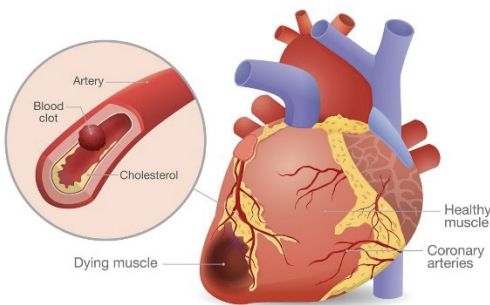


# Myocardial infarction (MI)



Myocardial infarction (MI), commonly known as a heart attack happens when the blood flow delivering oxygen to the heart muscle is drastically reduced or halted. This usually occurs because the coronary arteries, which supply blood to the heart, become thickened and hardened over time due to a buildup of fat, cholesterol, and other substances—collectively known as plaque. This gradual process is called atherosclerosis. If a plaque ruptures and a blood clot forms, blocking the blood flow, a heart attack can result.

Learn how damage to the coronary arteries can lead to a heart attack: <https://watchlearnlive.heart.org/index.php?moduleSelect=hrtatk>

## Causes:

- **Coronary Artery Disease (CAD):** CAD is the most common cause of Myocardial infarction. CAD occurs when the coronary arteries become narrowed or blocked due to the buildup of cholesterol and fatty deposits (atherosclerosis).
- **Blood Clots:** A clot can form on the surface of a ruptured atherosclerotic plaque, blocking blood flow to the heart muscle.
- **Spasm of a Coronary Artery:** Temporary, severe constriction of a coronary artery can also reduce blood flow to the heart muscle.
- **Smoking:** Tobacco use increases the risk of coronary artery disease and the formation of blood clots.
- **Genetics:** A family history of heart disease can increase an individual's risk of having a heart attack.
- **Other conditions:** such as hypertension, diabase, obesity, stress, and a sedentary lifestyle.

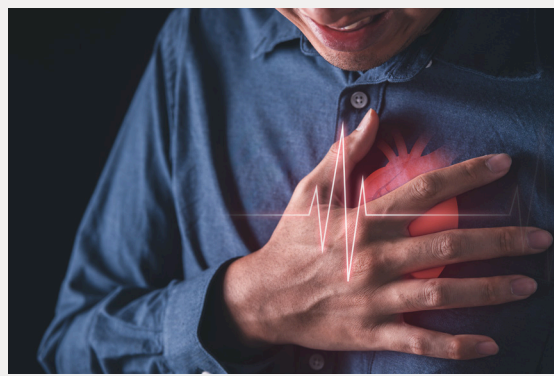
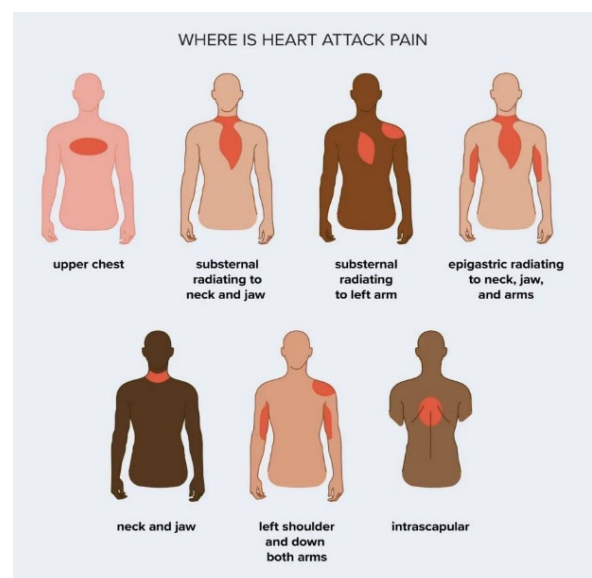
## Symptoms and warning signs:

Heart attack symptoms can vary widely. Some people may experience mild symptoms, while others may have severe ones. In some cases, individuals may have no symptoms at all:

- **Chest Pain:** Often described as pressure, squeezing, fullness, or pain in the centre or the left side of the chest. It may radiate to the arms, neck, jaw or back.
- **Shortness of Breath:** Can occur with or without chest discomfort.
- **Nausea or Vomiting:** Some people experience gastrointestinal symptoms.
- **Sweating:** Cold sweat or clamminess.
- **Fatigue:** Unusual tiredness, particularly in women.
- **Dizziness or Light-headedness:** Feeling faint or dizzy can also occur.

Women may experience atypical symptoms, such as brief or sharp pain in the neck, arm, or back. In some cases, the first sign of a heart attack can be sudden cardiac arrest.

Learn more about: [Heart Attack and Sudden Cardiac Arrest Differences | American Heart Association](#)



## Diagnosis of heart attack:

1. **Electrocardiogram (ECG/EKG):** Records the electrical activity of the heart and can show abnormal patterns indicative of a heart attack.
2. **Blood Tests:** Elevated levels of cardiac biomarkers like troponin, creatine kinase-MB (CK-MB), and myoglobin in the blood can suggest heart muscle damage.
3. **Imaging:** Techniques like echocardiography or cardiac MRI can assess the damage and function of the heart muscle.
4. **Coronary angiogram,** also known as heart catheterisation, is a procedure that uses X-rays and contrast dye to visualise the blood vessels of your heart. It helps identify any potential blockages.

## Treatment

Treating a heart attack focuses on quickly restoring blood flow to the affected heart muscle. This can be done through various methods, such as medication and surgery. The specific treatment plan will usually include several of the following approaches, tailored to the patient's needs:

### Supplementary Oxygen:

Individuals experiencing breathing difficulties or low blood oxygen levels often receive supplemental oxygen as part of their heart attack treatment. Oxygen can be delivered through a tube positioned just below the nose or through a mask covering the nose and mouth. This helps increase the oxygen in your blood and reduces the strain on your heart.

### Medications:

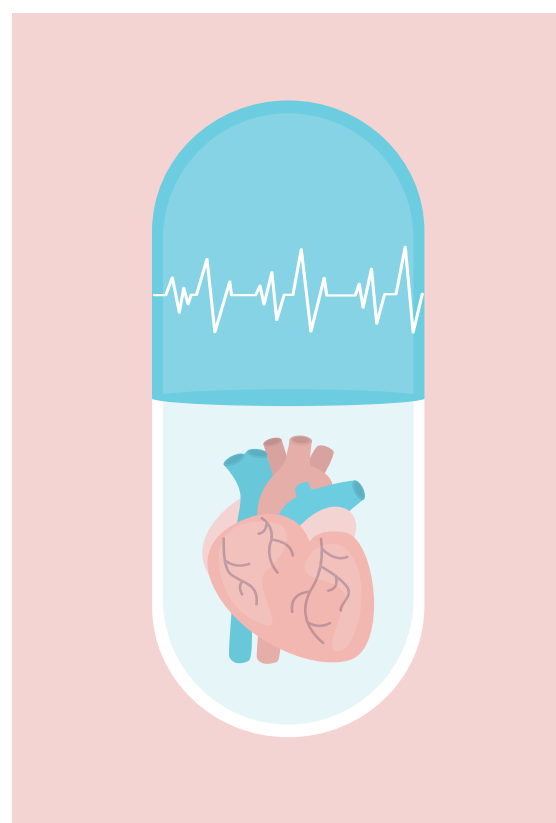
These may include:

- **Aspirin:** Reduces blood clotting.
- **Thrombolytics:** Drugs to dissolve clots (only used in certain cases). Antiplatelet Agents: Such as clopidogrel or ticagrelor to prevent further clotting.
- **Anticoagulants:** To prevent new clots.
- **ACE Inhibitors and ARBs:** Help reduce blood pressure and decrease the strain on the heart.
- **Beta-Blockers:** Lower heart rate and blood pressure, reducing the heart's workload.
- **Statins:** To lower cholesterol levels.

### Interventional Procedures:

- **Angioplasty and Stenting:** A balloon is used to open the blocked artery, and a stent (a small mesh tube) is placed to keep the artery open.
- **Coronary Artery Bypass Grafting (CABG):** Surgery that involves creating a bypass around the blocked artery using a vessel from another part of the body.

Read more: <https://www.heart.org/en/health-topics/heart-attack/treatment-of-a-heart-attack>



## Complications:

Complications from a heart attack are commonly caused by damage to the heart muscle. Potential complications include:

- **Heart Failure:** The heart may not pump effectively after an MI.
- **Arrhythmias:** Abnormal heart rhythms, which can be life-threatening.
- **Cardiogenic Shock:** A condition where the heart suddenly can't pump enough blood to meet the body's needs.
- **Pericarditis:** Inflammation of the lining around the heart.

## To lower your risk of a heart attack, consider these steps:

- **Schedule Regular Checkups:** Visit your primary care provider annually to monitor key health indicators like blood pressure and cholesterol.
- **Quit Tobacco:** Avoid all forms of tobacco and vaping products.
- **Eat Nutritious Foods:** Follow diets like Mediterranean or DASH and focus on plant-based meals over processed foods.
- **Manage Health Conditions:** Keep conditions like high cholesterol, high blood pressure, and diabetes under control.
- **Reduce Stress:** Use stress-reducing techniques such as yoga, deep breathing, or meditation.
- **Take Medications as Prescribed:** Follow your medication regimen consistently.

**Myocardial infarction is a serious medical condition requiring immediate attention. If someone experiences symptoms that could indicate a heart attack, they should seek medical help immediately. Early intervention can significantly improve outcomes and reduce the risk of long-term complications.**

### References:

- <https://www.mayoclinic.org/diseases-conditions/heart-attack/symptoms-causes/syc-20373106>
- <https://www.nhs.uk/conditions/heart-attack/diagnosis/>
- <https://www.ncbi.nlm.nih.gov/books/NBK537076/>