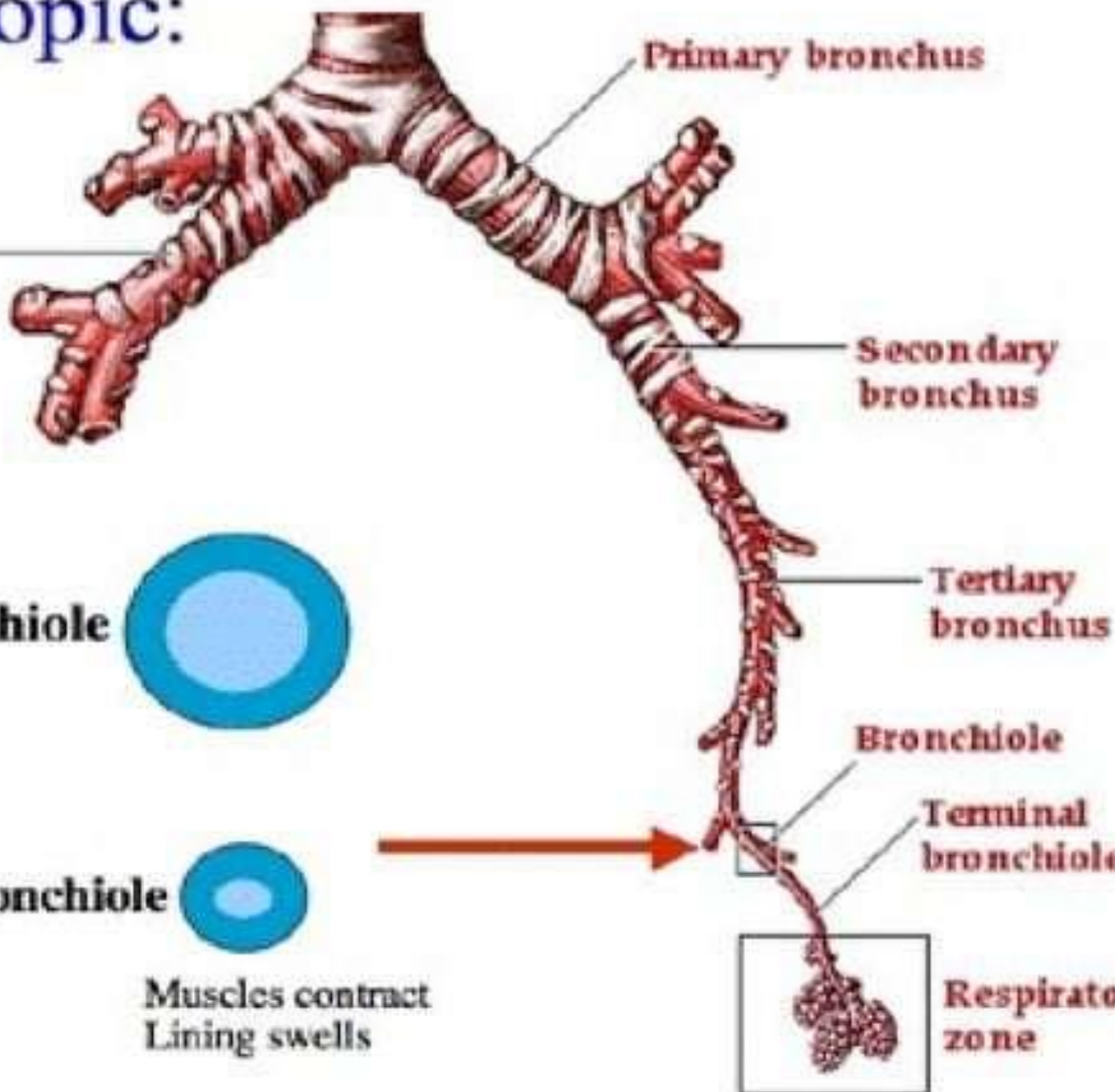
- ❖ Symptoms may occur several times in a day or week in affected individuals, and for some people become worse during physical activity or at night
- ❖ WHO estimates that 235 million people currently suffer from asthma. Asthma is the most common noncommunicable disease among children.

Normal bronchiole

Asthmatic bronchiole

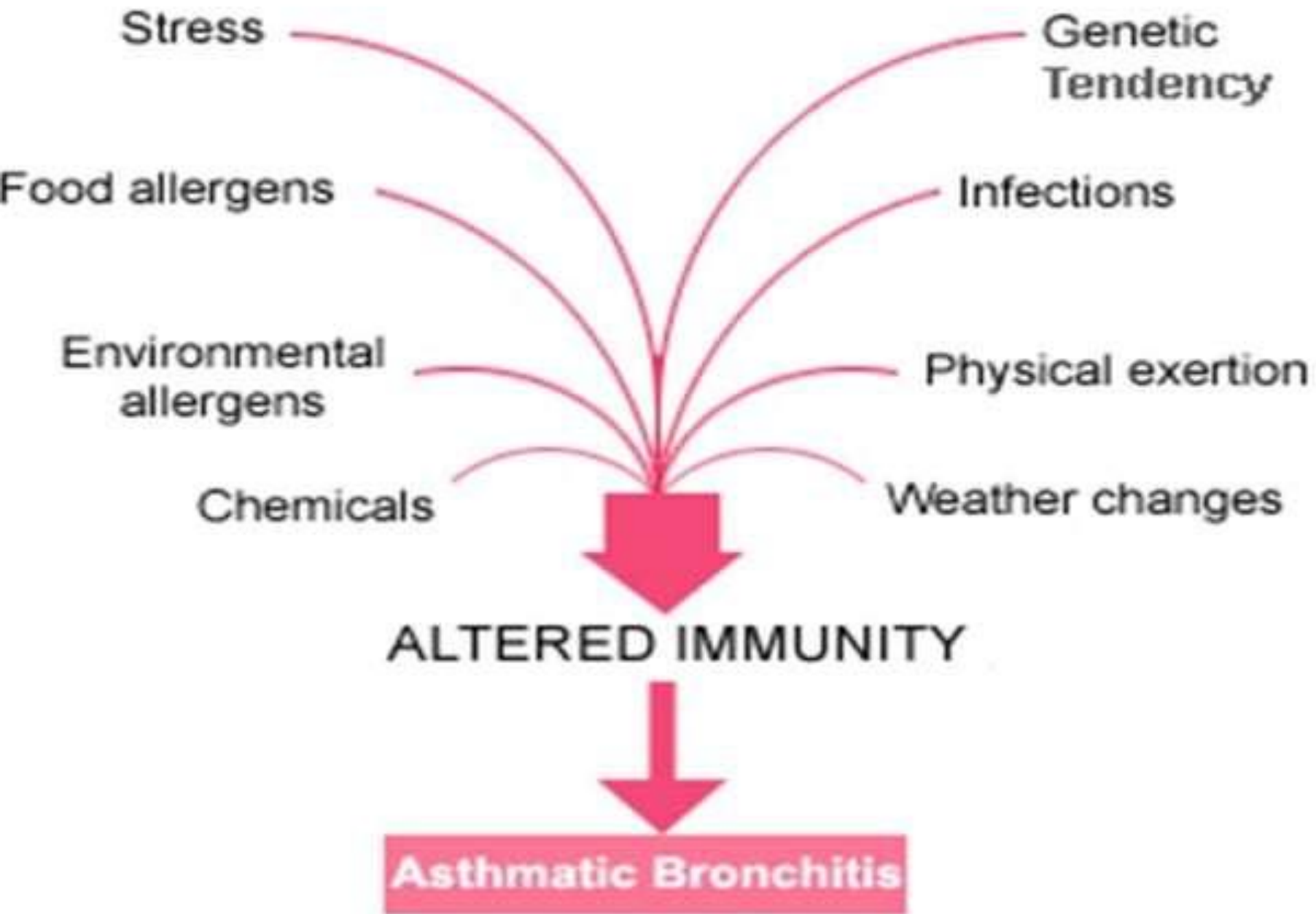


Special Topic: Asthma



Causes:

- The fundamental causes of asthma are not completely understood. The strongest risk factors for developing asthma are a combination of genetic predisposition with environmental exposure to inhaled substances and particles that may provoke allergic reactions or irritate the airways, such as:
- indoor allergens (for example, house dust mites in bedding, carpets and stuffed furniture)
- Outdoor allergens (such as pollens and pollution and pet dander, moulds)
- Tobacco smoke
- Chemical irritants in the workplace
- Air pollution.
- Other triggers can include cold air, extreme emotional arousal such as anger or fear, and physical exercise.



Reducing the asthma burden

- Although asthma cannot be cured, appropriate management can control the disease and enable people to enjoy a good quality of life. Short-term medications are used to relieve symptoms.
- Medications such as long-term inhaled steroids are needed to control the progression of severe asthma.
- People with persistent symptoms must take long-term medication daily to control the underlying inflammation and prevent symptoms and exacerbations

Asthma Treatment

Allergy & Asthma Network
Pathways of Distinction
www.aanet.org

Asthma Inhalers

Updated 11/2011

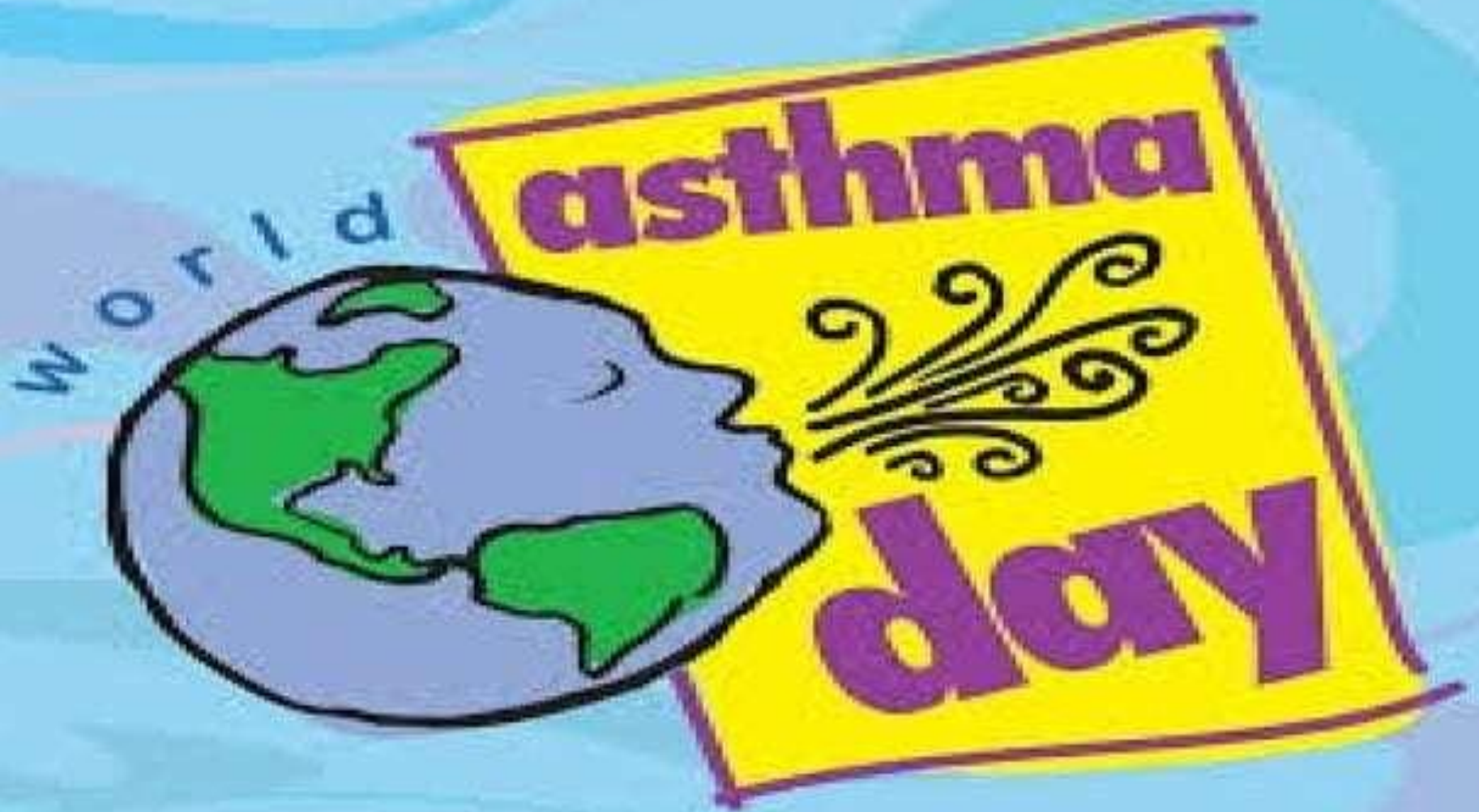
The infographic is a semi-circular diagram divided into three main sections, each containing images of various inhaler devices and their associated medications. The top section, 'Inhaled Bronchodilators', shows several different colored inhalers. The middle section, 'Inhaled Anti-Inflammatories', features a variety of inhaler types, including some with circular mouthpieces. The bottom section, 'Combination Medications', displays inhalers with multiple colored components. The entire diagram is set against a light background with a curved border.

Inhaled Bronchodilators

Inhaled Anti-Inflammatories

Combination Medications

ACAAI Astrobreca ExonMobil VMD



May 7th world asthma day

MANAGEMENT OF ASTHMA



A

◦ Adrenergics (Beta 2 Agonists)
(Albuterol)

S

◦ Steroids

T

◦ Theophylline

H

◦ Hydration (IV)

M

◦ Mask O₂

A

◦ Anticholinergics

Management of Asthma

1. “Relievers”

I. Short-acting bronchodilators

A. β_1 -adrenergic agents

B. Anti-cholinergic (Parasympatholytic) agents

2. “Controllers”

1. Corticosteroids

2. Long-Acting bronchodilators

I. β_1 -adrenergic agents

II. Methylxanthines

3. Mast cell stabilizers.

4. Leukotriene inhibitors

5. Anti-IgE monoclonal antibodies

Adrenergic Bronchodilators – Short-Acting Agents or sympathomimetics.

- Catecholamine

- Epinephrine
- Isoproterenol
- Isoetharine

- Resorcinol agents

- Metaproterenol

- Saligenin agents

Albuterol

Pirbuterol

Bitolterol

Anticholinergic (Parasympatholytic) Bronchodilators

- Tertiary Ammonium Compounds:
 - Atropine methonitrate.
 - Scopolamine
- Quaternary Ammonium Compounds:
 - Ipratropium bromide.
 - Tiotropium bromide

Controllers

- Corticosteroids
- Long-Acting bronchodilators
 - β_2 -adrenergic agents
 - Methylxanthines
- Cromolyn sodium/Nedrocromil
- Leukotriene inhibitors
- Anti-IgE monoclonal antibodies

Inhaled Glucocorticoids Examples

- Beclomethasone dipropionate: BECLATE INHALER 50 Ug.
 - Dosage: 200-1000µg BD.
- Budesonide: PULMICORT 100,200,400Ug/metered dose.
 - Dosage: 200-400µg BID –QID.
- Flunisolide
 - SYNTARIS 25 µg Per actuation nasal spray..
- Fluticasone : FLOMIST50 ug per actuation nasal spray.
 - 100-500µg(max-1000 ug)
- Triamcinolone acetonide
 - 400-2000µg

Adrenergic Bronchodilators – Long-Acting Agents

- albuterol
- Salmeterol
- Formoterol
- Salbutamol
- Terbutaline
- Bambuterol

Leukotriene modifiers

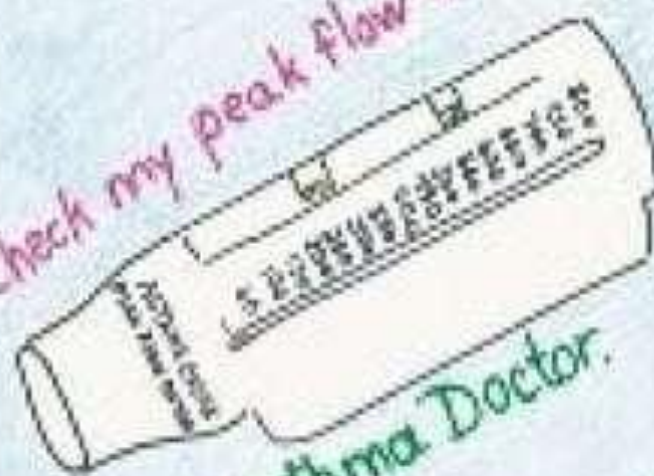
- A relatively new class of anti-asthma drugs that include cysteinyl leukotriene 1 (CysL T1) receptor antagonists.
- e.g. montelukast, zafirlukast
- 5-lipoxygenase inhibitor :
e.g. zileuton

Anti-IgE Antibodies

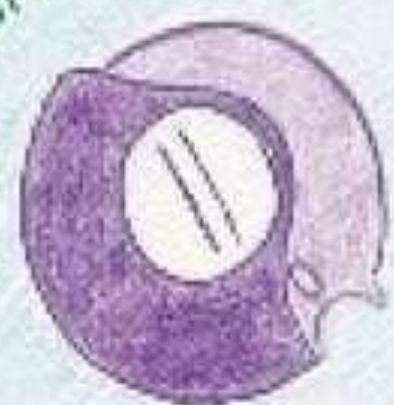
- Agents directed at diminishing the production of IgE through effects on interleukin 4 or on IgE itself have been evaluated
 - Recombinant human monoclonal antibody that forms complexes with free IgE blocks the interaction of IgE with mast cells and basophiles.
 - E.g. Omalizumab.

I CAN CONTROL MY ASTHMA

Check my peak flow meter.



Visit my asthma Doctor.



Take my inhalers



Avoid triggers



Take my meds



COPD

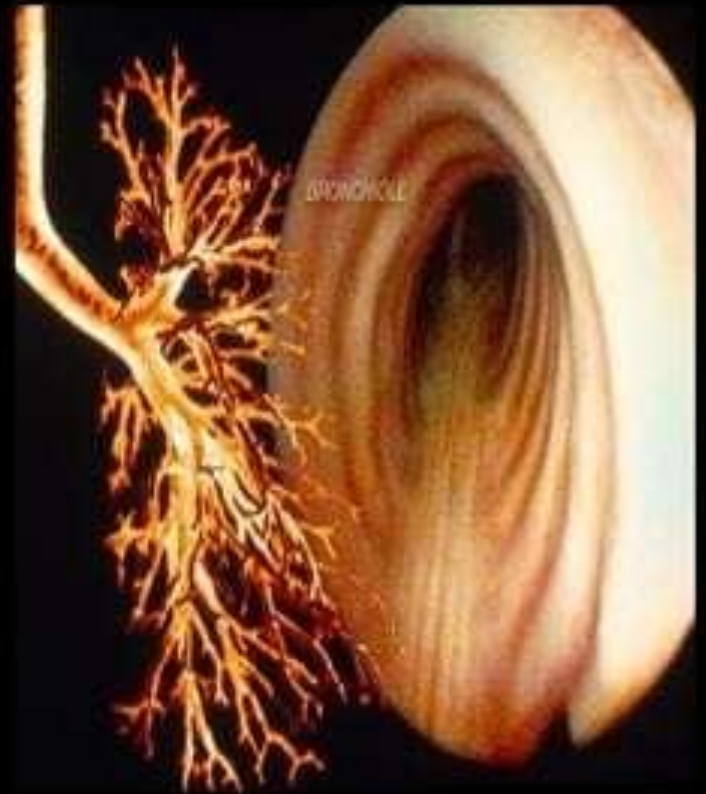
Chronic Obstructive
Pulmonary Disease



• A respiratory disease characterized by breathlessness brought on by the enlargement, or over-inflation of, the air sacs (alveoli) in the lungs

COPD:

- This condition is the main problem for some people with COPD. Its calling card is a nagging cough with plenty of mucus (phlegm). Inside the lungs, the small airways have swollen walls, constant oozing of mucus, and scarring. Trapped mucus can block airflow and become a breeding ground for germs. A "smoker's cough" is typically a sign of chronic bronchitis. The cough is often worse in the morning and in damp, cold weather.



Symptoms

The most common symptoms of COPD are

- breathlessness (or a "need for air").
- abnormal sputum (a mix of saliva and mucus in the airway).
- chronic cough.

Daily activities, such as walking up a short flight of stairs or carrying a suitcase, can become very difficult as the condition gradually worsens.

Main risk factors for COPD

- Tobacco smoking
- Indoor air pollution (such as biomass fuel used for cooking and heating)
- Outdoor air pollution
- Occupational dusts and chemicals (vapours, irritants, and fumes)

RESPIRATORY ACIDOSIS

- Hypoventilation → Hypoxia

- Rapid, Shallow Respirations

- ↓ BP with Vasodilation

- Dyspnea

- Headache

- Hyperkalemia

- Dysrhythmias (↑K)

I can't catch my breath.

- Drowsiness, Dizziness, Disorientation

- Muscle Weakness, Hyperreflexia

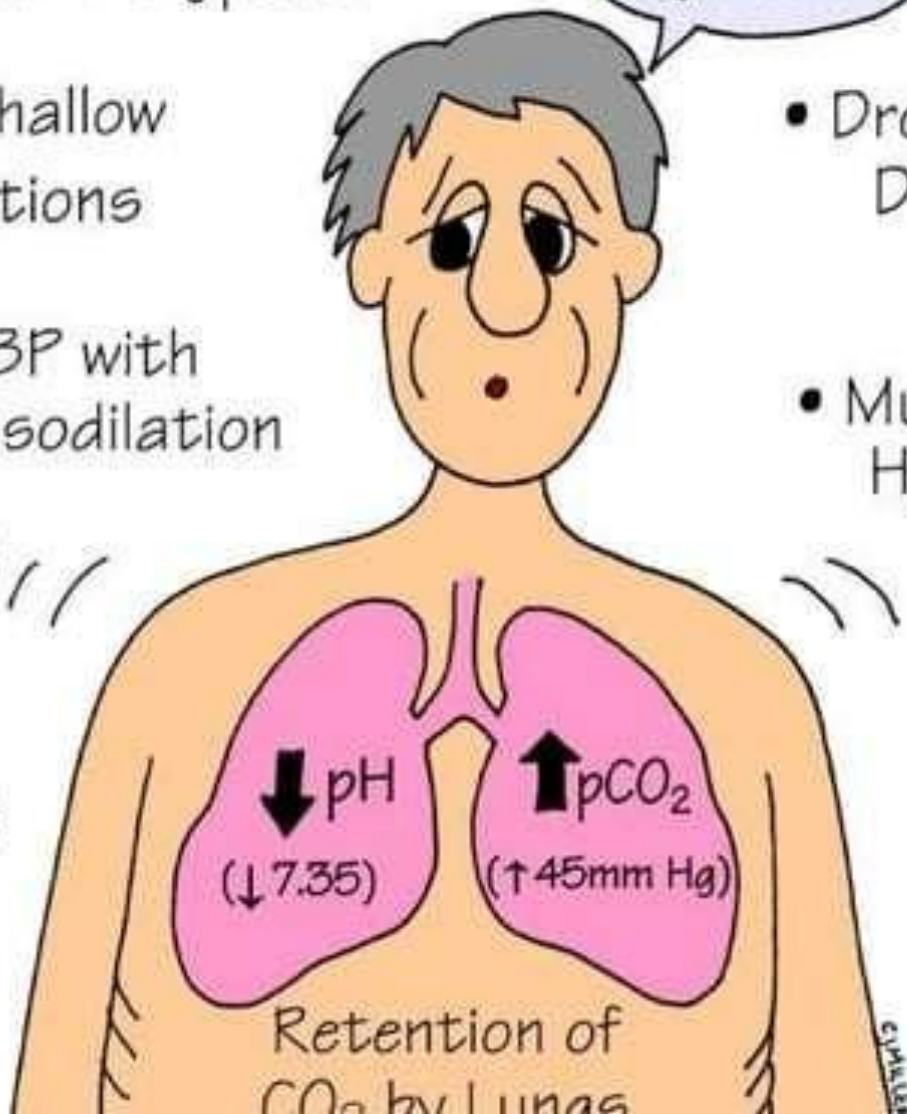
- Causes:

- ↓ Respiratory Stimuli (Anesthesia, Drug Overdose)

- COPD

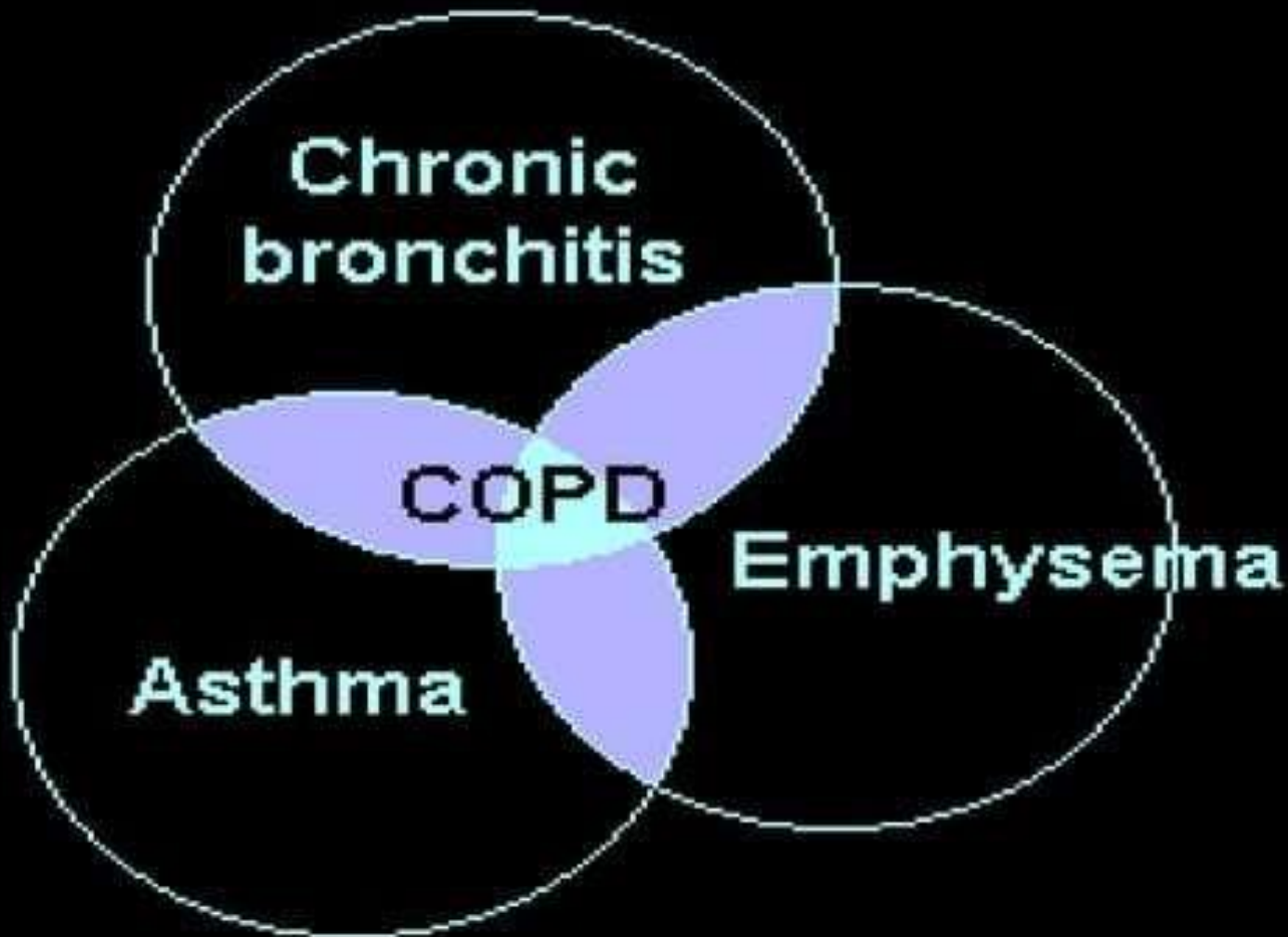
- Pneumonia

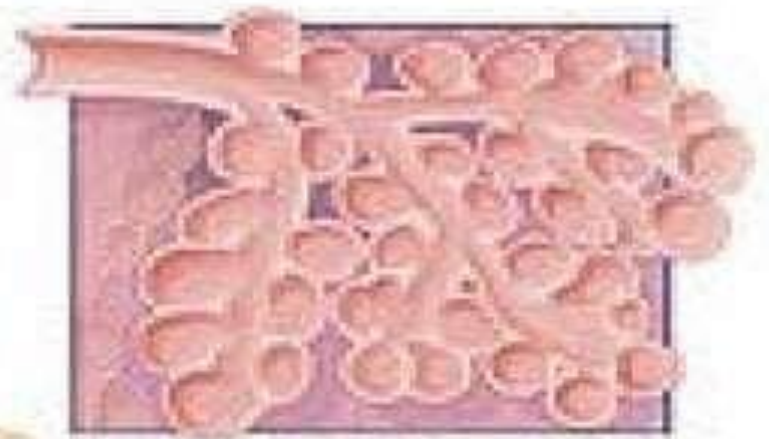
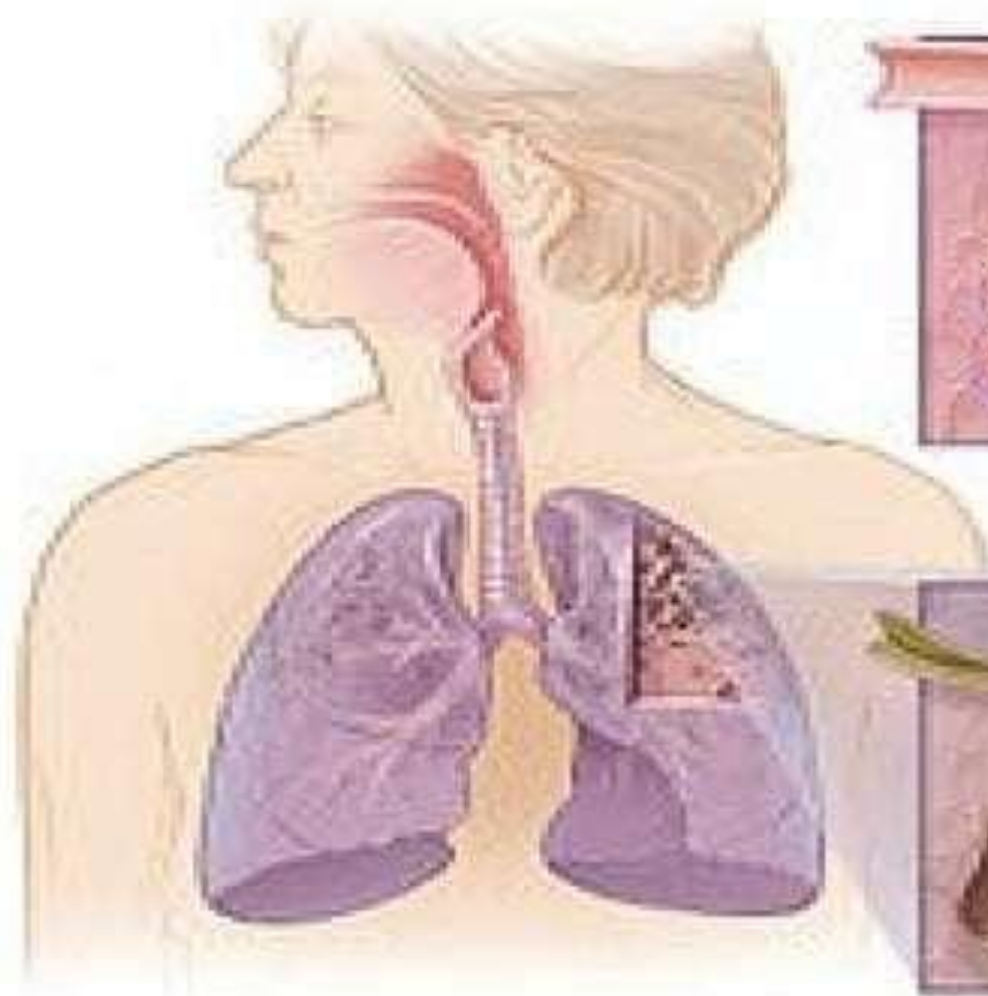
- Atelectasis



Retention of CO₂ by Lungs

CHAISE





HEALTHY



COPD

Drugs for COPD

- Bronchodilators –
 - Relaxes muscles around airways.
- Steroids
 - Reduces inflammation.
- Oxygen therapy
 - Helps with shortness of breath.

Management of COPD

- COPD **can be managed**, but not cured.
- Treatment is different for each individual and is based on severity of the symptoms
- Early diagnosis and treatment can
 - Slow progress of the disease
 - Relieve symptoms
 - Improve an individual's ability to stay active
 - Prevent and treat complications
 - Improve quality of life

Conclusion:

- Asthma and COPD are similar type of diseases which will cause an inflammation in lungs leads to severity upto death.
- COPD is the Group of Diseases which cannot be cured but can be managed. similarly Asthma can also managed but not cured.

Stages of COPD

COPD Stages I: Mild COPD

Stage 1

80% Normal Lung Function



COPD Stages II: Moderate COPD

Stage 2

50% - 80% Normal Lung Function



COPD Stages III: Severe COPD

COPD Stage III typically involves severe restraint of Respiration, tightness of breath and frequently COPD exacerbations.

Stage 3

30% - 50% Normal Lung Function



COPD Stages IV: Very Severe COPD

COPD Stage IV become very severe and risky, and, Thus decreases the life quality with vital COPD Exacerbations.

Lung function FEV1 levels might lower that than 30%.

Stage 4

Less Than 30% Normal Lung Function



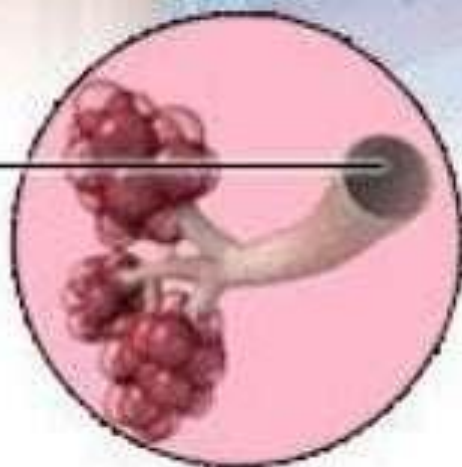
trachea

right lung

bronchus

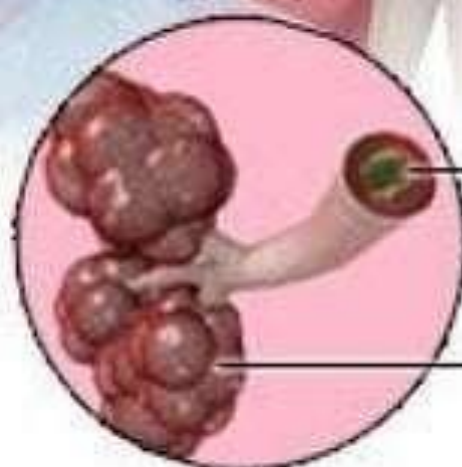


normal
bronchiole



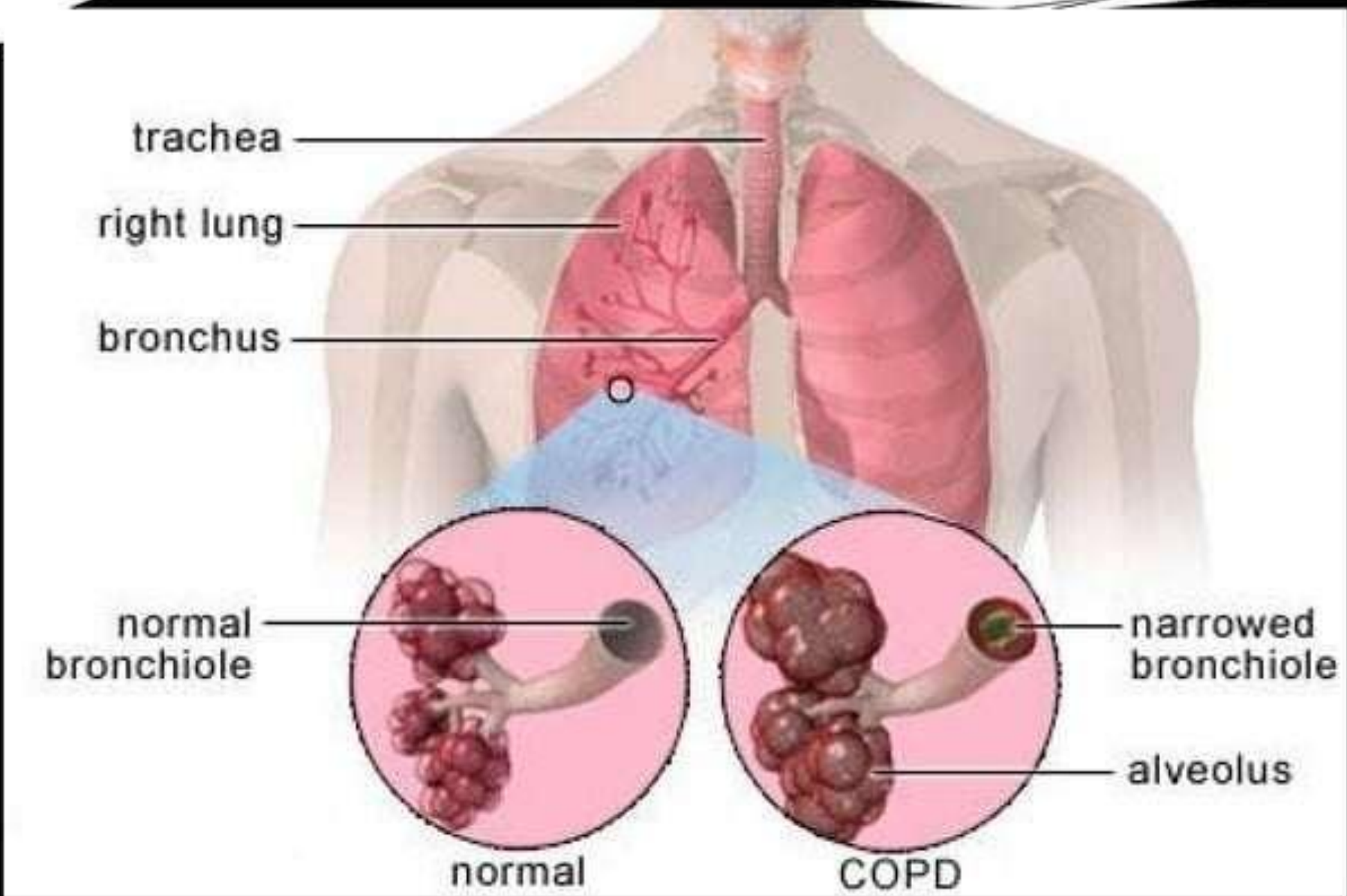
normal

narrowed
bronchiole



alveolus

COPD



REFERENCES:

- Essentials of Pharmacology By K.D. Tripathi
- Lippincotts Illustrated Review 5th edition
- Phamacology By Rang and Dale.