Chronic obstructive pulmonary disease (COPD)

PRESENTED BY

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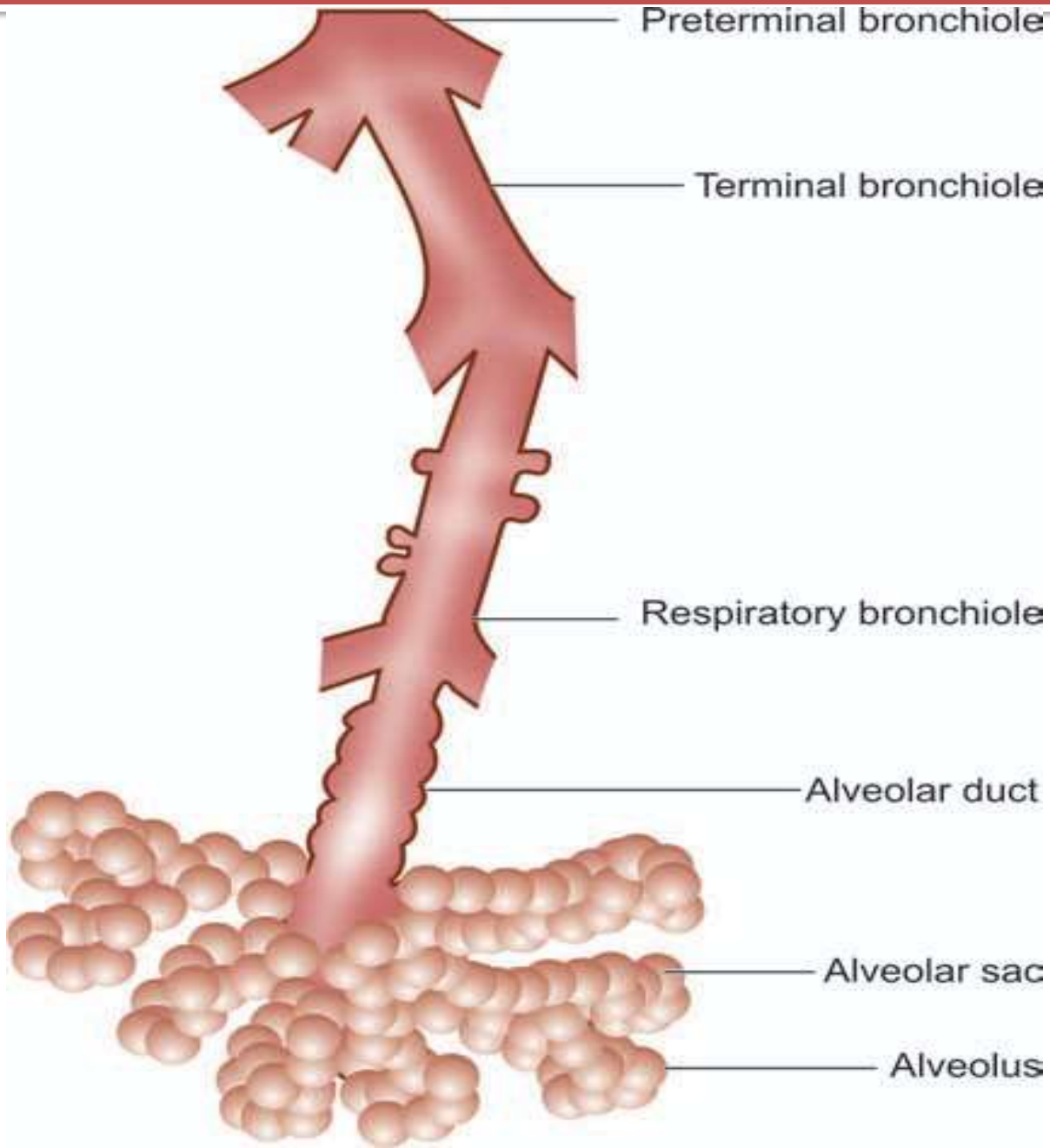
CHRONIC OBSTRUCTIVE PULMONARY DISEASE(COPD)

- **A GROUP OF PATHOLOGICAL CONDITIONS IN WHICH THERE IS COMPLETE OR PARTIAL OBSTRUCTION TO THE AIRWAY AT ANY LEVEL FROM TRACHEA TO THE SMALLEST AIRWAY RESULTING IN FUNCTIONAL DISABILITY OF THE LUNGS.**

COPD

chronic obstructive pulmonary disease, is a progressive disease that makes it hard to breathe. "Progressive" means the disease gets worse over time.

NORMAL ACINUS



- In COPD, less air flows in and out of the airways because of one or more of the following:
- The airways and air sacs lose their elastic quality.
- The walls between many of the air sacs are destroyed.
- The walls of the airways become thick and inflamed.
- The airways make more mucus than usual.

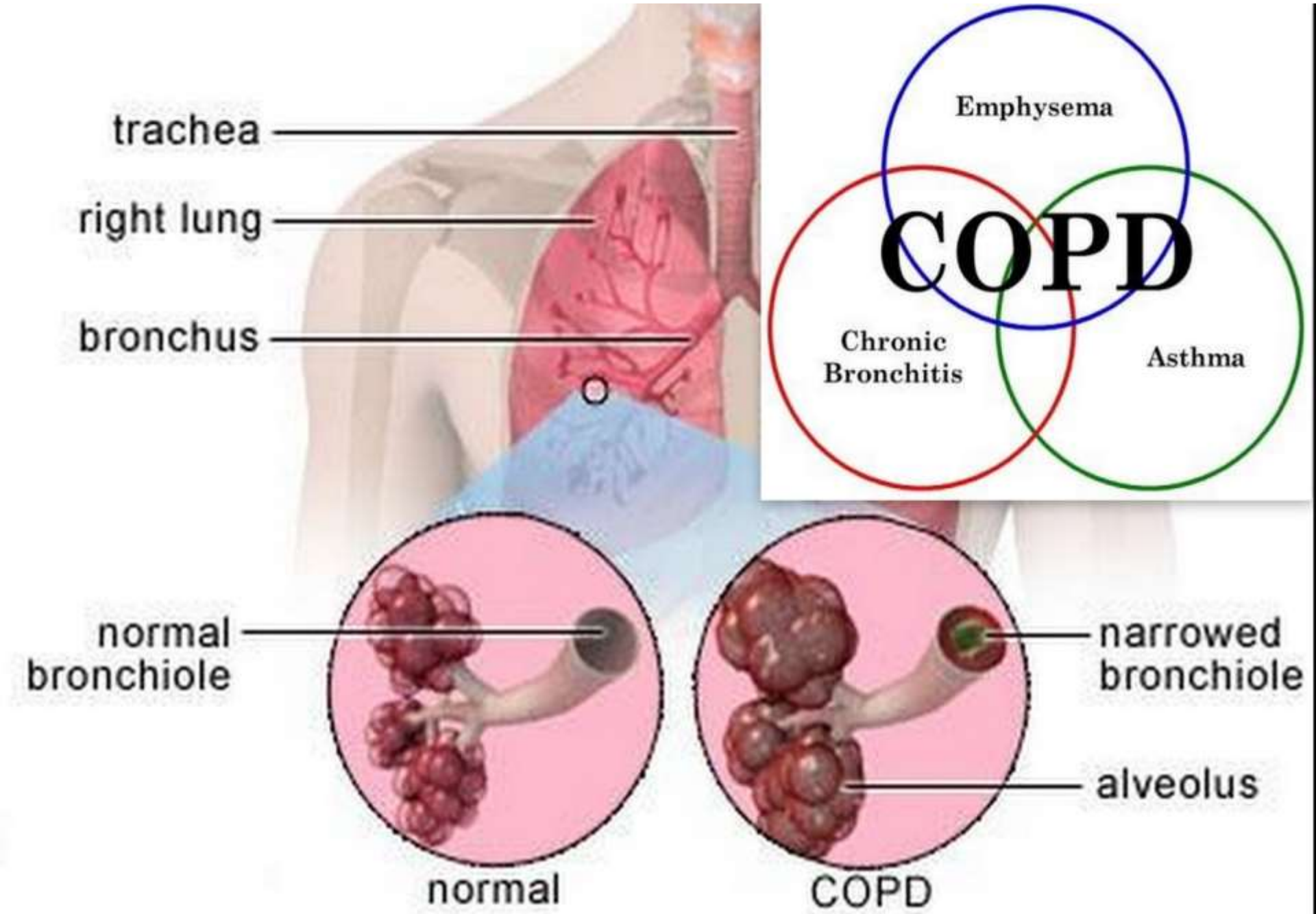
WHO IS AT RISK FOR GETTING COPD?

- **People most at risk for getting COPD are those who:**
- **Are current or former smokers**
- **Have occupations that put them in long-term contact with harmful chemicals, dust, fumes, and other pollutants;**

CONT…….

- Live in areas or buildings with high levels of air pollution, chemical fumes, asbestos, and other harmful dust particles.
- Have a genetic condition known as alpha-1 antitrypsin deficiency; about 1 out of 5,000-7,000 people have this inherited defect.

MAJOR DISEASES OF COPD



MAJOR DISEASES OF COPD

1. CHRONIC BRONCHITIS

2. EMPHYSEMA

3. BRONCHIAL ASTHMA

OTHER COPD DISEASES

Conditions such as bronchiectasis, extrinsic allergic alveolitis, and chronic airway obstruction also contribute to COPD.

Now, small airways disease involving inflammation of small bronchi and bronchioles (bronchiolitis) has also been added to the group of COPD.

CHRONIC BRONCHITIS

Chronic bronchitis is a common condition defined clinically persistent cough with expectoration on most days for at least three months of the year for two or more consecutive years. The cough is caused by oversecretion of mucus. In spite of its name, chronic inflammation of the bronchi is not a prominent feature.

ETIOPATHOGENESIS

1. Smoking

- i) It impairs ciliary movement.
- ii) It inhibits the function of alveolar macrophages.
- iii) It leads to hypertrophy and hyperplasia of mucussecreting glands
- iv) It causes considerable obstruction of small airways.
- v) It stimulates the vagus and causes bronchoconstriction

ETIOPATHOGENESIS……CONT……

- 2. Atmospheric pollution
- 3. Occupation
- 4. Infection
- 5. Familial and genetic factors

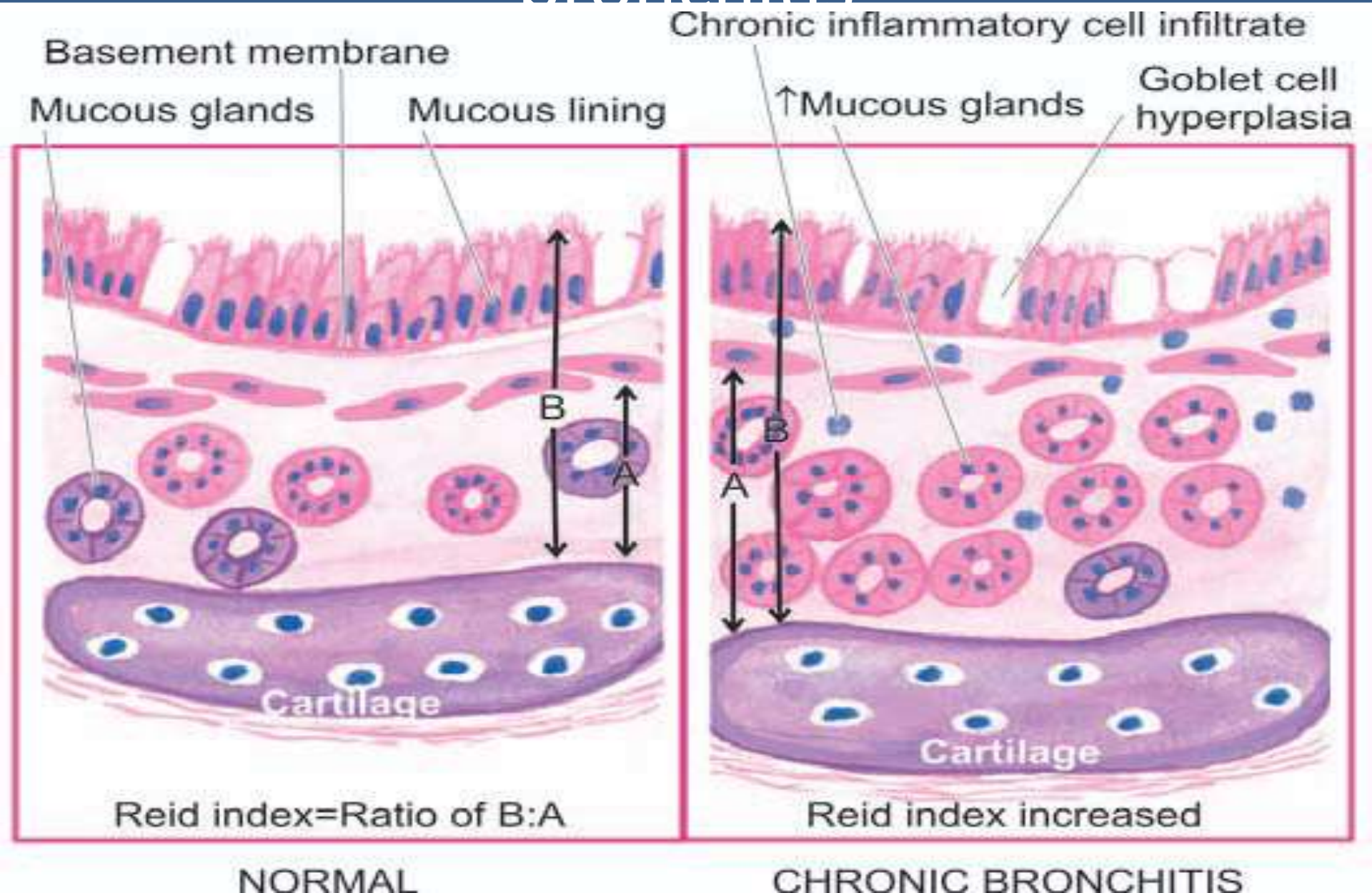
MORPHOLOGIC FEATURES

Grossly, the bronchial **wall is thickened, hyperaemic and oedematous. Bronchi and bronchioles may contain mucus plugs and purulent exudate.**

Microscopically-

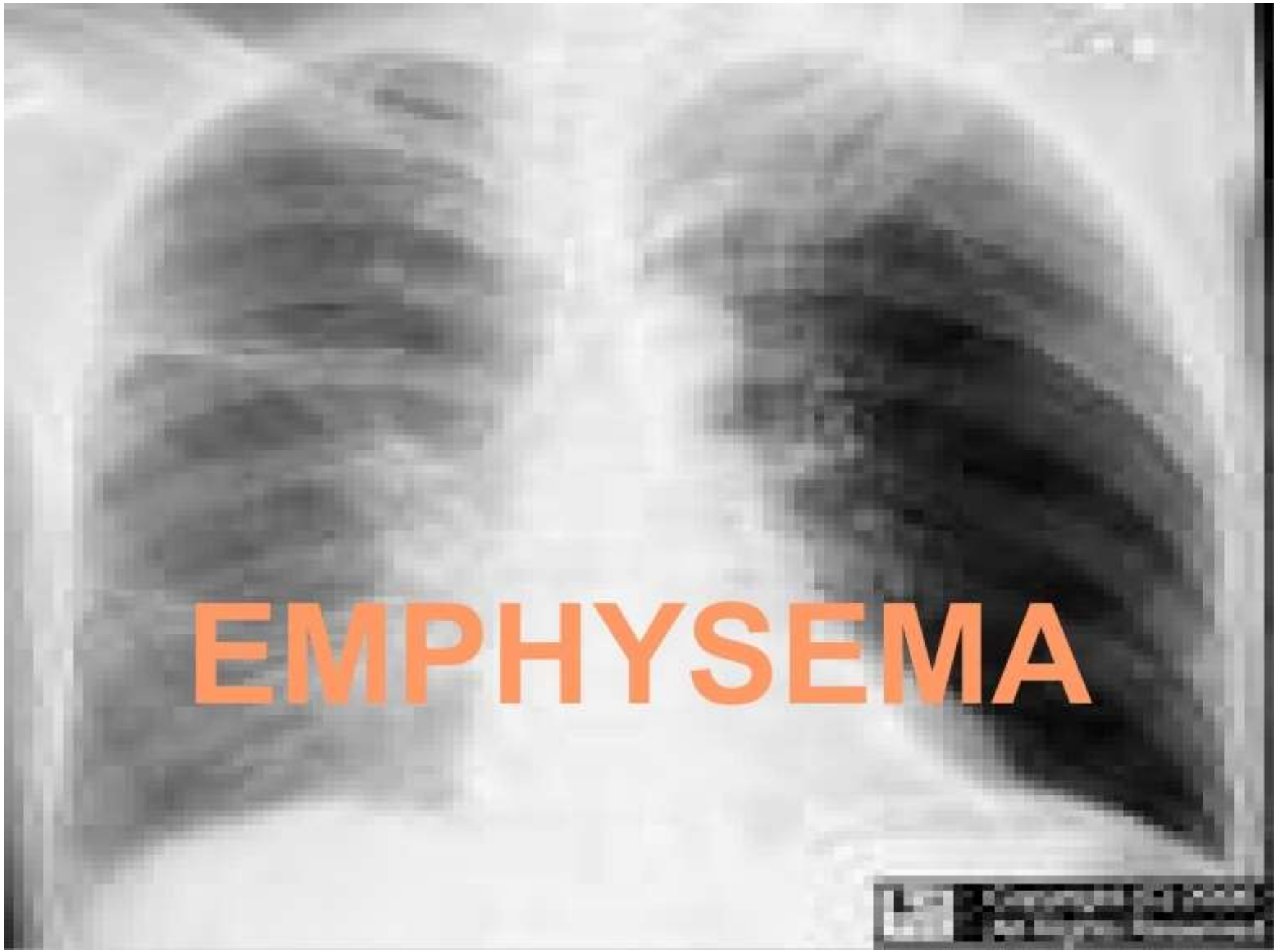
Increased Reid index. *Reid index is the ratio between thickness of* the submucosal mucus glands (i.e. hypertrophy and hyperplasia) in the cartilage-containing large airways to that of the total bronchial wall. The bronchial epithelium may show squamous metaplasia and dysplasia.

Increased Reid's indexin chronic bronchitis



CLINICAL FEATURES.

- Persistent cough with copious expectoration
- ‘morning catarrh’ or ‘throat clearing’
- Recurrent respiratory infections
- Dyspnoea
- Features of right heart failure


EMPHYSEMA

EMPHYSEMA

COMBINATION OF PERMANENT DILATATION OF AIR SPACES DISTAL TO THE TERMINAL BRONCHIOL & THE DESTRUCTION OF THE WALLS OF DIALATED AIR SPACES.

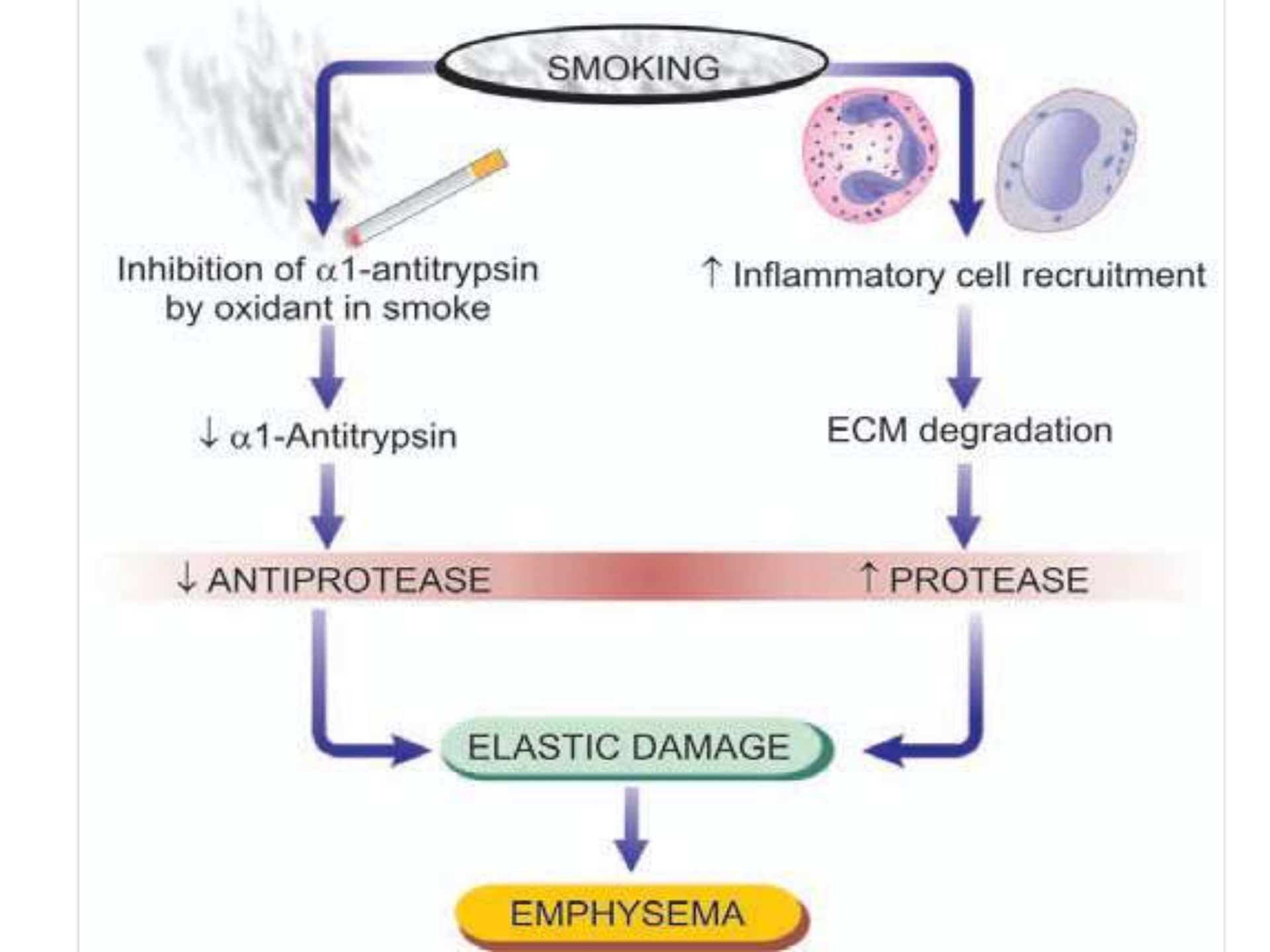
THE EMPHYSEMA IS DEFINED MORPHOLOGICALLY WHILE CHRONIC BRONCHITIS IS DEFINED CLINICALLY.

ETIOLOGY

common etiologic factors— most importantly –*Tobacco smoke & air pollutants*.

The *destruction of the alveolar walls, is not linked* to bronchial changes but is closely related to deficiency of serum alpha-1-antitrypsin (α1-protease inhibitor)

- **Alveolar wall destruction in emphysema by elastolytic action is based on the imbalance between proteases (chiefly *elastase) and anti-proteases (chiefly anti-elastase).***
- **By decreased anti-elastase activity i.e. deficiency of α-1 antitrypsin.**
- **By increased activity of elastase i.e. increased neutrophilic infiltration in th lungs causing excessive elaboration of neutrophil elastase.**

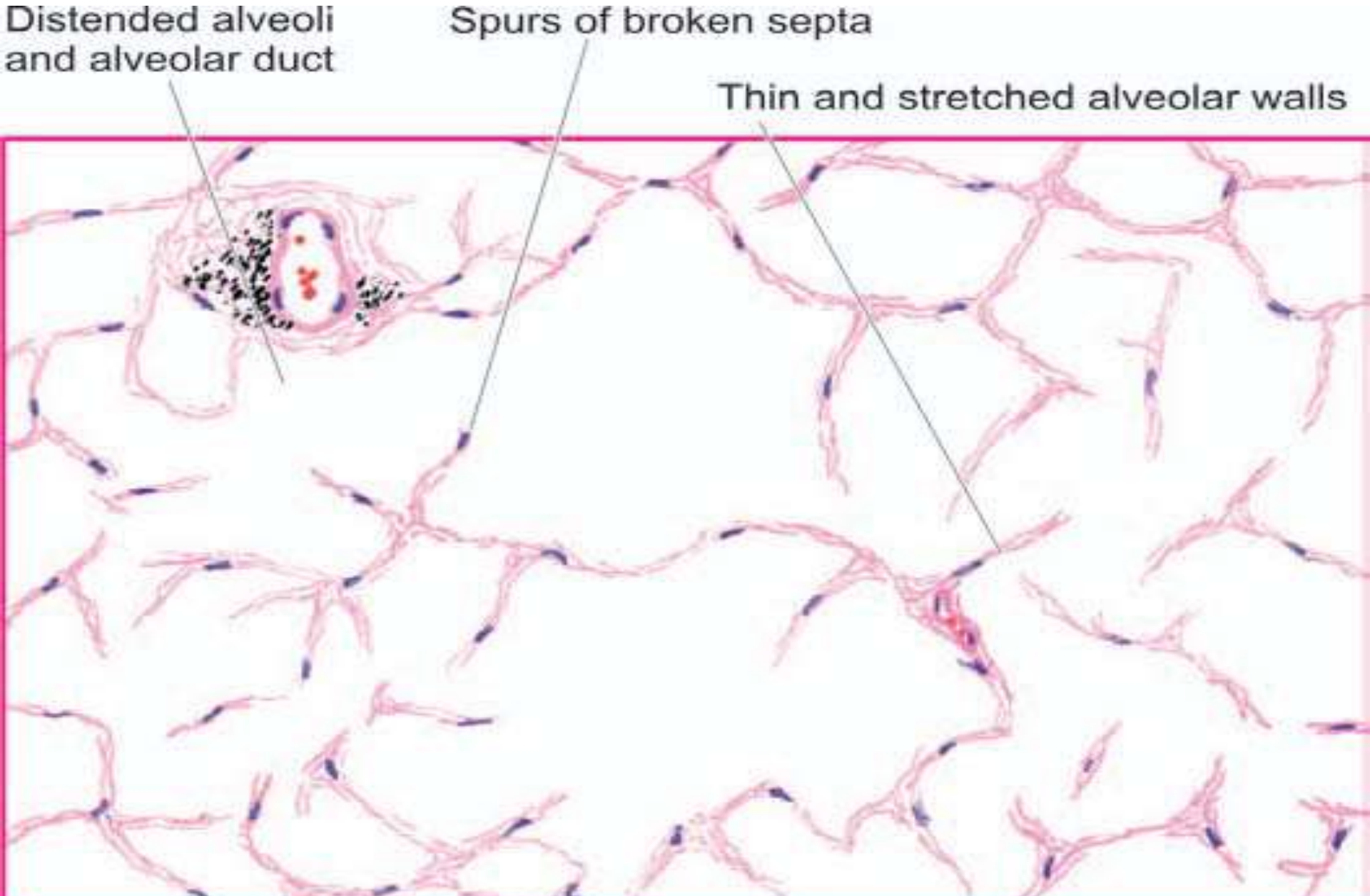

SMOKING
Inhibition of α1-antitrypsin by oxidant in smoke
↑ Inflammatory cell recruitment
↓ α1-Antitrypsin
ECM degradation
↓ ANTIPROTEASE
↑ PROTEASE
ELASTIC DAMAGE
EMPHYSEMA

Grossly, the lungs are voluminous, pale with little blood. **The edges of the lungs are rounded. Advanced cases show subpleural bullae and blebs bulging outwards from the surface of the lungs. Bullae are formed by the rupture of adjacent air spaces while *blebs are the result of rupture of alveoli directly into the* subpleural interstitial tissue .**

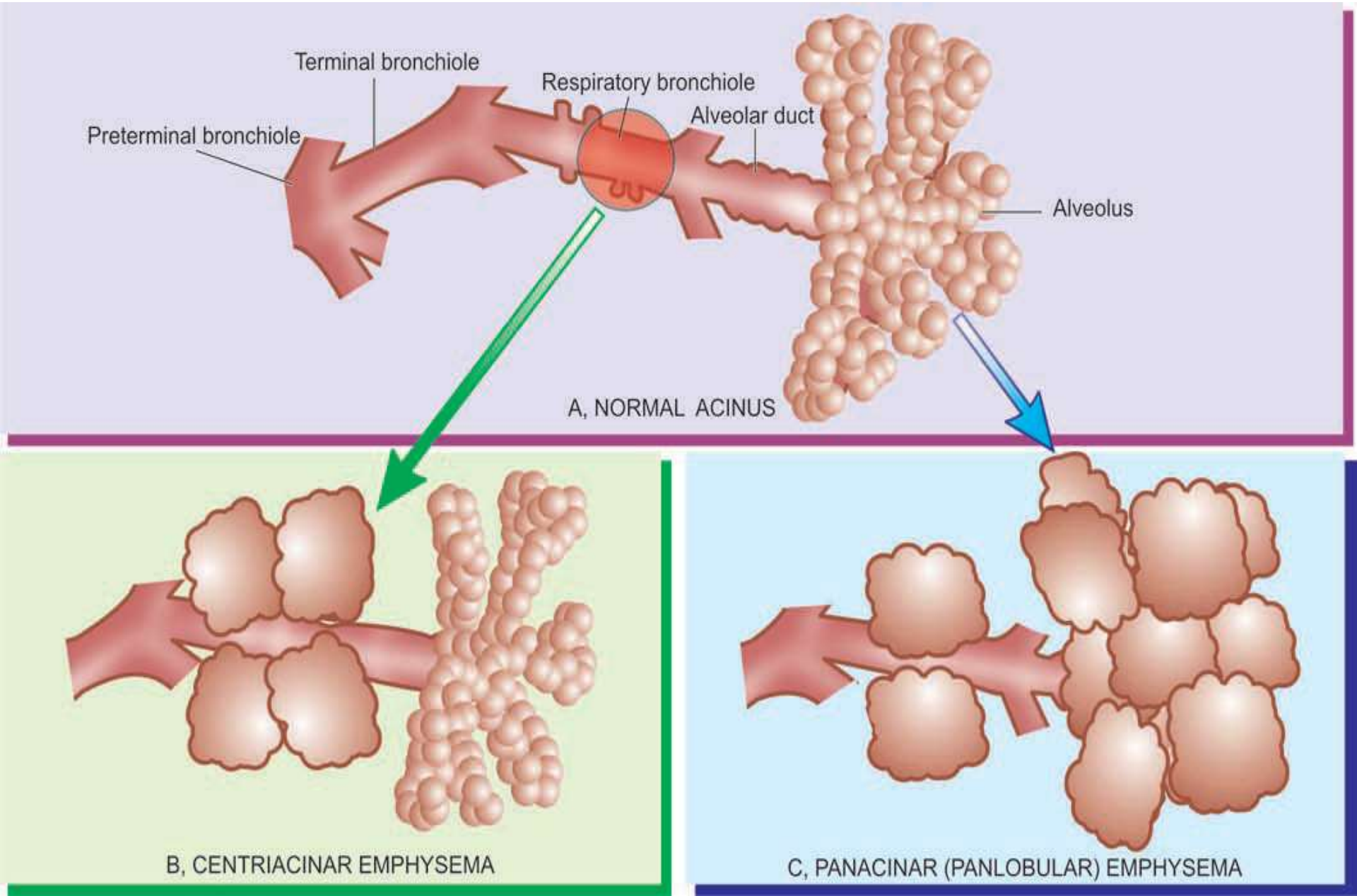
Microscopically, depending upon the type of emphysema, **there is dilatation of air spaces and destruction of septal walls of part of acinus involved i.e. respiratory bronchioles, alveolar ducts and alveolar sacs. Changes of bronchitis may be present. Bullae and blebs when present show fibrosis and chronic inflammation of the walls.**

Bullous emphysema

Panacinar emphysema



EMPHYSEMA - TYPES



Diff. B/W 'Predominant Bronchitis' and 'Predominant Emphysema'.

	Predominant Bronchitis	Predominant Emphysema
1.Age	About 50 years	About 60 years
2. Pathology	Hypertrophy of mucus-producing cells	destruction of septal walls & inflammatory narrowing of bronchioles
3. Dyspnoea	Late, mild	Early, severe
4. Cough	Before dyspnoea starts	After dyspnoea
5. Sputum	Copious, purulent	Scanty, mucoid
6. Bronchial infections	More frequent	Less frequent

	Predominant Bronchitis	Predominant Emphysema
7. Respiratory insufficiency	*Repeated Terminal*	
8. Cyanosis	*Common (‘blue-bloaters’)*	*(‘pink-puffers’)*
9. Lung capacity	*Normal*	*Increased(barrel-chest)*

BRONCHIAL ASTHMA

ASTHMA IS A EPISODIC DISEASE OF AIRWAY THAT IS CHARACTERISED BY INCREASED RESPONSIVENESS OF THE TRACHEOBRONCHIAL TREE TO A VARIETY OF STIMULI RESULTING IN WIDESPREAD SPASMODIC NARROWING OF AIR PASSAGES WHICH MAY RELIEVED SPONTANEOUSLY OR BY THERAPY, CHARACTERISED BY PROXYSMS OF DYSPNOEA,COUGH & WHEEZING.

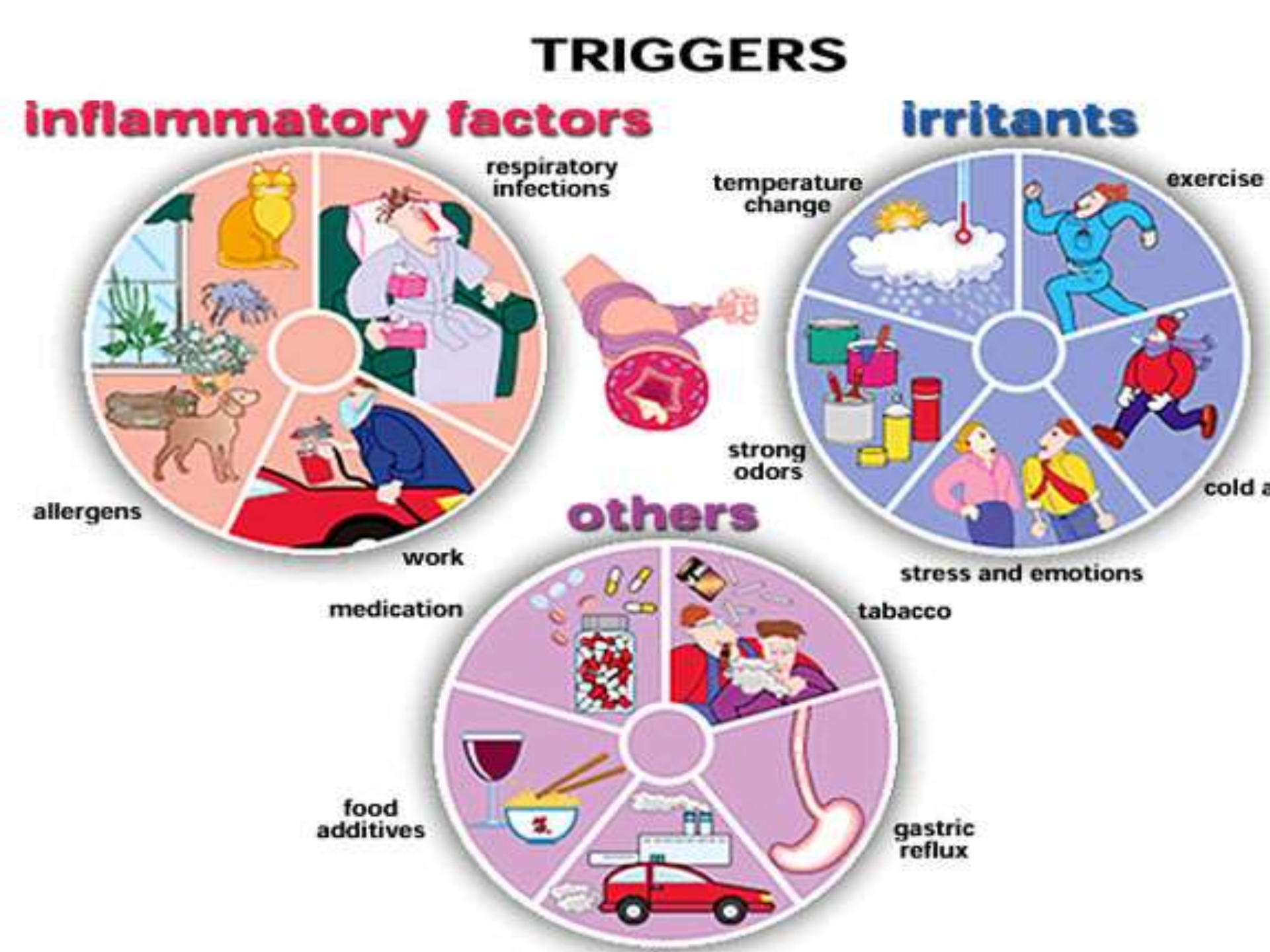
ETIOLOGICAL TYPES

- 1. EXTRINSIC(ATOPIC OR ALLERGIC) ASTHMA - PERSONAL OR FAMILY HISTORY OF ALLERGIC DISEASE.
- 2. INTRINSIC (IDIOCYNCRATIC OR NON-ATOPIC) ASTHMA – AFTER AN UPPER RESPIRATORY TRACT INFECTION OR HYPERSENSIVITY TO DRUGS
- 3. MIXED TYPE – MIXED FEATURES OF BOTH

Features of the Two Major Types of Asthma

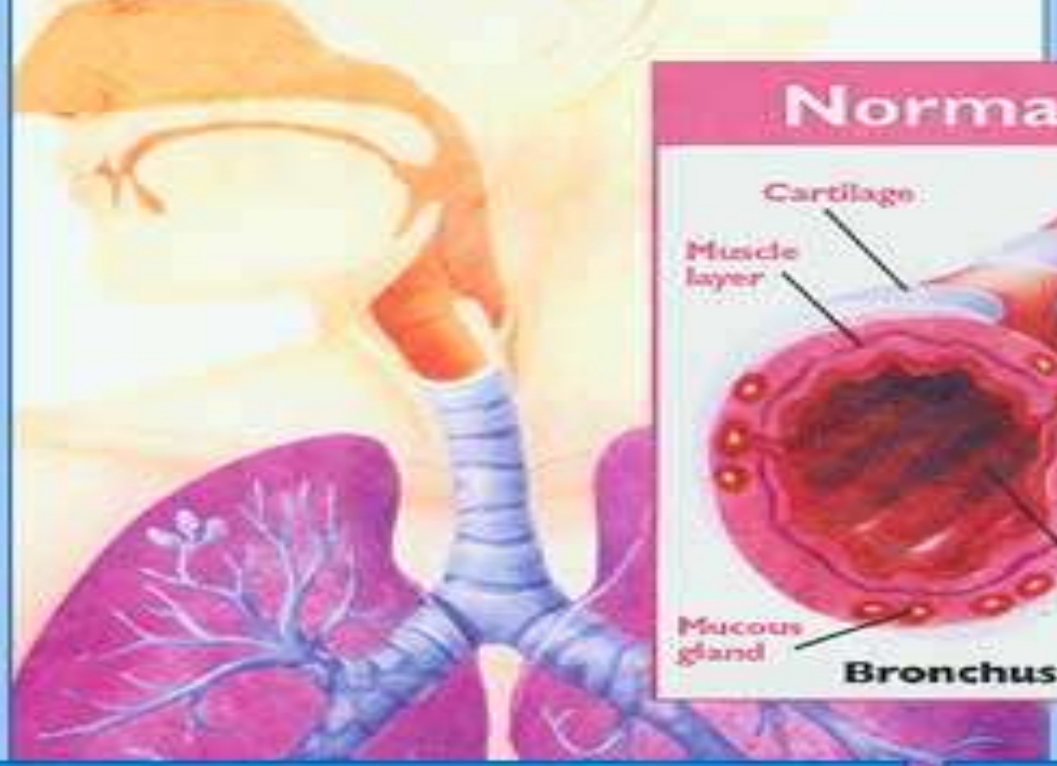
Feature	Extrinsic Asthma	Intrinsic Asthma
1. Age	*In childhood*	*In adult*
2. family history	*Commonly present*	*Absent*
3. allergic illness	*Present*	*Absent*
4. Allergens	*Present (dust, pollens etc)*	*None*

TRIGGERS


inflammatory factors
respiratory infections
allergens
work
irritants
temperature change
exercise
strong odors
stress and emotions
cold a
others
medication
tabacco
food additives
gastric reflux

BRONCHIAL ASTHMA

- Reversible Bronchial Constriction
- Bronchial Mucous Plugs
- Bronchial Wall Thickening

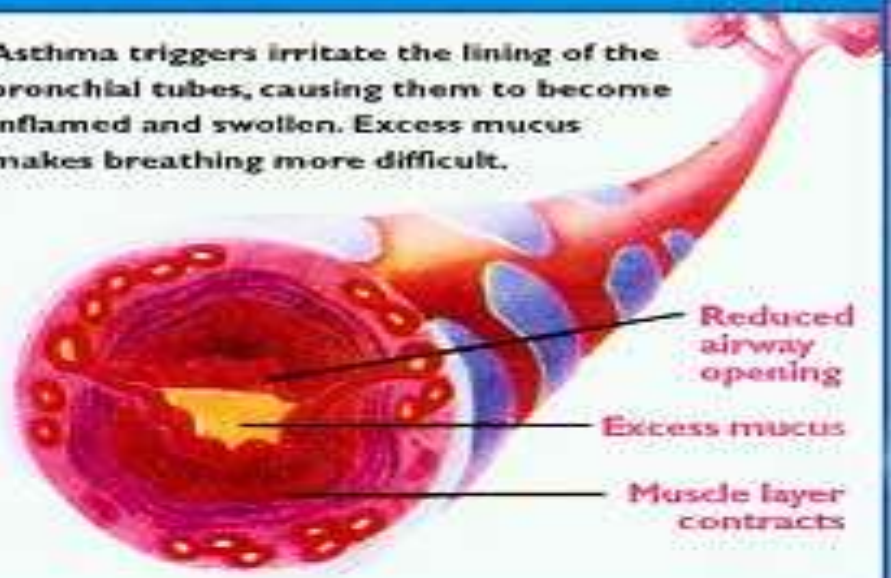


Normal

Asthma

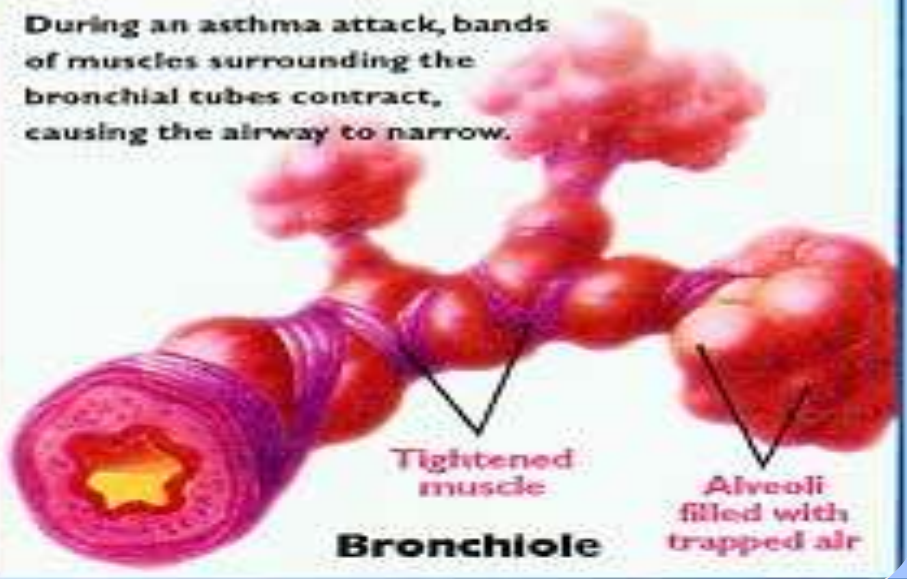
Inflammation

Asthma triggers irritate the lining of the bronchial tubes, causing them to become inflamed and swollen. Excess mucus makes breathing more difficult.



Bronchoconstriction

During an asthma attack, bands of muscles surrounding the bronchial tubes contract, causing the airway to narrow.

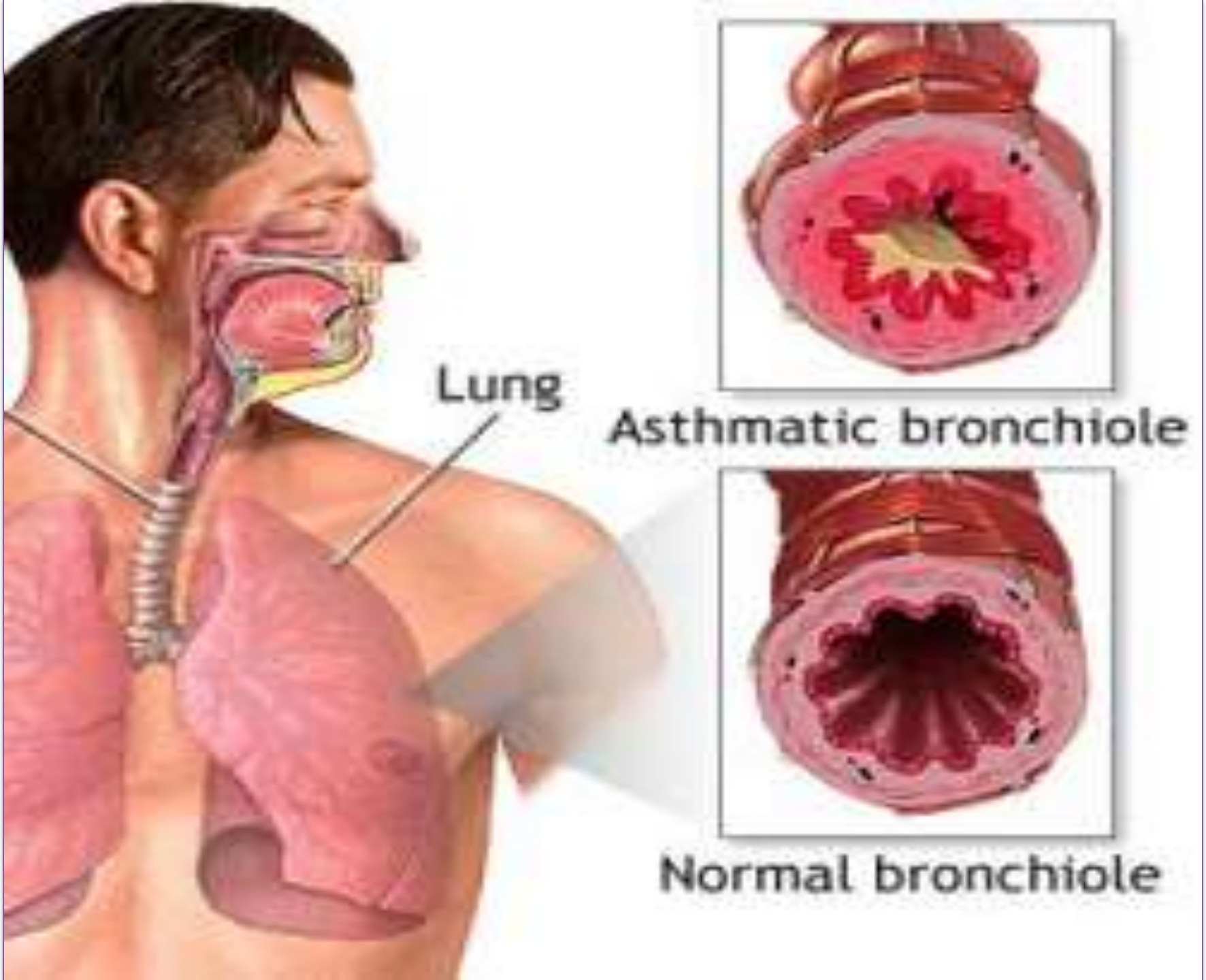


MORPHOLOGIC FEATURES.

Grossly-

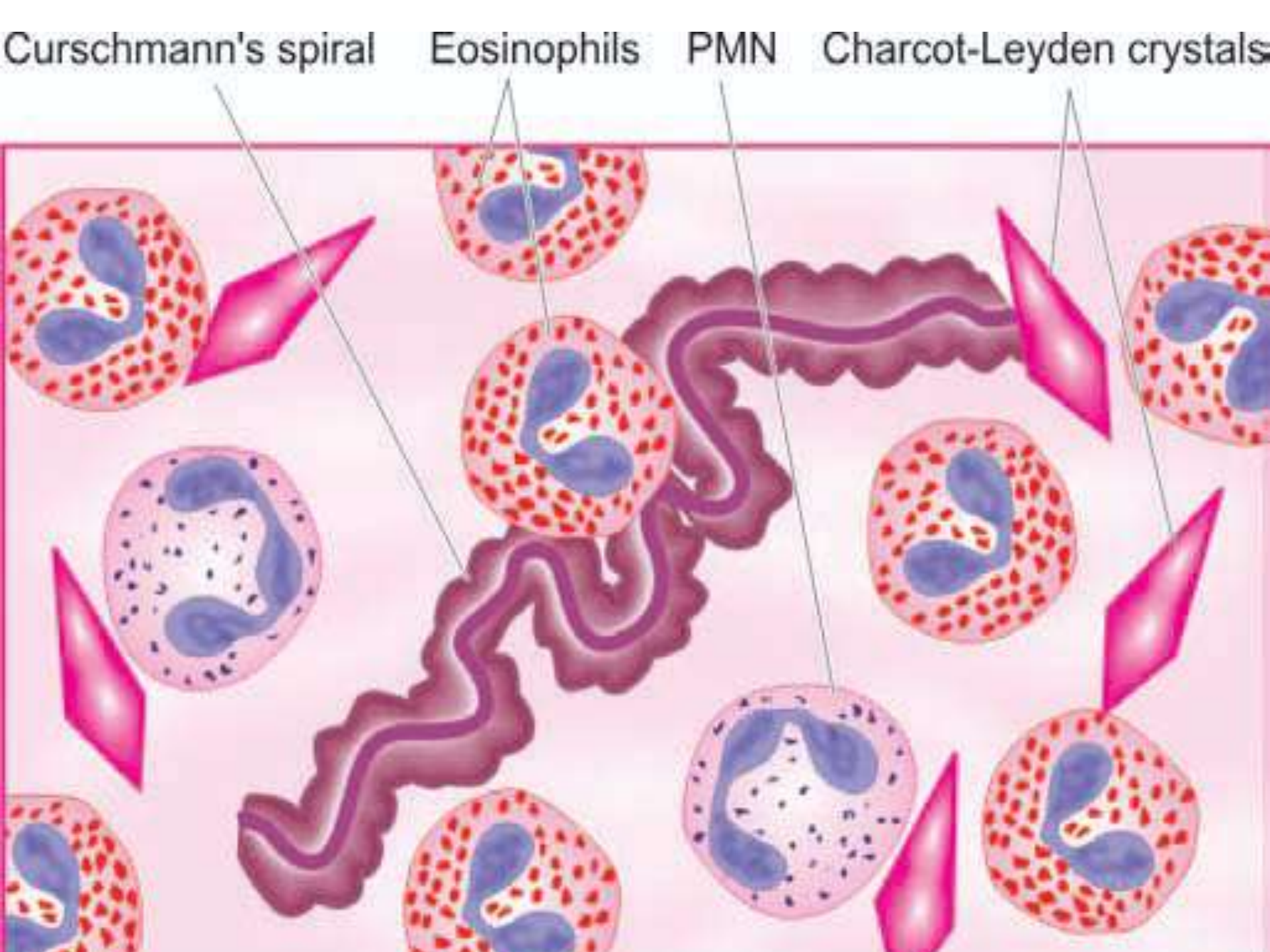
The lungs are overdistended due to over-inflation.

The cut surface shows characteristic occlusion of the bronchi and bronchioles by viscid mucus plugs.

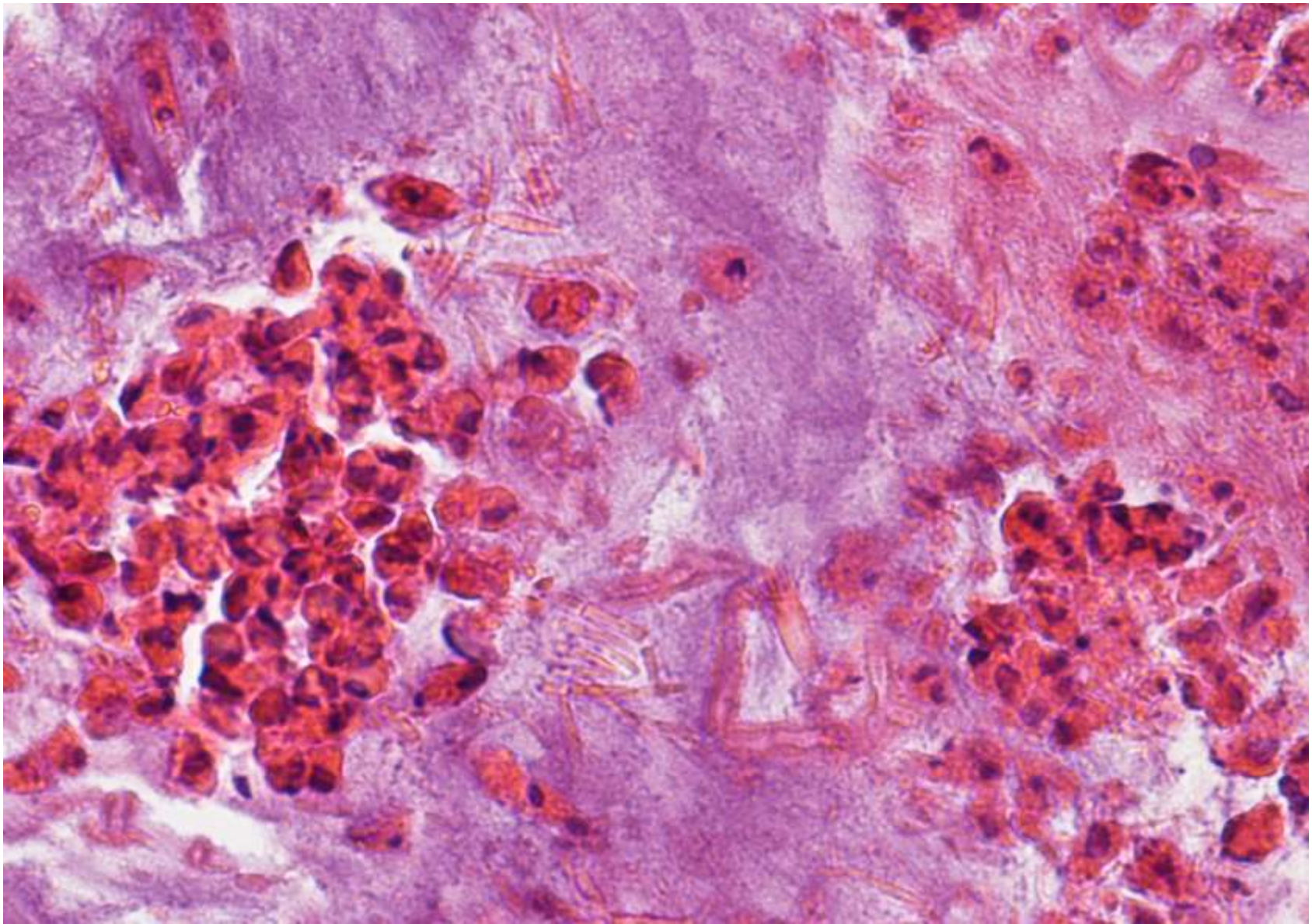

Lung
Asthmatic bronchiole
Normal bronchiole

Microscopically-

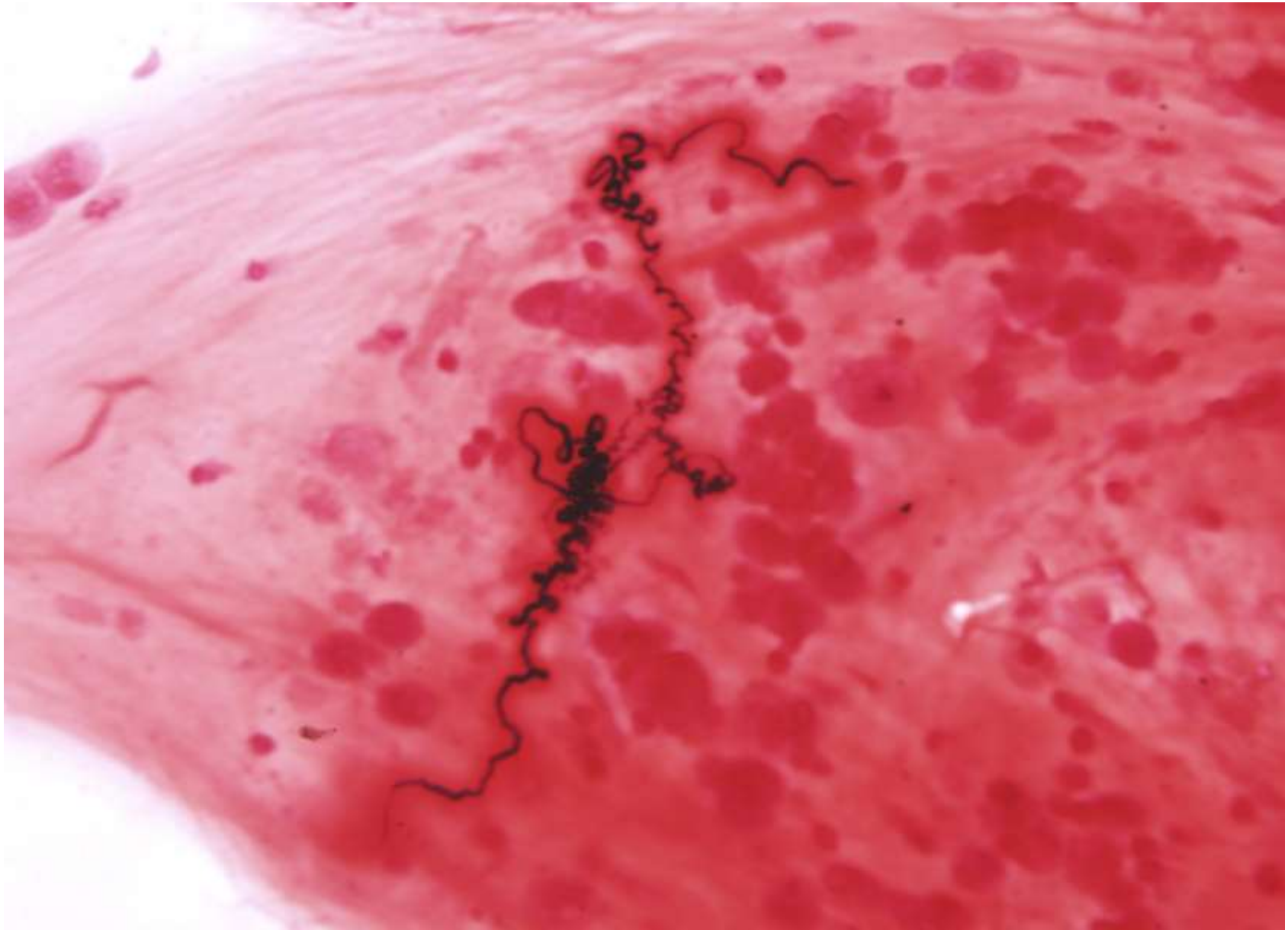
1. The mucus plugs contain normal or degenerated respiratory epithelium forming twisted strips called ***Curschmann's spirals.***
2. The sputum usually contains numerous eosinophils and diamond-shaped crystals derived from eosinophils called ***Charcot-Leyden crystals.***
3. The bronchial wall shows thickened bronchial epithelium, submucosal oedema and inflammatory infiltrate of lymphocytes,cells with prominence of eosinophils.There is hypertrophy of submucosal glands as well as of the bronchial smooth muscle.


Curschmann's spiral
Eosinophils
PMN
Charcot-Leyden crystals

CHARCOT-LEYDEN CRYSTALS



CURSCHMAN'S SPIRAL



CLINICAL FEATURES

Asthmatic patients suffer from episodes of acute attacks with symptom free periods. Characteristic clinical features are paroxysms of dyspnoea, cough and wheezing. Most attacks typically last for a few minutes to hours.

When attacks occur continuously it may result in more serious condition called *status asthmaticus*.

Studies that may help in diagnosis:

.Physical examination

. Auscultation

INVESTIGATIONS-

- Chest X-ray
- Blood examination
- Spirometry
- Arterial blood gas

Homoeopathic treatment for Chronic Respiratory Problems(COPD)

Bryonia: In people with a dry hacking cough and rusty sputum, this homeopathic medicine. The symptoms are aggravated by any sort of motion and warm temperatures.

Rumex: In people with dry/stringy cough, which is increased in cold temperatures and by talking, this homeopathic medicine proves useful.

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Aconite: This homeopathic remedy is very useful in treating bronchitis, where there is frequent sneezing, restlessness, coryza-like symptoms or excessive perspiration. Its uniqueness is that it prevents the development of full-fledged bronchitis.

Kali Bichromicum: Where the patient has yellow, sticky mucous which is worse in the morning, this homeopathic remedy is effective

Belladonna: This homeopathic medicine is useful in patients with bronchitis who have a violent fever and distressing cough that is worse with lying down and at night. The coughing spells are dry and short with irregular breathing. There is also fullness in the chest with no pain, though children might cry with this fullness. There is increased drowsiness where patients sometimes doze off into a semiconscious state.

Sulphur: This homeopathic medicine is very useful in people with chronic bronchitis symptoms, where the patient has significant rales (sounds due to air movement within the bronchi). This is accompanied by mucous that is thick and can contain pus. The patient could also suffer from bouts of suffocation.

Bacillinum: This homeopathic medicine used for respiration problems faced by people who tend to catch a cold easily. The mucous membranes are highly irritated and the patient feels very congested.

Other useful homeopathic medicines for respiratory problems include Phosphorus, Mercurius, Antimonium tartaricum, Rumex, Pulsatilla, Ipea, Chelidonium, and Sulphur. As noted, with homeopathic compounds, the right compound is determined by multiple factors including the stage at which the infection is at the time of presentation, nature of the cough, type of mucus, aggravating or relieving factors, presence of cold, overall health status, habits, etc.

THANK YOU