आईएफटीएम विश्वविद्यालय, मुरादाबाद, उत्तर प्रदेश

IFTM University, Moradabad, Uttar Pradesh

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UNIT -II

1. **CARDIOVASCULAR DISORDER**
2. **RESPIRATORY DISORDERS**

CARDIOVASCULAR DISORDERS

1. Hypertension

2. Ischemic heart disease (IHD)
   - (i) Angina Pectoris
   - (ii) Myocardial Infarction (MI)
   - (iii) Atherosclerosis

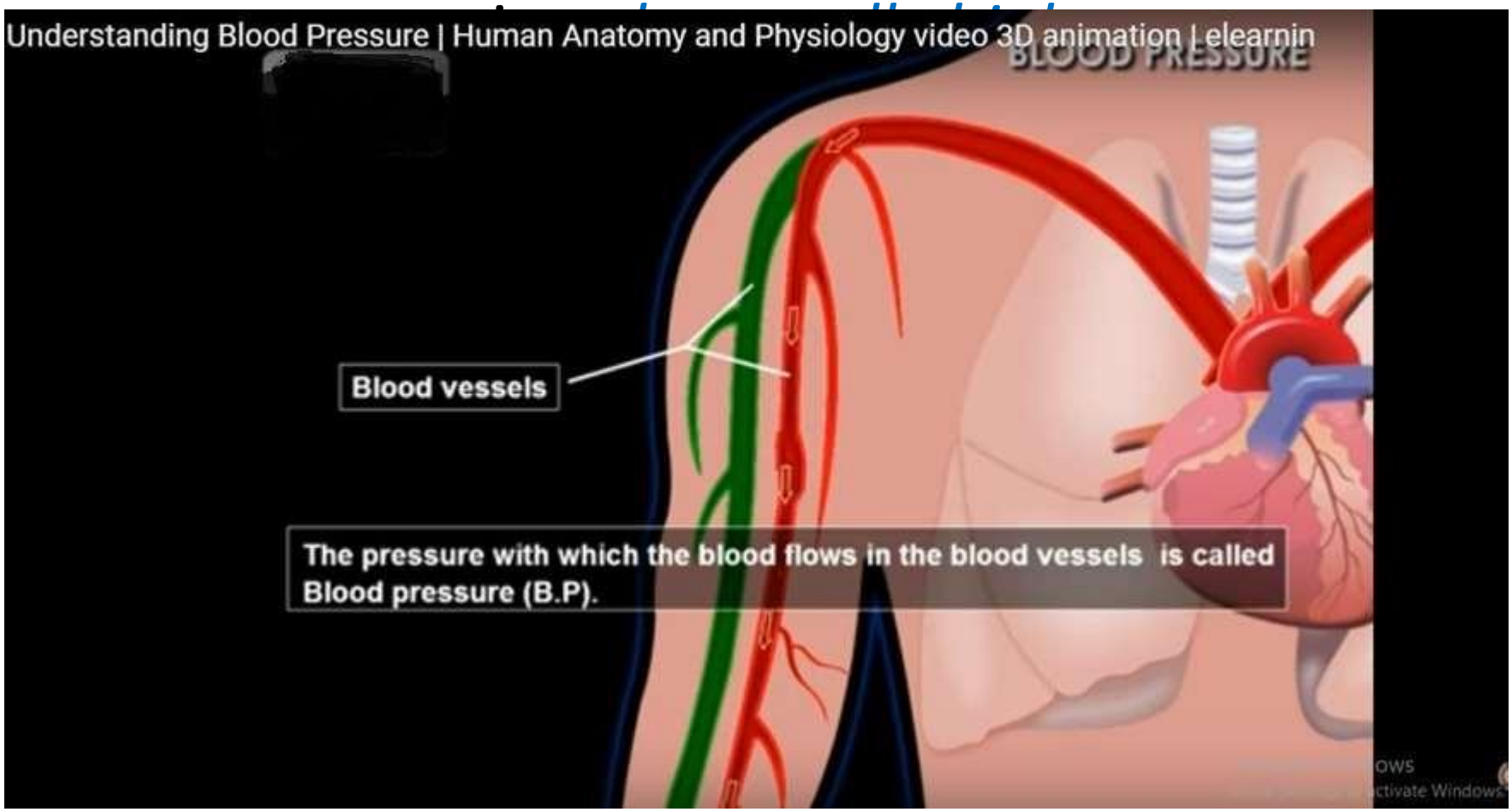
HOW TO EXPLAIN *DISEASE* IN THE EXAM ??

Diseases should be explained in the following headings/ subheadings-

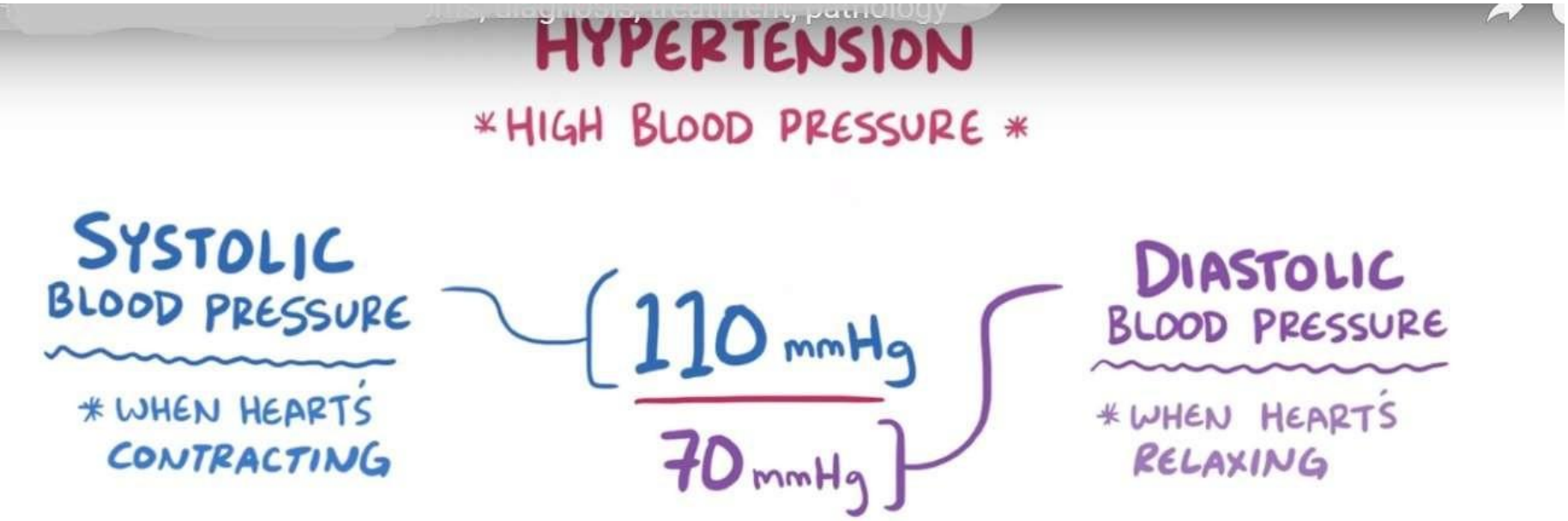
1. Introduction of disease
2. Symptoms and signs (Clinical manifestations)
3. Etiology
4. Pathophysiology
5. Diagnosis
6. Prevention
7. Treatment

1. HYPERTENSION: INTRODUCTION

- It is the most common disorder in which *blood*



1. HYPERTENSION: INTRODUCTION



1. HYPERTENSION: INTRODUCTION

SYSTEMIC HYPERTENSION

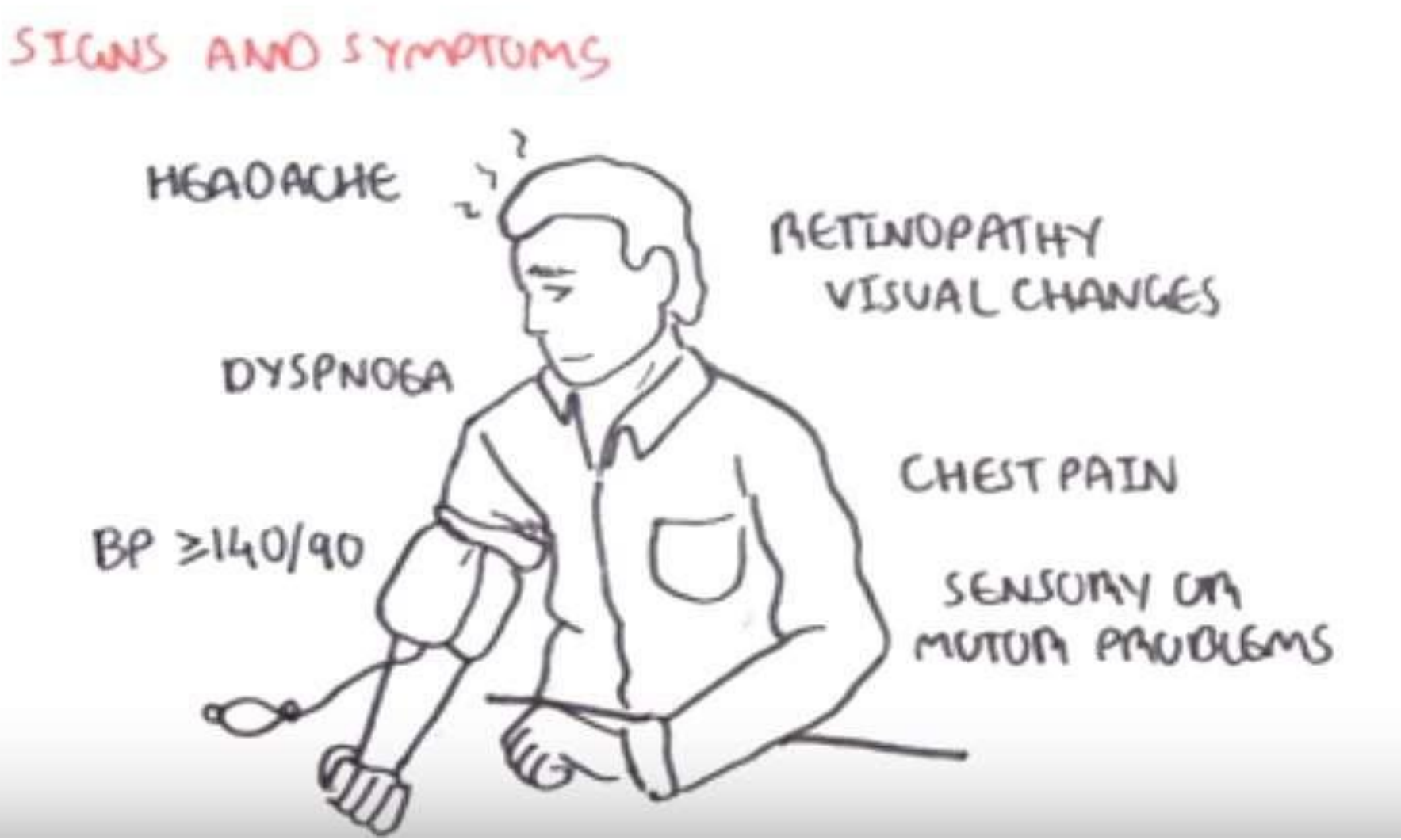
- Hypertension (HT) = pathologically ↑ blood pressure Systolic /diastolic pressure
- Blood pressure :
- **Normal blood pressure (adults)** : < 140 mm Hg/90 mm Hg
- **Borderline HT** : 140 - 160 mm Hg/90 - 95 mm Hg
- **Definite HT** : > 160 mm Hg/95 mm Hg

1. HYPERTENSION: INTRODUCTION

CLASSIFICATION OF HYPERTENSION

- Primary (Essential) Hypertension
  - Elevated BP with unknown cause
  - 90% to 95% of all cases
- Secondary Hypertension
  - Elevated BP with a specific cause
  - 5% to 10% in adults

1. HYPERTENSION: Sign & Symptoms



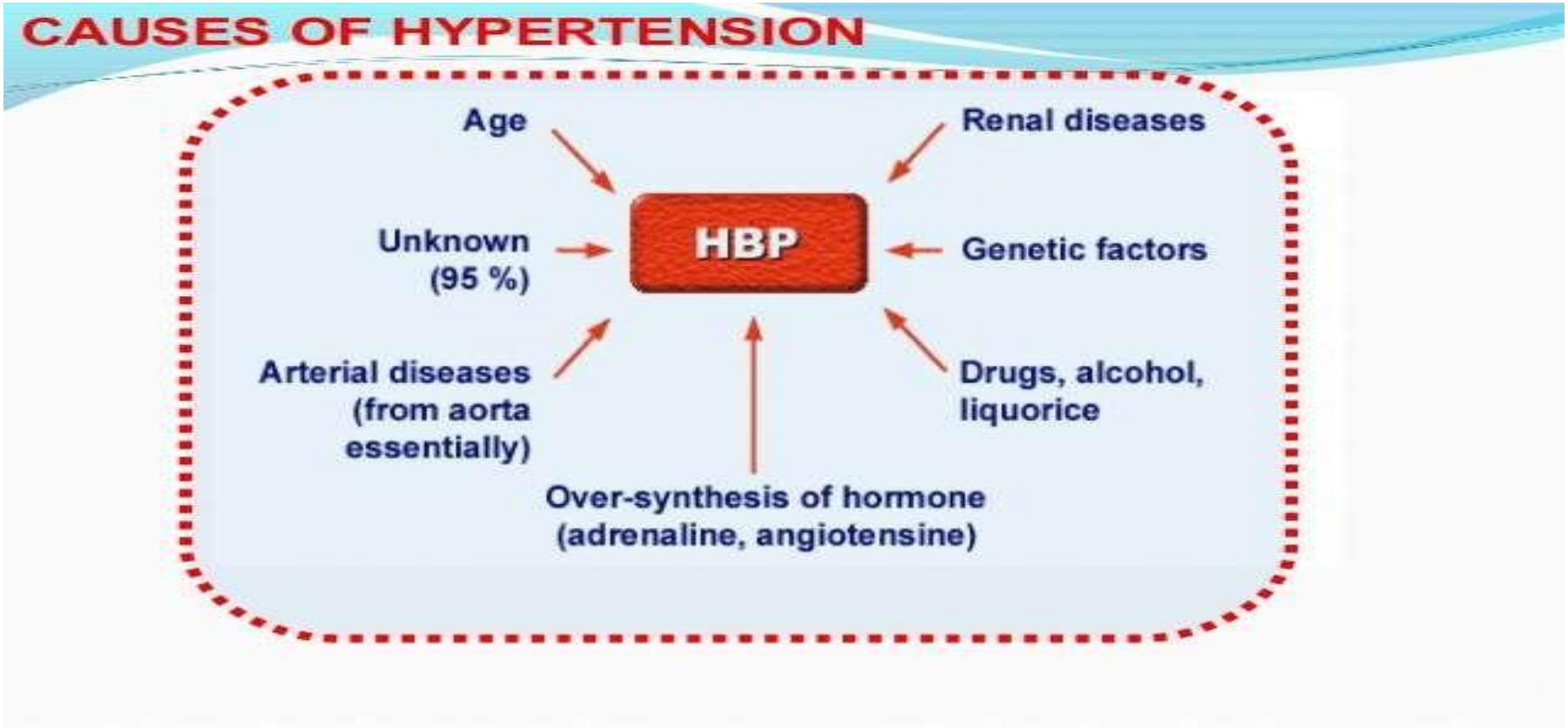
1. HYPERTENSION: Sign & Symptoms

- Dizziness
- Blurred or double vision
- Nausea
- Headache
- Drowsiness
- Nosebleeds
- A flushed face
- Shortness of breath
- Etc

1. HYPERTENSION: Etiology

No clear cause. The various risk factors involves-

1. Old age
2. Obesity
3. High salt intake (sodium)
4. Bad life style



1. HYPERTENSION: Pathophysiology

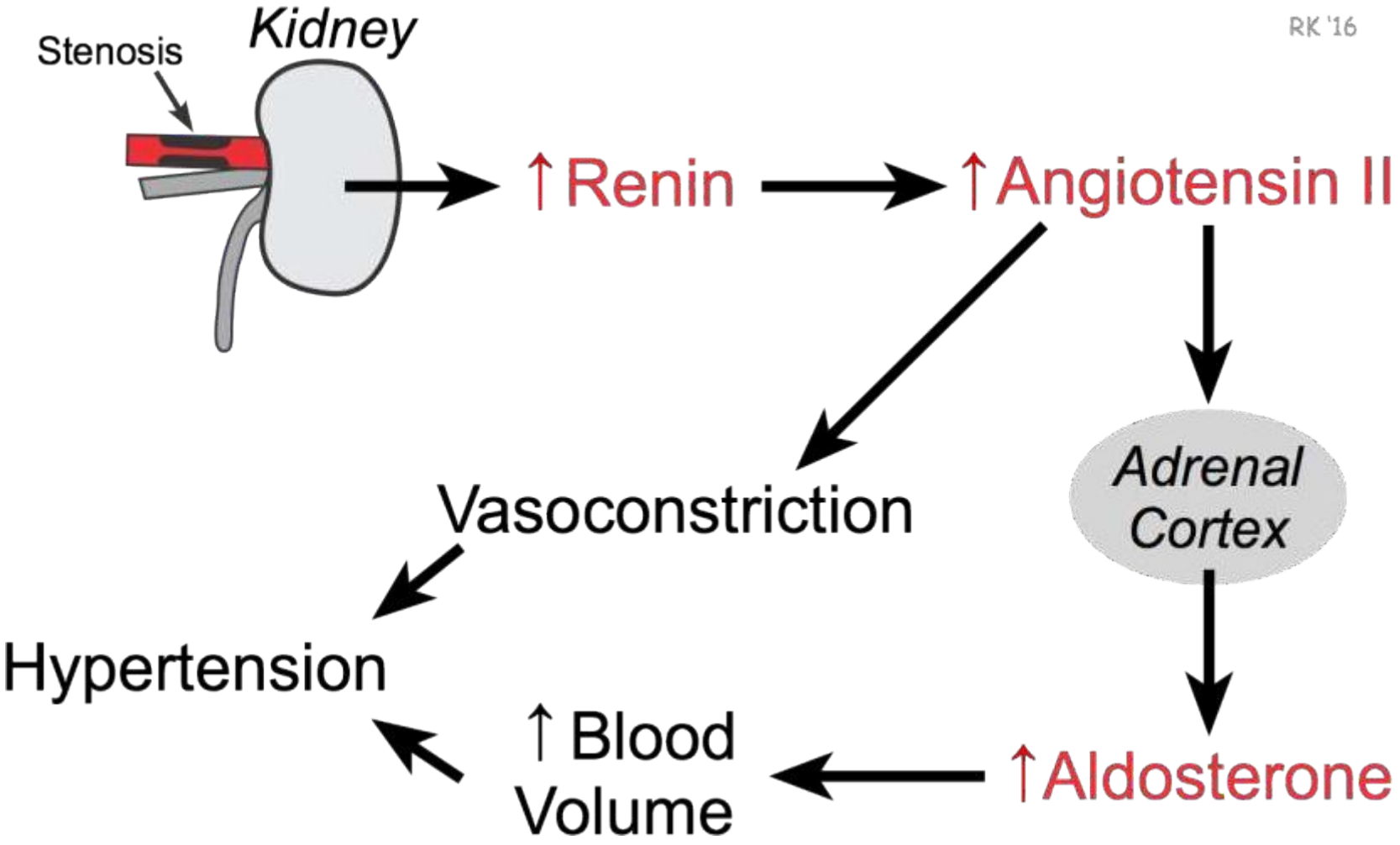
1. Role of Renin-Angiotensin-Aldosterone System (RAAS)

RENIN- A hormone release by kidney.

ANGIOTENSIN- a hormone released by angiotensinogen in liver.

ALDOSTERONE- hormone released by adrenal gland (present as a cap over kidney)

1. HYPERTENSION: Pathophysiology



1. HYPERTENSION: Pathophysiology

2. . **Alteration in Cardiac output (CO)/ Heart rate (HR) /stroke volume (SV)**

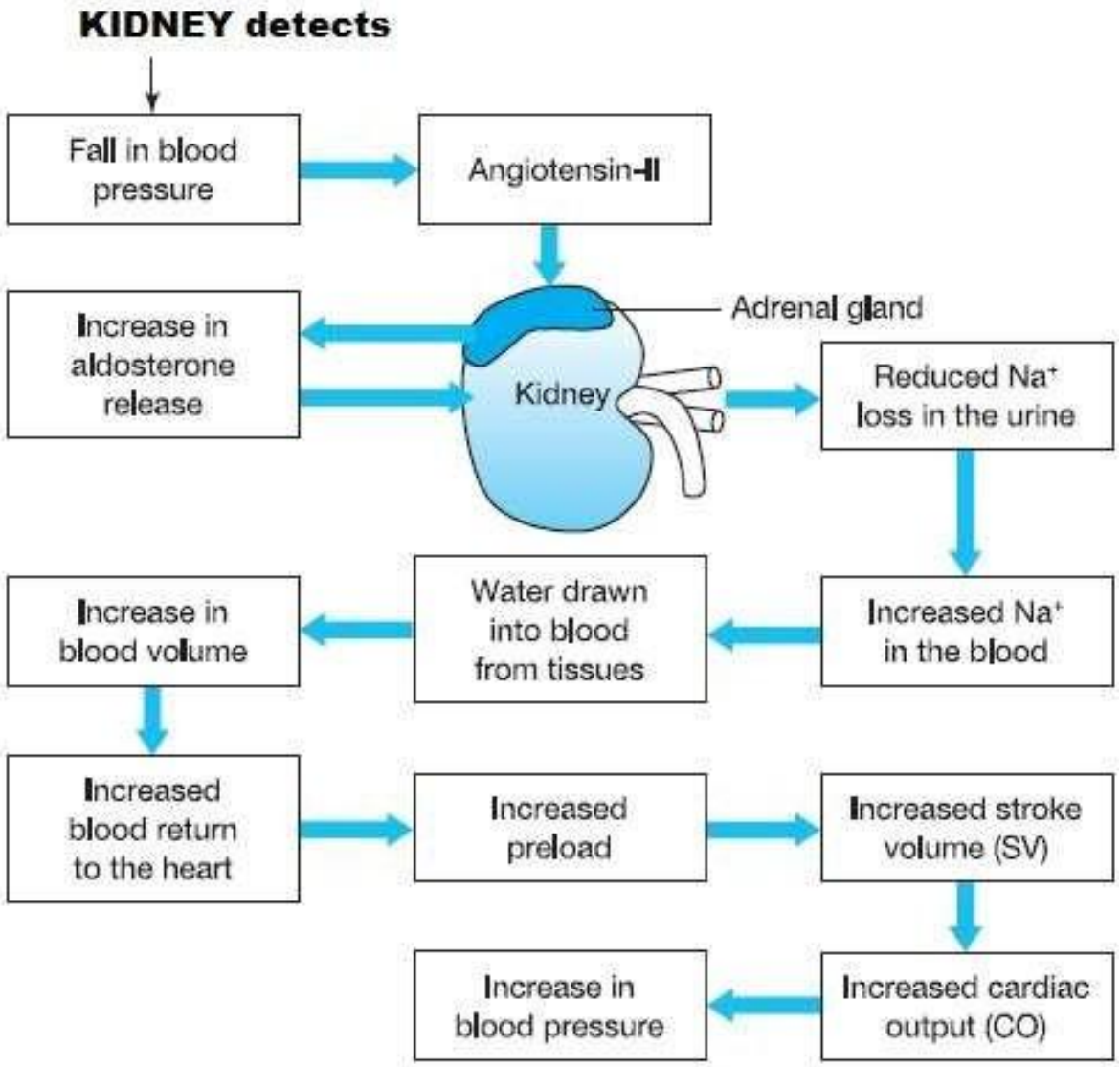
Introduction

1. **Cardiac output** – the volume of blood pumped from each ventricle per minute:

CO	=	SV	x	HR
cardiac output (ml/minute)	=	stroke volume (ml/beat)	X	heart rate (beats/min)

a. Average heart rate = 70 bpm
b. Average stroke volume = 70–80 ml/beat
c. Average cardiac output = 5,500 ml/minute

1. HYPERTENSION: Pathophysiology



1. HYPERTENSION: DIAGNOSIS

AFTER

SYMPTOMS- BY

<u>Sphygmomanometer</u> and checks the B.P. (arterial)

1. HYPERTENSION: Prevention

Lifestyle Modifications for Prevention of Hypertension

- Lose weight if overweight
- Limit alcohol
- Increase physical activity
- Decrease sodium intake
- Keep potassium intake at adequate levels
- Take in adequate amounts of calcium and magnesium
- Decrease intake of saturated fat and cholesterol
- Stop smoking

1. HYPERTENSION: Treatment

ANTI-HYPERTENSIVES DRUGS-

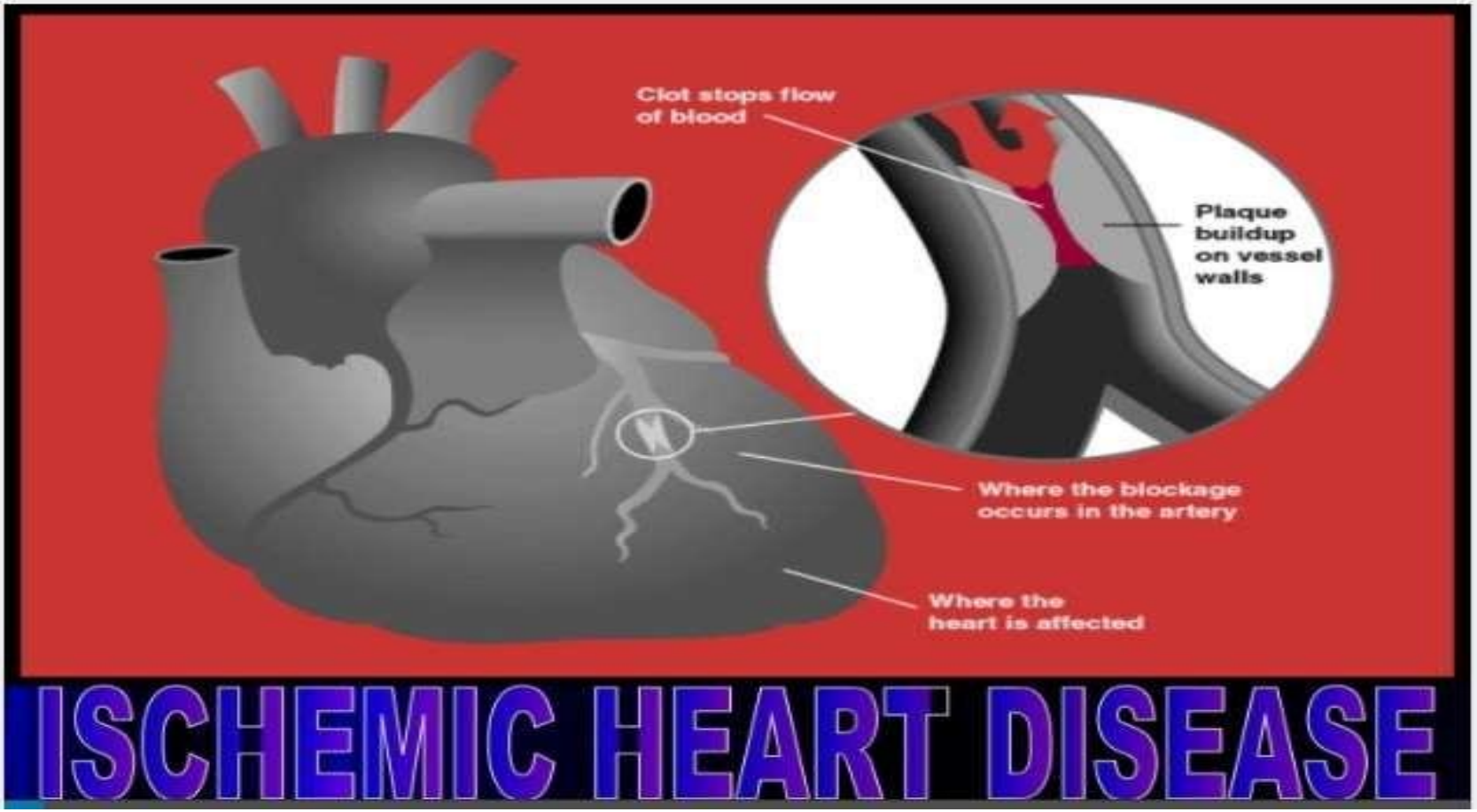
1. ATENOLOL
2. RAMIPRIL
3. TELMISARTAN

2. Ischemic heart disease (IHD)

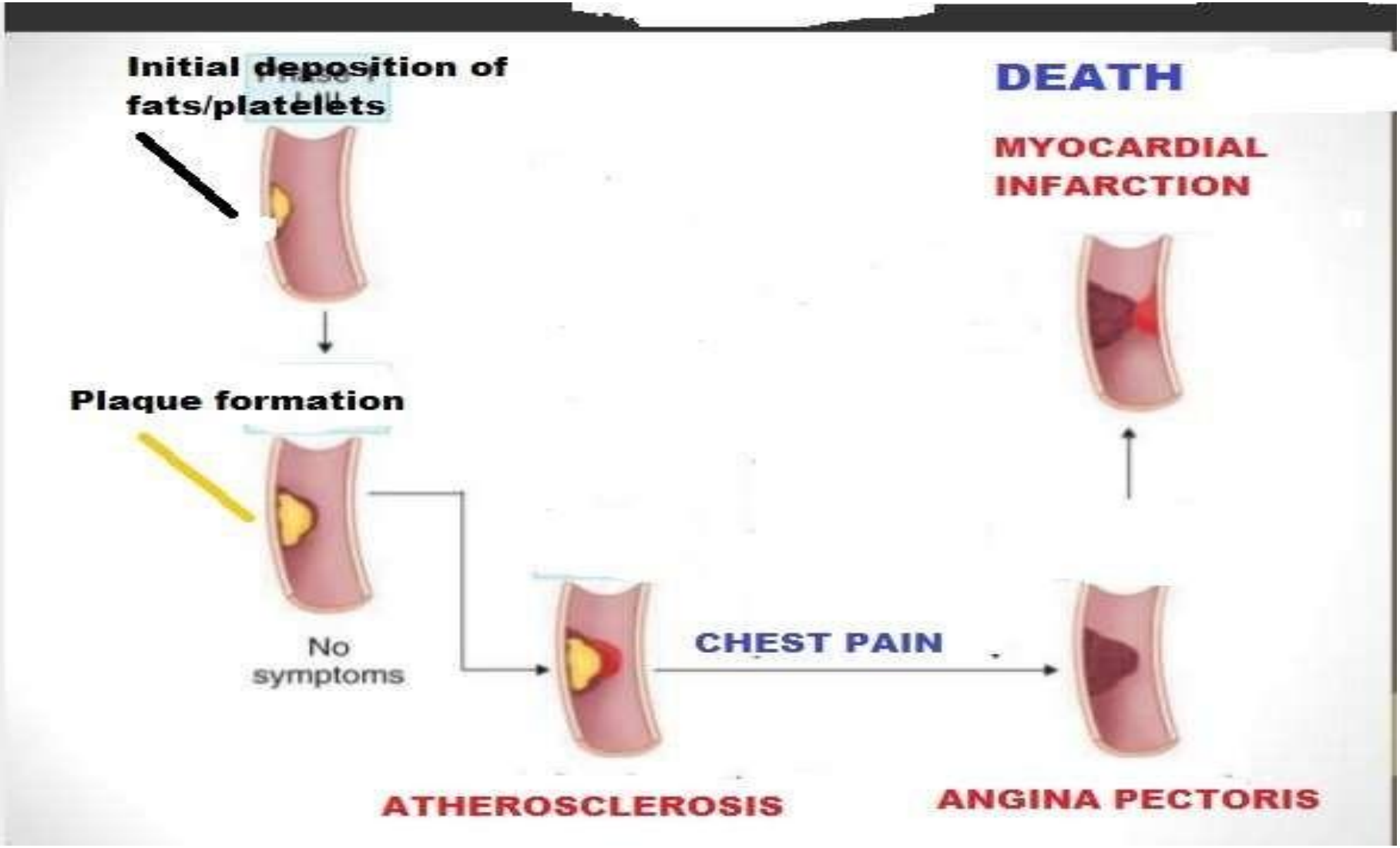
(i) Angina Pectoris
(ii) Myocardial Infarction (MI)
(iii) Atherosclerosis

Ischemic heart disease (IHD)

Ischemia = decreased blood supply to muscles due to blockage.



ATHEROSCLEROSIS- ANGINA- MYOCARDIAL INFARCTION



1.
ATHEROSCLEROSIS

ATHEROSCLEROSIS: INTRODUCTION

- **Atherosclerosis** (also known as **Arteriosclerotic Vascular Disease** or **ASVD**)
- the condition in which an artery wall thickens as the result of a build-up of fatty materials such as cholesterol
- affecting arterial blood vessels, a chronic inflammatory response in the walls of arteries

ATHEROSCLEROSIS: SYMPTOMS AND SIGNS

Most symptoms of atherosclerosis don't show until a blockage occurs.

Common symptoms include:

- chest pain or angina
- pain in your leg, arm, and anywhere else that has a blocked artery
- shortness of breath
- fatigue
- confusion, which occurs if the blockage affects circulation to your brain
- muscle weakness in your legs from lack of circulation

ATHEROSCLEROSIS: ETIOLOGY

Atherosclerosis starts with damage or injury to the inner layer of an artery. The damage may be caused by:

- High blood pressure
- High cholesterol
- An irritant, such as nicotine
- Certain diseases, such as diabetes

ATHEROSCLEROSIS: *PATHOPHYSIOLOGY*

PATHOPHYSIOLOGY

HYPERTENSION/ HIGH

↓

Damage to endothelium (blood vessels): *injury*

↓

Migration of *WBCs (monocytes)*, *platelets and cholesterol* to site of injury

↓

WBCs (monocytes), *platelets and cholesterol* gets stick or adhere to the injured site of blood vessels

↓

Smooth (cardiac or heart) muscle *hypertrophy*

↓

Formation of *Plaque*

↓

Stabilization of plaque formation

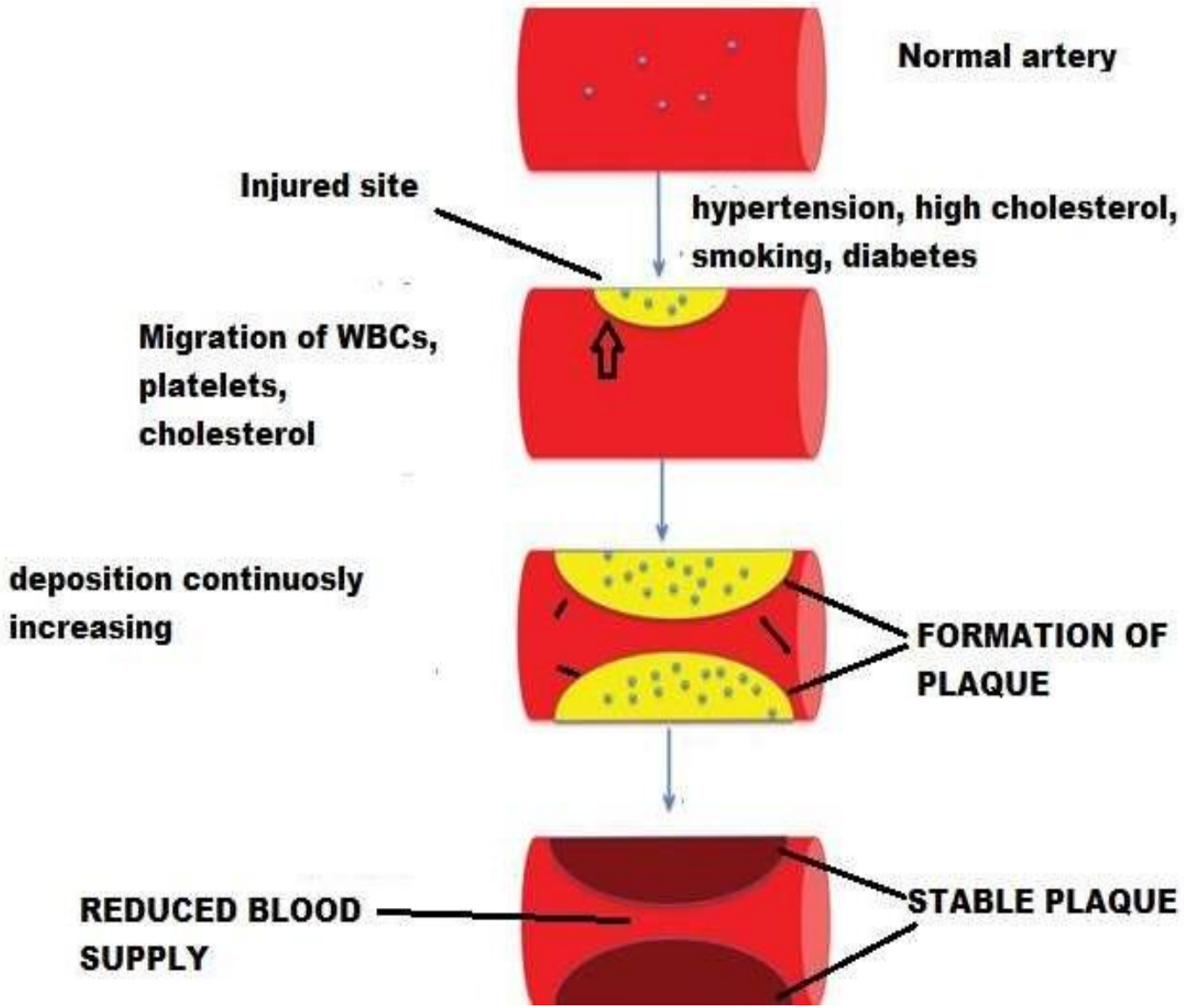
↓

Reduced blood supply

↓

Complete Atherosclerosis

ATHEROSCLEROSIS: *PATHOPHYSIOLOGY*



ATHEROSCLEROSIS: *DIAGNOSIS*

- a **blood test** to check your cholesterol levels
- a Doppler ultrasound- shows artery picture
- magnetic resonance angiography (MRA) or computed tomography angiography (CTA) to create pictures of the large arteries in your body
- cardiac angiogram, which requires an injection of a radioactive dye that can be seen on X-rays to create a picture of the arteries in your heart
- an electrocardiogram (EKG), which measures the electrical activity in your heart to look for any areas of decreased blood flow
- a stress test, or exercise tolerance test, which monitors your heart rate and blood pressure while you exercise on a treadmill or stationary bicycle

ATHEROSCLEROSIS: *PREVENTION*

Primary prevention of atherosclerosis

- Cessation of cigarette smoking
- Control of hypertension
- Weight loss
- Exercise, and lowering total and LDL blood cholesterol levels while increasing HDL (e.g., by diet or through statins).

ATHEROSCLEROSIS: *TREATMENT*

1. ANTI-PLATELETS DRUGS

e.g. aspirin

2. ANTI-HYPERLIPIDEMICS

e.g. atorvastatin

3. SURGICAL PREVENTION

Artery bypass surgery

2.

ANGINA PECTORIS

ANGINA PECTORIS: *INTRODUCTION*

Angina Pectoris

Angina or ankhon = Pain/ strangling

Pectis = Chest

Angina Pectoris

ANGINA PECTORIS: *INTRODUCTION*

ANGINA is a complex symptom developed due to the reduced blood supply to heart.

It is defined as the pain in chest develops towards left arm, shoulder, lower jaw to the heart (chest).

ANGINA PECTORIS: *INTRODUCTION*

Types of Angina

- **Stable angina** occurs when increased physical activity (e.g., hurrying across a street or climbing a long stairs) which creates a greater demand for oxygen-rich blood to reach heart tissue.
- **Unstable angina** occurs with lesser degrees of exertion or while at rest. Unstable angina that occurs at rest is the most serious form. This type usually is caused by the formation of a blood clot at the site of a ruptured plaque in a coronary artery.

ANGINA PECTORIS:

Risk factors :

- Age
- Obesity
- Smoking
- Diabetes
- Hypertension
- Renal dysfunction

Age :-

For men >55 yrs and >65 for women

ANGINA PECTORIS: *Symptoms*

- Dyspnea
- Sweating/ diaphoresis
- Faintness
- Palpitations
- Dizziness
- Indigestive disturbances

ANGINA PECTORIS

HYPERTENSION/ HIGH CHOLESTEROL/NICOTINE/DIABETES

↓

Damage to endothelium (blood vessels): *injury*

↓

Migration of *WBCs (monocytes)*, *platelets and cholesterol* to site of injury

↓

WBCs (monocytes), *platelets and cholesterol* gets stick or adhere to the injured site of blood vessels

↓

Smooth (cardiac or heart) muscle *hypertrophy*

Formation of *Plaque* ↓

Stabilization of plaque formation

↓

Reduced blood supply in artery

↓

Atherosclerosis

↓

Imbalance demand and supply of Oxygen (DEMAND increases; SUPPLY decreases) in heart

↓

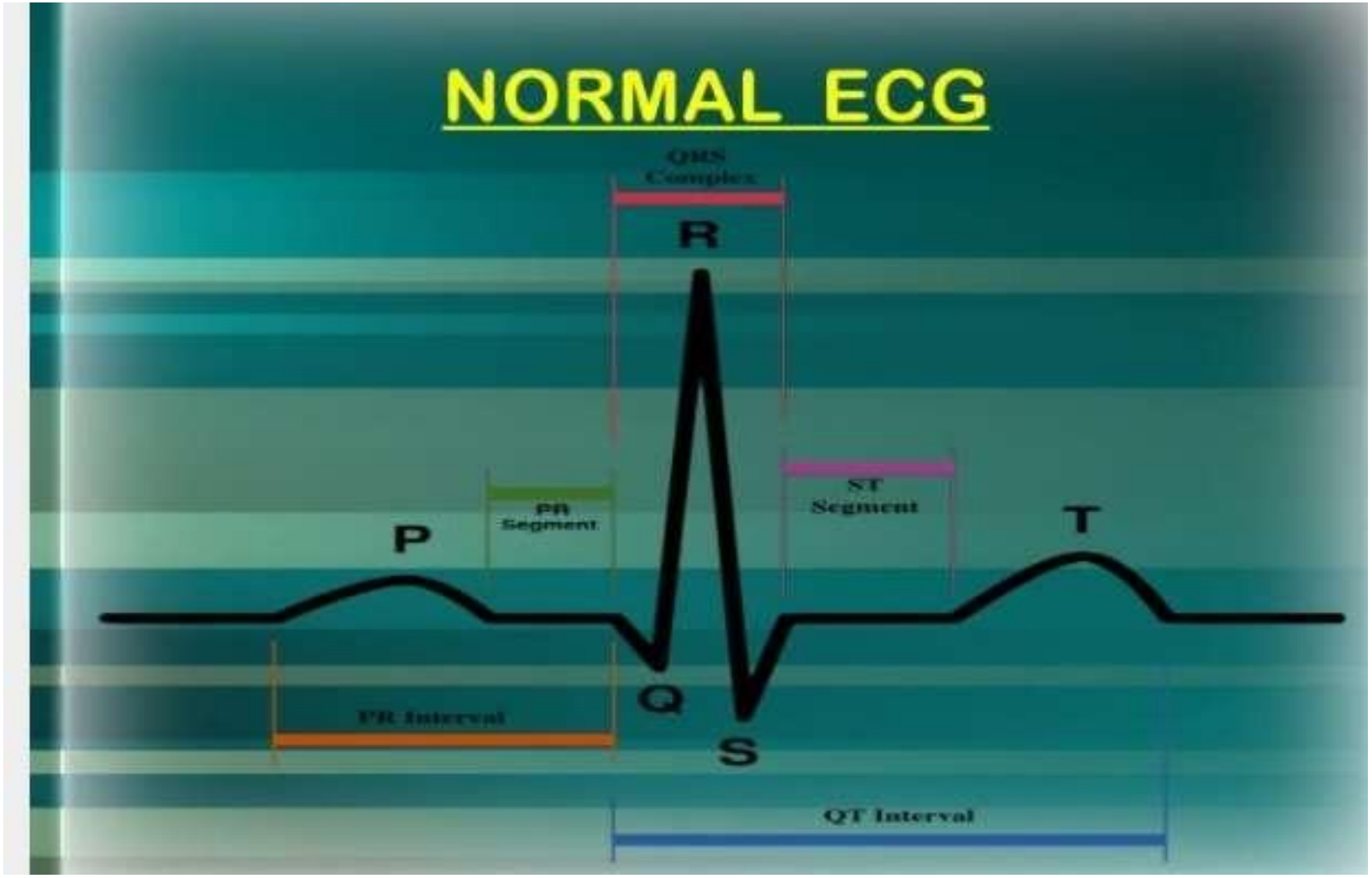
LOAD on heart increases (Unable to meet the LOAD)

↓

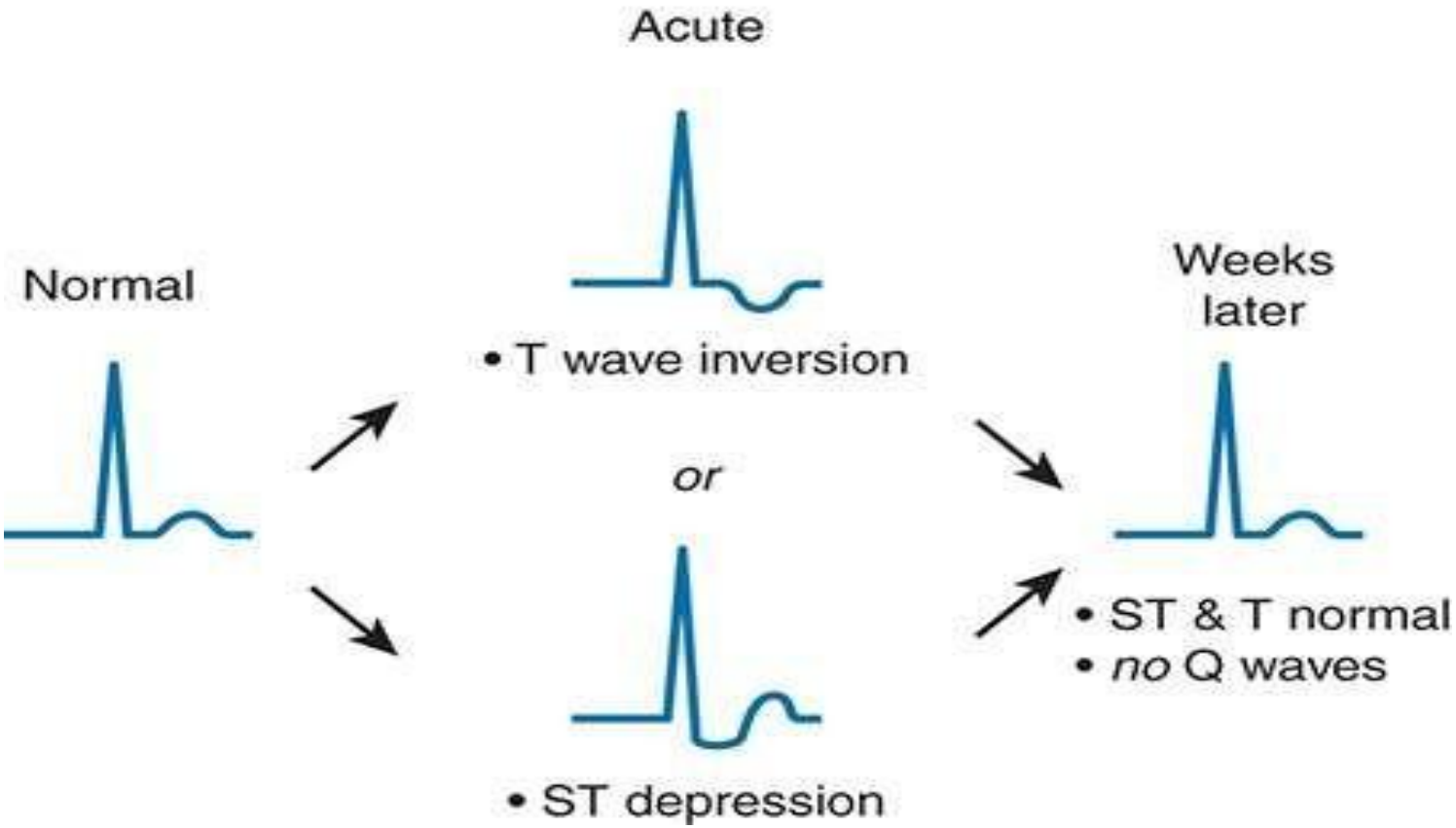
CHEST PAIN (ANGINA)

ANGINA:*DIAGNOSIS*

1. ECG (ELECTROCARDIOGRAM):



Unstable Angina/Non–ST-Elevation Myocardial Infarction



ANGINA:*DIAGNOSIS*

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ANGINA:*PREVENTION*

Primary prevention of atherosclerosis

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- Control of hypertension
- Weight loss
- Exercise, and lowering total and LDL blood cholesterol levels while increasing HDL (e.g., by diet or through statins).

ANGINA:*TREATMENT*

1. ANTI-PLATELETS DRUGS

e.g. aspirin

2. ANTI-HYPERLIPIDEMICS

e.g. atorvastatin

3.SURGICAL PREVENTION

Artery bypass surgery

4. Anti-anginal drugs

Isosorbide dinitrate (SORBITRATE)

3.

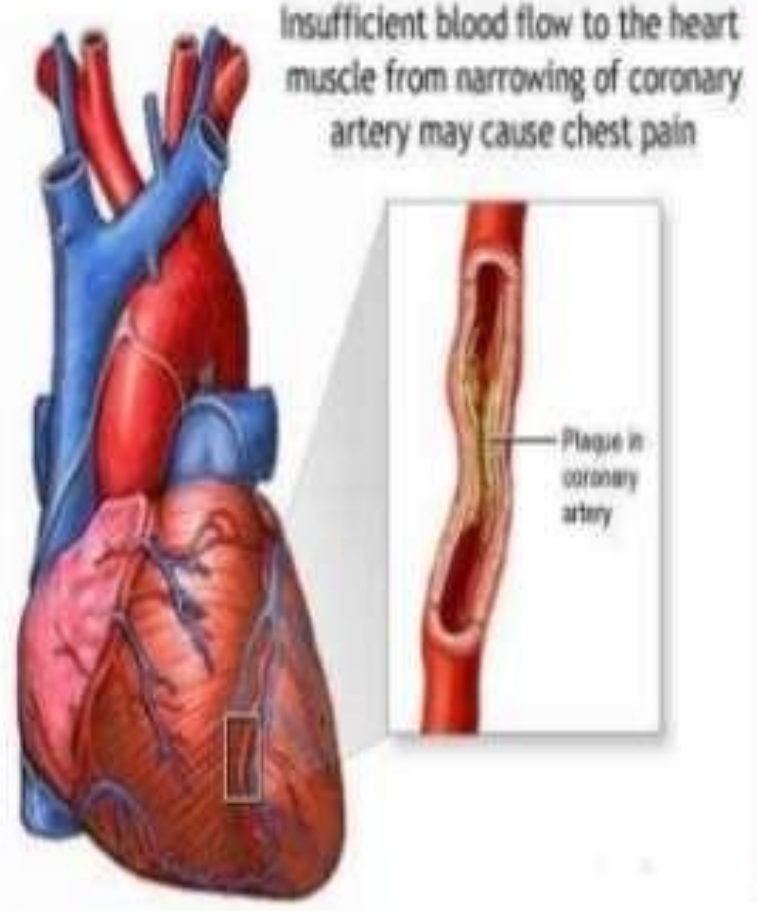
MYOCARDIAL INFARCTION (MI)

MYOCARDIAL INFARCTION: *Introduction*

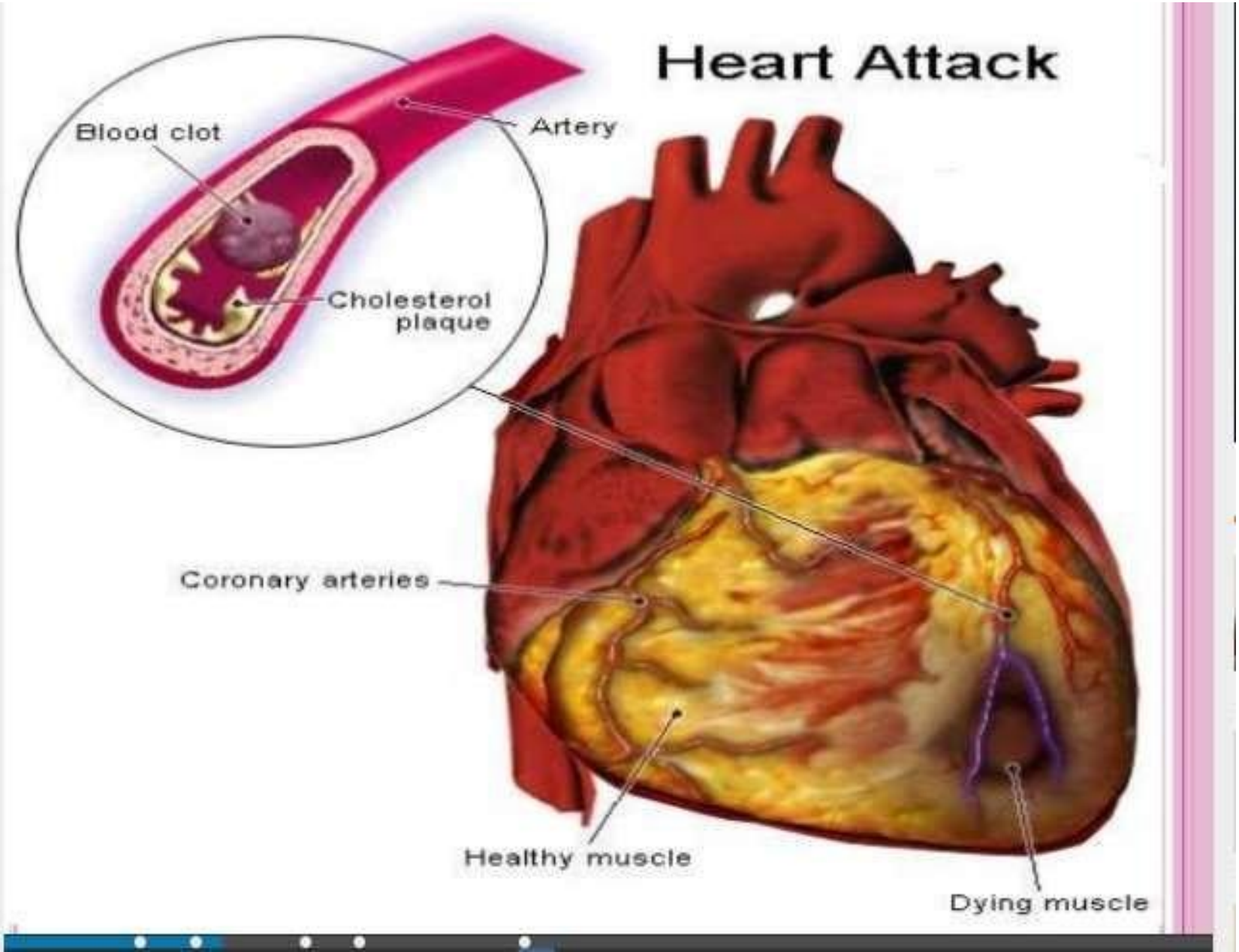
MI is defined as a diseased condition which is caused by **reduced blood flow** in a coronary artery due to atherosclerosis

OR

MI or heart attack is the irreversible damage of myocardial tissue caused by prolonged **ischaemia** & **hypoxia.**



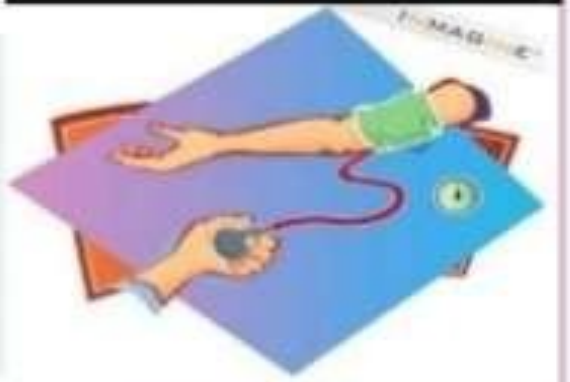
MYOCARDIAL INFARCTION: *Introduction*



MYOCARDIAL INFARCTION: *Etiology*

ETIOLOGY

- Tobacco smoking
- Hypertension
- Drug abuse
- Obesity
- Stress
- Alcohol



MYOCARDIAL INFARCTION: *symptoms*

symptoms

CLINICAL MANIFESTATIONS:

- Chest pain / chest discomfort
- Dyspnea
- Fatigue
- Other symptoms include:
  - Increased sweating
  - Weakness
  - Nausea
  - Vomiting
  - Light-headedness
  - Palpitation
- Anxiety, sleeplessness, hypertension or hypotension, arrhythmia.

- Chest pain is less in women, their common symptoms are weakness, fatigue & dyspnea.

MYOCARDIAL INFARCTION: Pathophysiology

Pathophysiology

HYPERTENSION/ HIGH CHOLESTEROL/NICOTINE/DIABETES

Damage to endothelium (blood vessels): *injury*

Migration of *WBCs (monocytes*), *platelets and cholesterol* to site of injury

WBCs (monocytes), *platelets and cholesterol* gets stick or adhere to the injured site of blood vessels

Smooth (cardiac or heart) muscle *hypertrophy*

Formation of *Plaque*

Stabilization of plaque formation

Reduced blood supply in artery

Atherosclerosis

Imbalance demand and supply of Oxygen (DEMAND increases; SUPPLY decreases) in heart

LOAD on heart increases (Unable to meet the LOAD)

ANGINA → ~~***Permanent clot***~~ ***NECROSIS*** → → ***MI(HEART ATTACK)***

UNIT –II

RESPIRATORY DISORDERS

ASTHMA

ASTHMA: *Introduction*

Asthma is a common chronic inflammatory disease of the airways of the lungs.

Types of Asthma

1. **Allergic asthma:** roaches, pollens and pet dander.

1. **Exercise induced asthma:** any type of physical exertion or sports leads to coughing, difficulty breathing .

ASTHMA: *Symptoms*

- Wheezing (whistling)
- breathlessness,
- chest tightness,
- coughing
- difficulty speaking.

ASTHMA: Etiology

the exact cause of asthma is not known

Common Asthma Triggers

Extrinsic (Allergic) Triggers:

- Dust mites
- Mould
- Certain foods
- Animal dander
- Pollen

Intrinsic (Non-Allergic) Triggers:

- Exercise
- Infections (cold and flu)
- Cold or humid air
- Intense emotions (ex. Stress)
- Medications (aspirin)
- Hormones
- Air pollution
- Fragrances and chemicals
- Occupational irritants

ASTHMA:

Injurious agent (allergens)

↓

Release of inflammatory

↓

mediators (Histamine,

↓

Leukotrienes)

↓

Hyper secretion of mucus

↓

Broncho-constriction

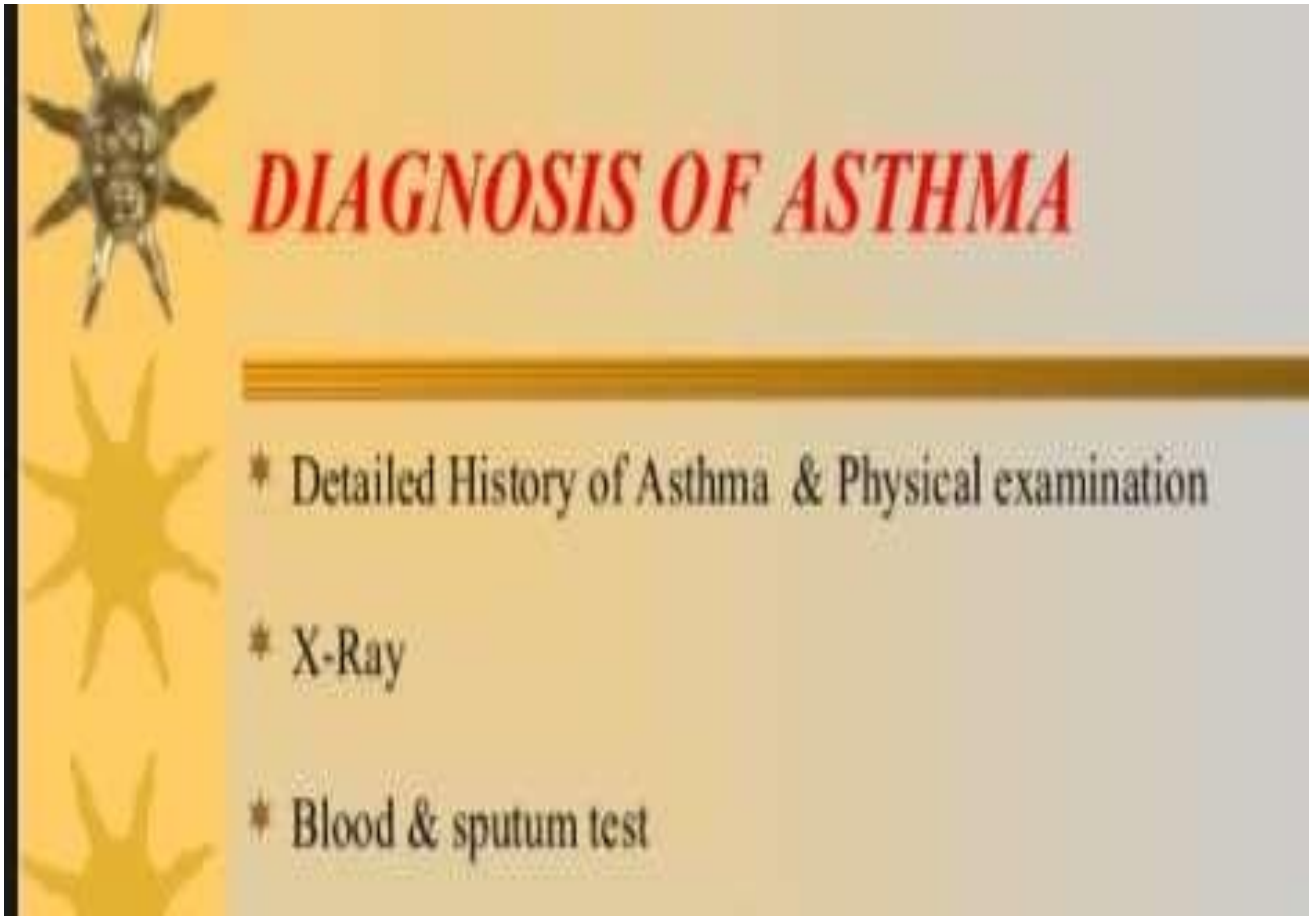
↓

Swelling of bronchial muscles

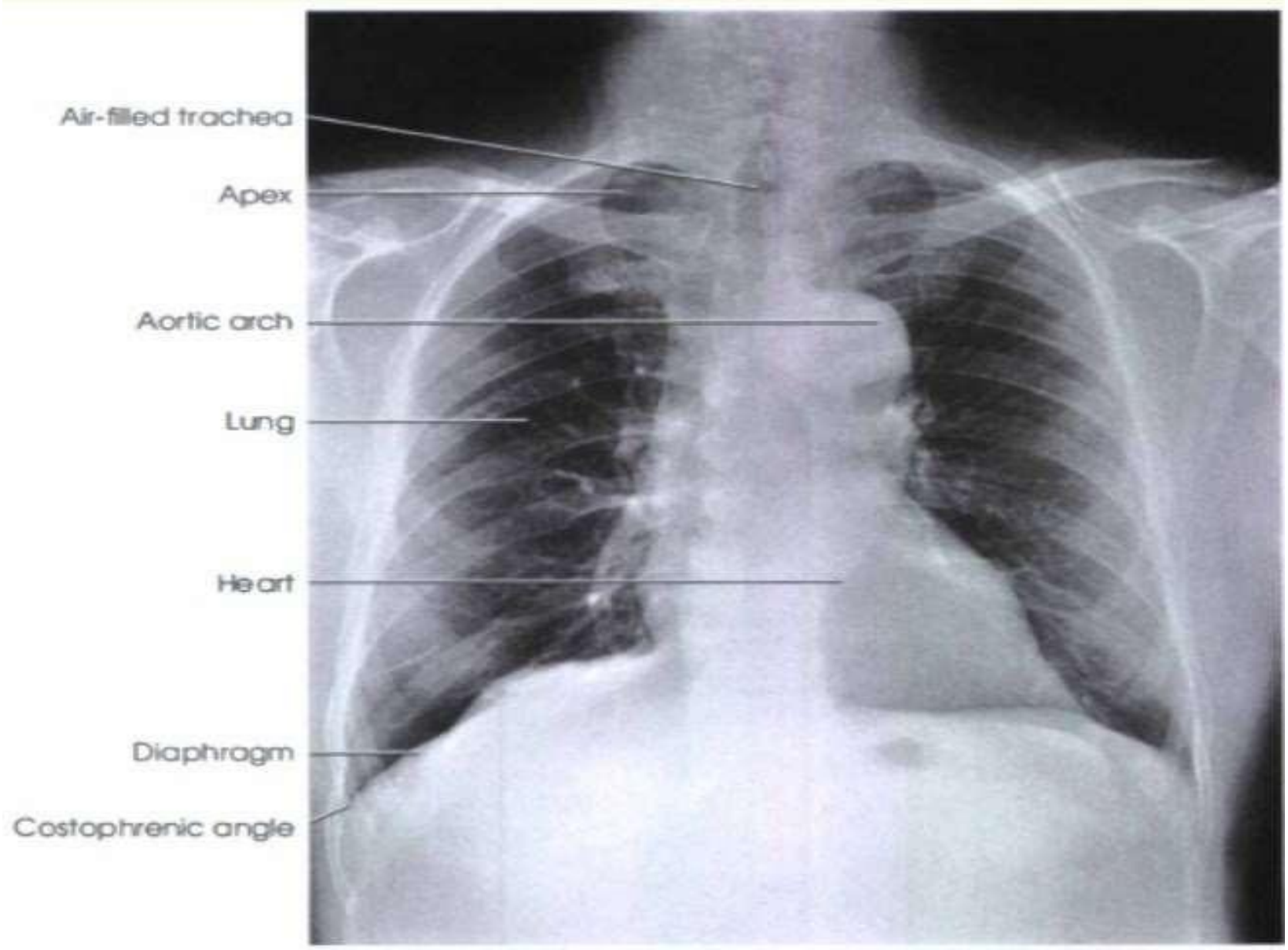
Wheezing, cough, chest congestion,

shortness of breathe (ASTHMA)

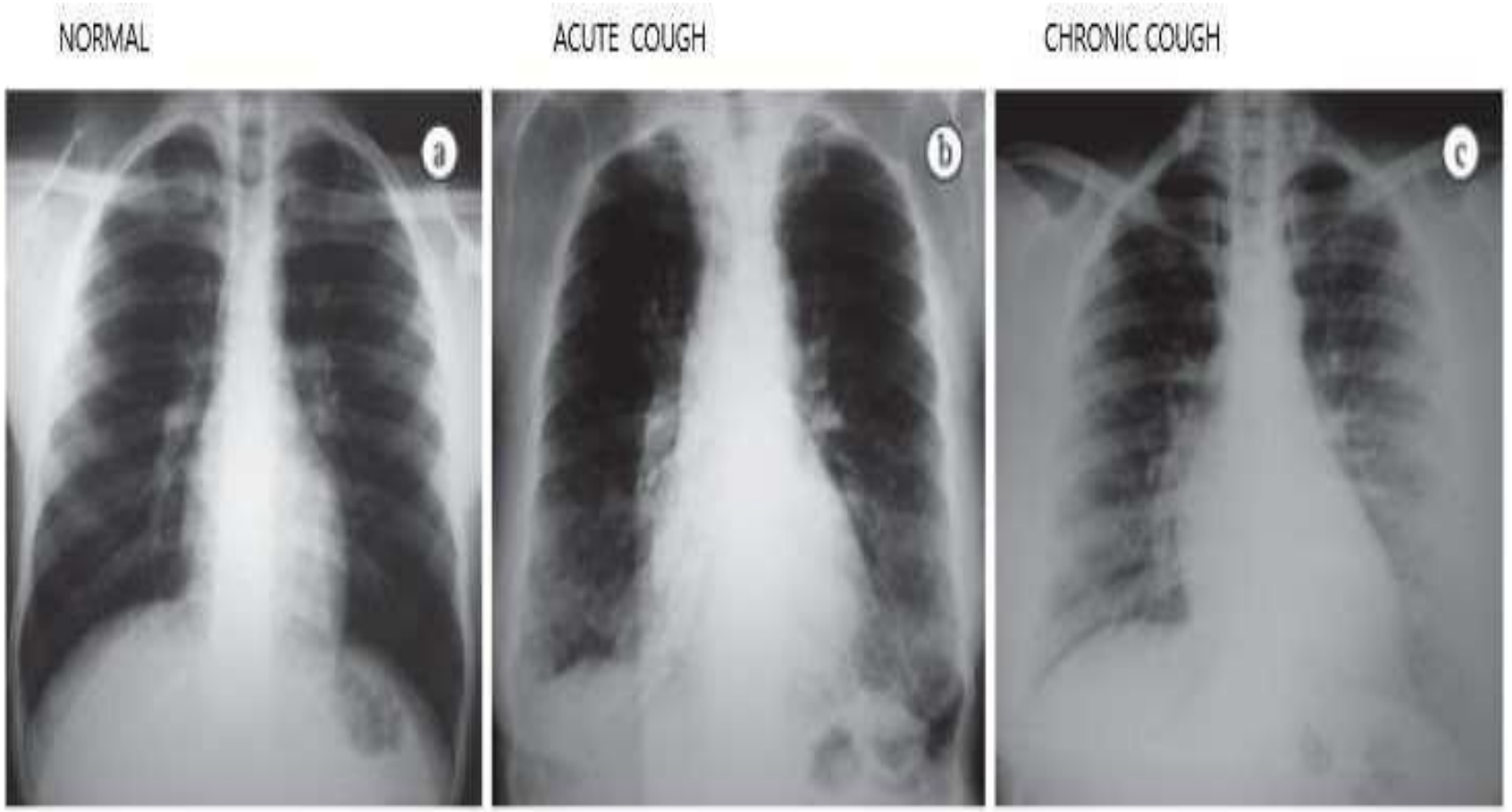
ASTHMA: *Diagnosis*



XRAY CHEST LABEL



X-RAY - CHEST



PREVENTION

- PREVENTION OF ETIOLOGICAL FACTORS
-

TREATMENT

- ANTIASTHMATICS

Theophylline

Montelukast

Salbutamol

Beclamethasone

Inhalers/
Nebulizers/Rotacaps