SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr. M.G.R Medical University, Chennai

DEPARTMENT OF CARDIAC TECHNOLOGY

COURSE NAME : CF & BLS

UNIT : 2

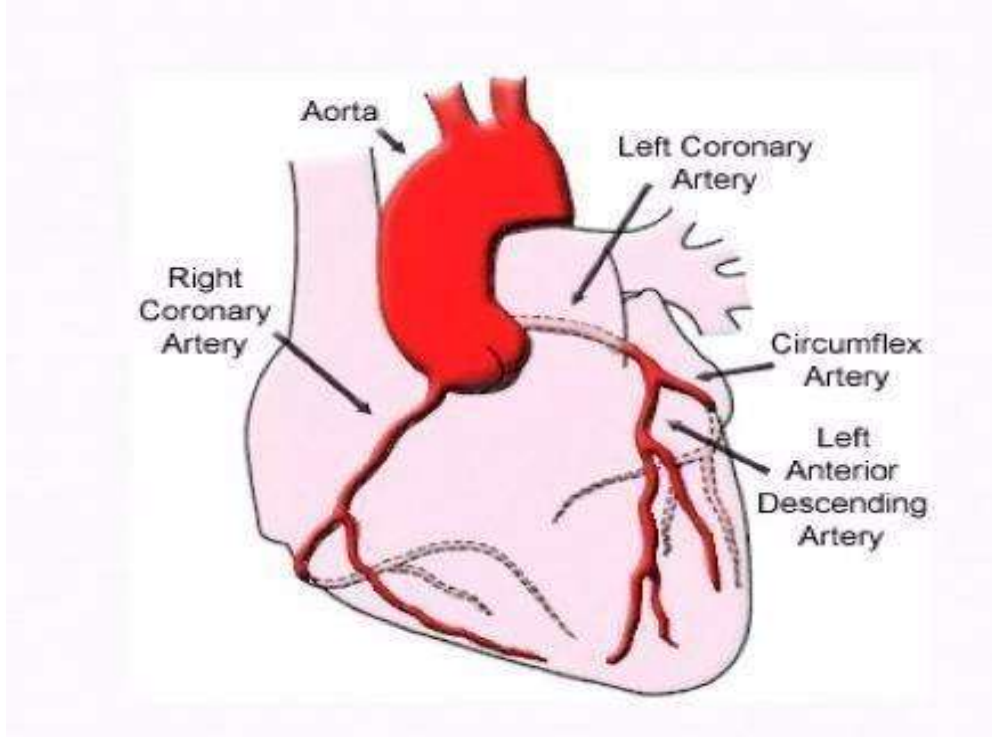
TOPIC : MYOCRDIAL INFRACTION

FACULTY NAME : Ms. HARSHITHA S

Introduction

Myocardial infarction (MI), commonly known as a **heart attack**, is a life-threatening condition caused by **interrupted blood flow to the heart muscle**, leading to **ischemia** and **necrosis** of myocardial tissue.

📌 It is a major cause of morbidity and mortality worldwide.



Definition

Definition

Myocardial Infarction is defined as **irreversible necrosis of heart muscle** due to prolonged **ischemia**, typically resulting from **occlusion of a coronary artery**.

Coronary Artery	Infarct Location
LAD (Left Anterior Descending)	Anterior wall, septum
RCA (Right Coronary Artery)	Inferior wall
LCX (Left Circumflex)	Lateral wall
Left Main	Extensive infarction (anterolateral)

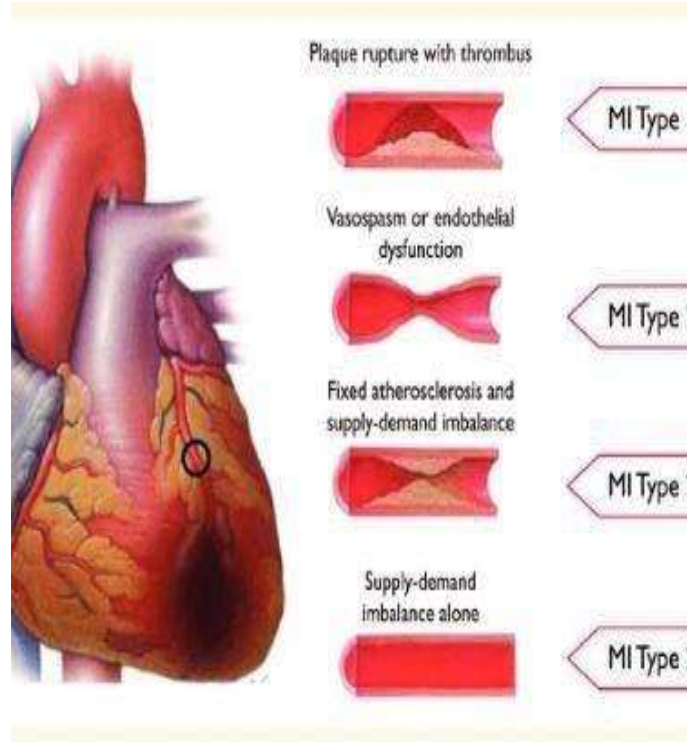
Types of Infarction

1. **ST-Elevation MI (STEMI)**
   - Complete occlusion of a major coronary artery
   - Transmural infarction (full thickness)

2. **Non-ST-Elevation MI (NSTEMI)**
   - Partial occlusion
   - Subendocardial infarction (inner layer only)

3. **Silent MI**
   - No symptoms (seen in diabetics, elderly)

4. **Type 2 MI**
   - Due to increased demand or decreased supply (e.g., anemia, sepsis)

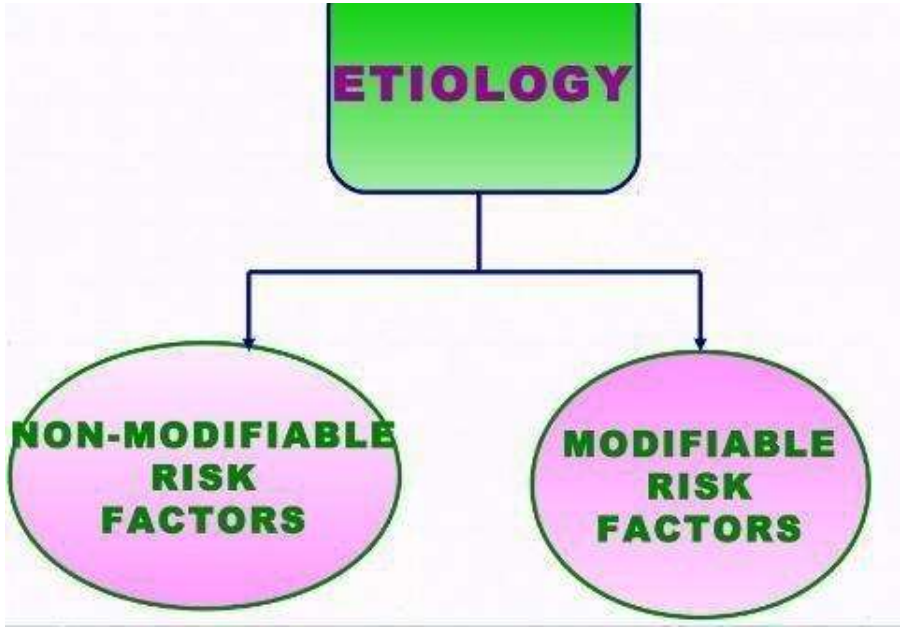


Cardiovascular risk factors

Etiology

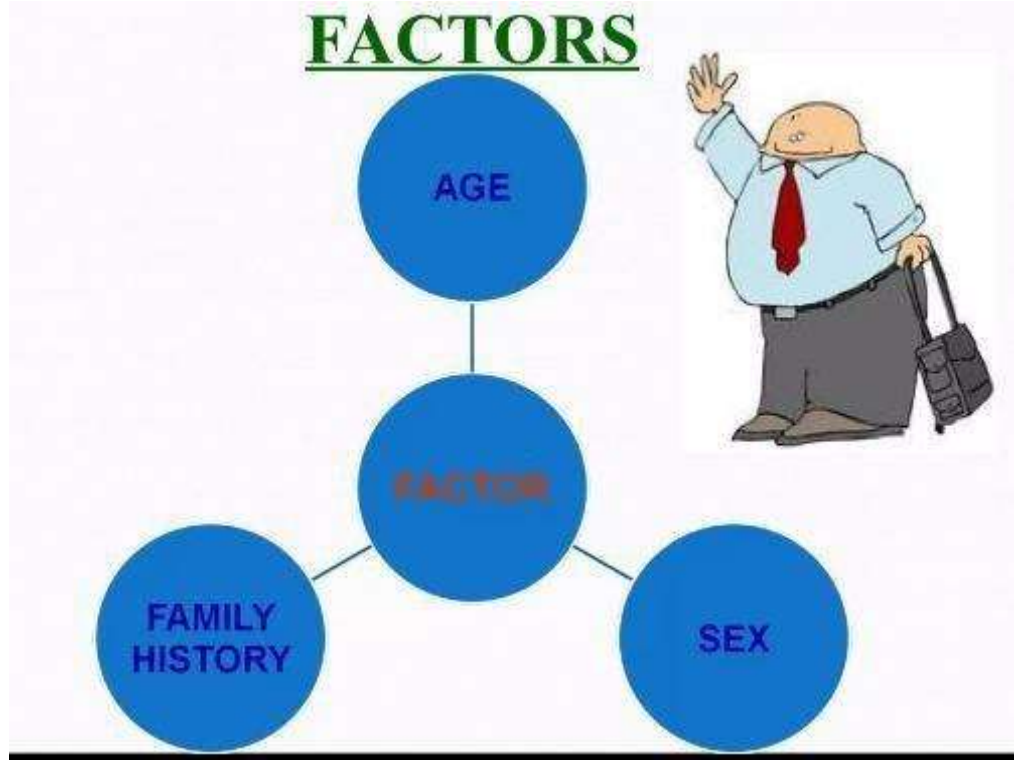
Causes based on 2 types of Risk factors

- Modifiable risk factors
- Non modifiable risk factors



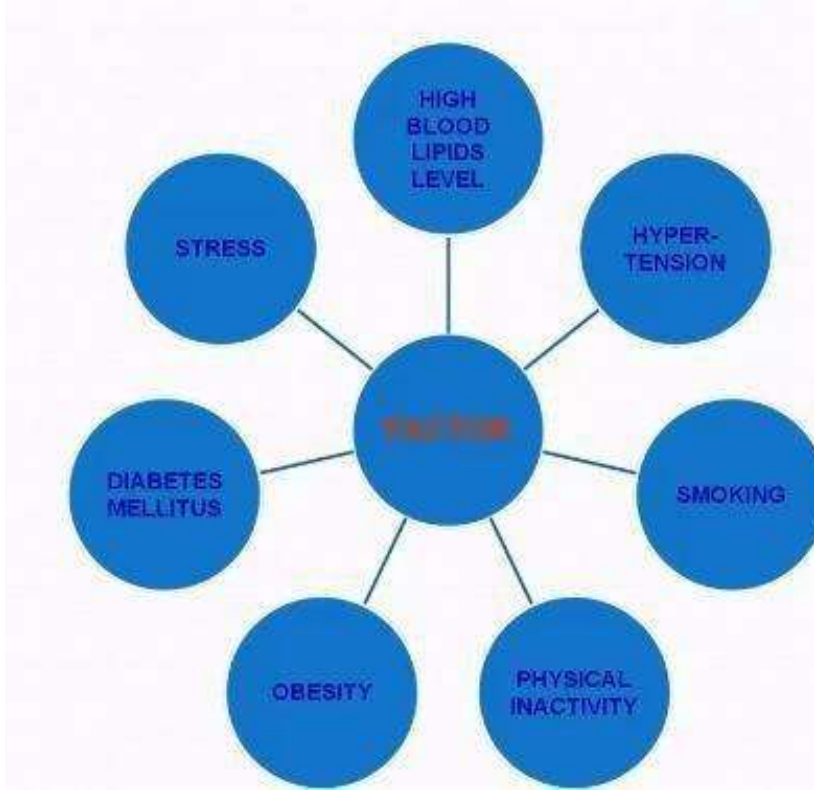
Non modifiable risk factors

- **AGE**: More than 40 years.
- **FAMILY HISTORY**: Myocardial infarction can be inherited from parents to children.
- **GENDER**: Myocardial infarction is 3 times more in men than women.



Modifiable risk factors

- high cholesterol
- high blood pressure
- smoking, diabetes
- Obesity
- physical inactivity and
- poor nutrition.



Pathophysiology of MI

1. **Atherosclerosis** → Plaque rupture
2. **Thrombus formation** → Occlusion of coronary artery
3. **Ischemia** → Lack of oxygen to myocardium
4. **Cell death begins within 20–30 minutes**
5. **Necrosis** spreads from **endocardium to epicardium** over 4–6 hours

Zones:

- **Zone of necrosis** – irreversible cell death
- **Zone of injury** – potentially reversible
- **Zone of ischemia** – minimal damage, can recover

Complications

Complications include:

- Arrhythmia
- Cardiogenic shock (10%)
- Congestive heart failure
  - Thromboembolism
  - Rupture (5%)
  - Cardiac aneurism (5%)
  - Pericarditis

Clinical manifestation

Common manifestations

Chest pain – severe, crushing, retrosternal, radiates to arm/jaw

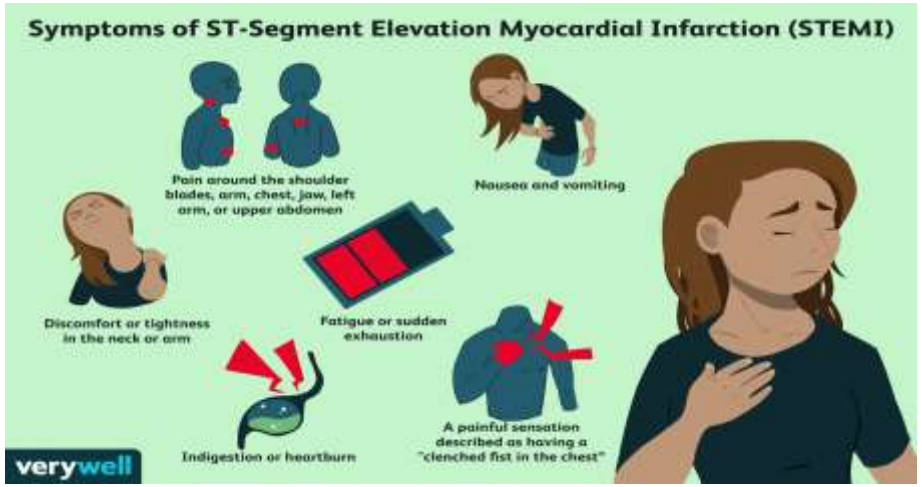
Dyspnea

Sweating (diaphoresis)

Nausea, vomiting

Palpitations, syncope

Silent in diabetics and elderly



CARDIOVASCULAR MANIFESTATIONS

- Hypotension Decrease
- cardiac output
- Shock
- Urine output (Oliguria): <30ml/day.
- Dyspnea

SYMPATHETIC NERVOUS SYSTEM STIMULATION

- Increased catecholamine releases.
- Diaphoresis (perfuse sweating).
- Cold & clammy skin ("cold sweat").

Diagnosis

Clinical signs and symptoms

ECG changes

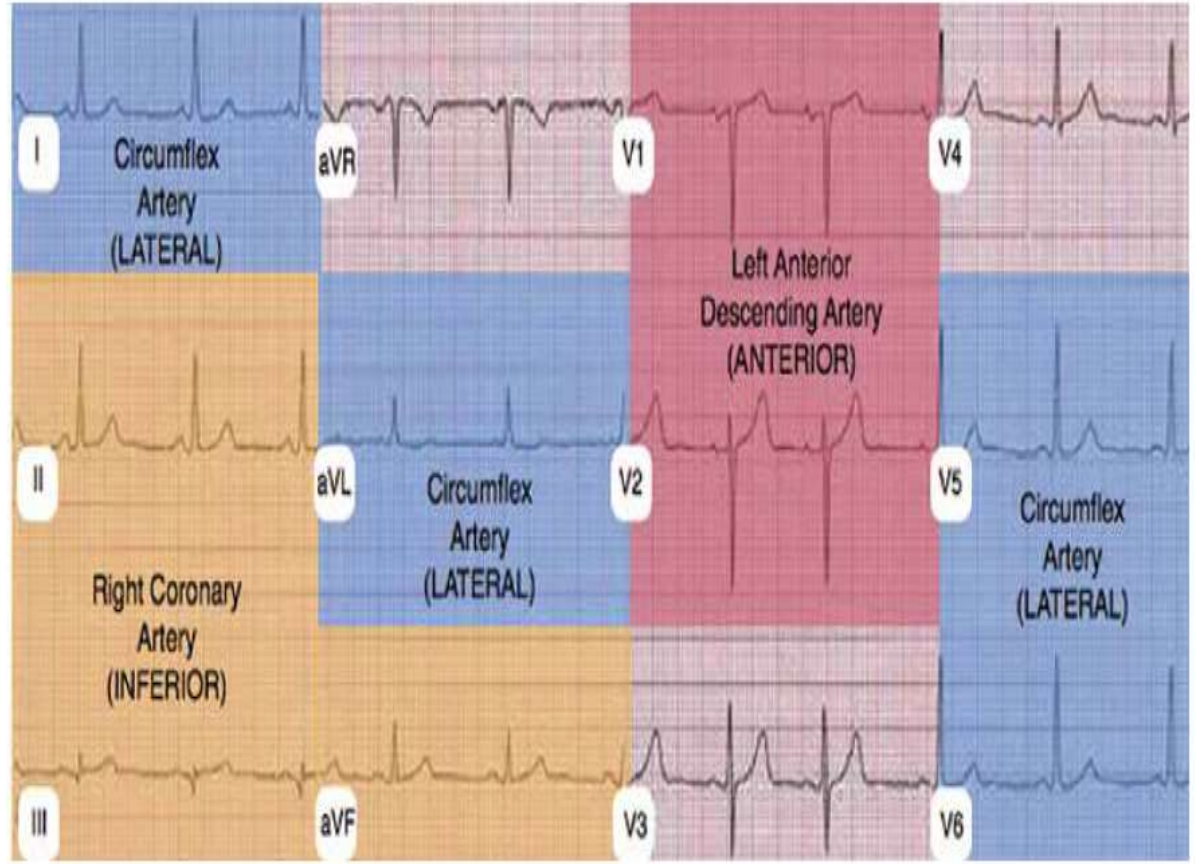
STEMI: ST elevation, Q waves
NSTEMI: ST depression, T wave inversion

Cardiac biomarkers

Troponin I/T (gold standard – rises in 3–4 hrs, lasts 7–10 days)
CK-MB (rises early, returns to normal in 2–3 days)

Echocardiography – wall motion abnormalities

Coronary angiography – to identify blockage



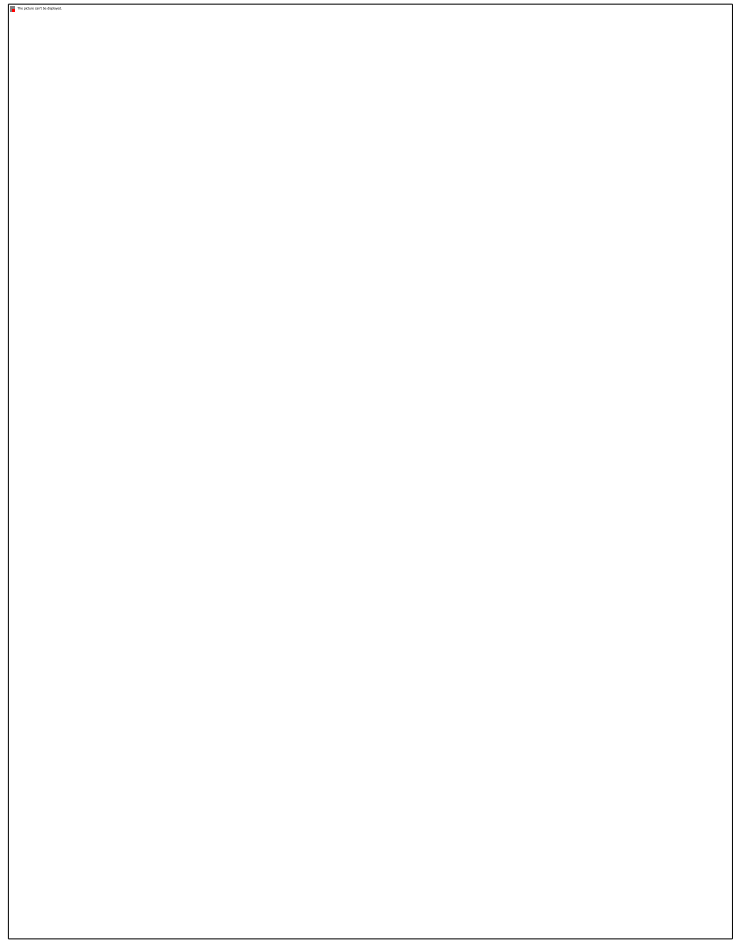
Management of MI

Conservative Management

Rest and monitoring
Oxygen support
Lifestyle changes: smoking cessation, diet, exercise

Medical Treatment

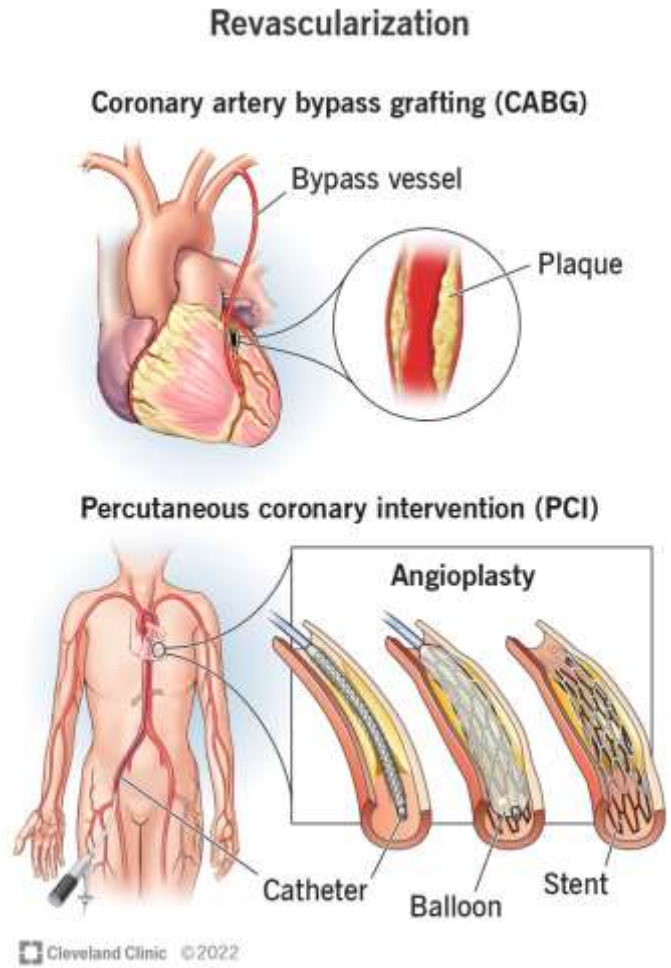
Antiplatelet agents – Aspirin, Clopidogrel
Anticoagulants – Heparin
Nitrates – Vasodilation (e.g., nitroglycerin)
Beta-blockers – Reduce oxygen demand
ACE inhibitors/ARBs – Prevent remodeling
Statins – Lipid-lowering
Pain relief – Morphine if severe



Management

Surgical / Interventional Treatment

1. **Percutaneous Coronary Intervention (PCI)**
   - Angioplasty + stent placement
   - Preferred within 90 minutes of symptom onset
2. **Coronary Artery Bypass Grafting (CABG)**
   - For multi-vessel disease or left main disease
   - Surgical revascularization using grafts (usually saphenous vein or internal mammary artery)



Reference

Ross and willson book of anatomy and physiology

Ashalatha book of anatomy and physiology

https://my.clevelandclinic.org/health/diseases/16818-heart-attack-myocardial-infarction

https://emedicine.medscape.com/article/155919-overview?form=

THANK YOU