



National University
Heart Centre
Singapore

Know Your Heart

Journey to a Healthy Heart

Educational resources by NUHCS

Outlines

- **Know Your Heart**

- ❖ **What is Coronary Artery Disease (CAD)?**
- ❖ **What is Atherosclerosis?**
- ❖ **Treatments for CAD / Heart Attack**
- ❖ **Risk Factors for Heart Disease**

- Activity Restrictions after a Heart Attack
- Management of Chest Pain
- Heart Medications
- Physical Activity and Cardiac Rehabilitation Program
- Heart Healthy Diet
- Stress Management
- Smoking Cessation

Disclaimer

Information from this section has been adapted from the following:

NUHCS Coronary Angiography and Angioplasty: A Patient's Guide

<https://www.nuhcs.com.sg/Heart-Health/About-Heart-Conditions/Documents/Coronary-Angiography-and-Angioplasty-A-Patient-Guide.pdf>

NUHCS Coronary Artery Bypass Surgery (CABG)

https://www.nuhcs.com.sg/Heart-Health/Documents/Pages/Brochures/767NUHCS_Coronary_Artery_Bypass_Surgery_FA_Online.pdf

NUHCS Your Guide to Heart Surgery

[https://www.nuhcs.com.sg/Heart-Health/Documents/Pages/Brochures/2170NUHCS_NUH_Your_Guide_to_Heart_Surgery_\(English\)_online.pdf](https://www.nuhcs.com.sg/Heart-Health/Documents/Pages/Brochures/2170NUHCS_NUH_Your_Guide_to_Heart_Surgery_(English)_online.pdf)

NUHCS Acute Myocardial Infarction

https://www.youtube.com/watch?v=5u-cRu1S5_4&t=457s

Other resources:

<https://www.heart.org/en/health-topics/heart-attack/treatment-of-a-heart-attack/cardiac-procedures-and-surgeries>

<https://www.moh.gov.sg/docs/librariesprovider5/default-document-library/principal-causes-of-death.xlsx>

Ischemic heart disease (IHD) is the **TOP 3 cause of death** in Singapore.

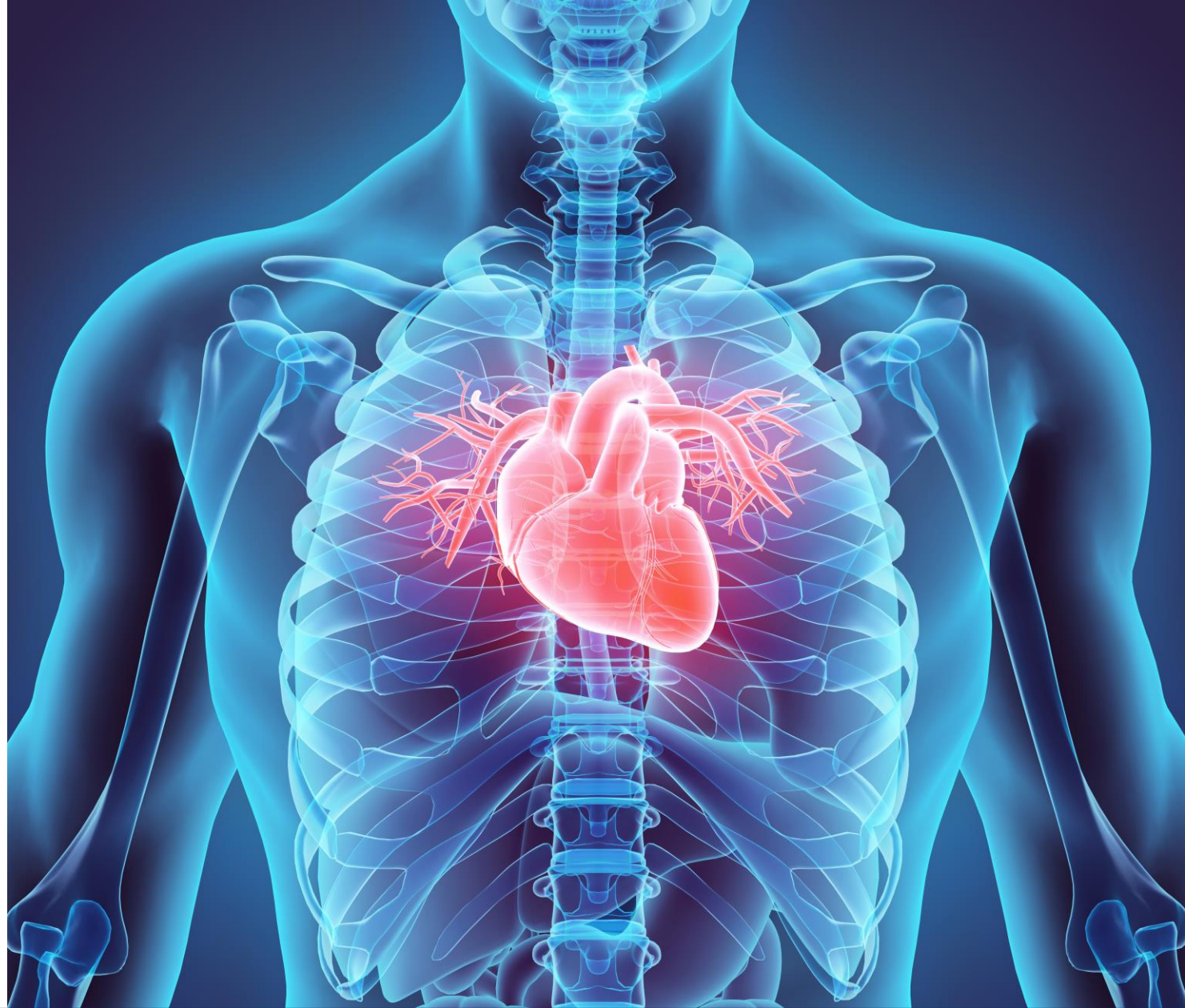
Almost 4000 people die every year from IHD.

PRINCIPAL CAUSES OF DEATH

	2012	2013	2014	2015	2016	2017	2018
• Total No. of Deaths	18,481	18,938	19,393	19,862	20,017	20,905	21,282
• % of Total Deaths							
1. Cancer <i>[ICD10 : C00-C97]</i>	30.1	30.5	29.4	29.7	29.6	29.1	28.8
2. Pneumonia <i>[ICD10 : J12-J18]</i>	16.8	18.5	19.0	19.4	19.3	20.1	20.6
3. Ischaemic heart diseases <i>[ICD10 : I20-I25]</i>	16.1	15.5	16.0	16.7	17.0	18.5	18.1
4. Cerebrovascular diseases <i>(including stroke)</i> <i>[ICD10 : I60-I69]</i>	9.3	8.9	8.4	6.8	6.6	6.3	6.0
5. External causes of morbidity and mortality <i>[ICD10 : V01-Y89]</i>	5.6	4.9	4.7	4.5	4.4	4.0	4.3

Ministry of Health, Singapore

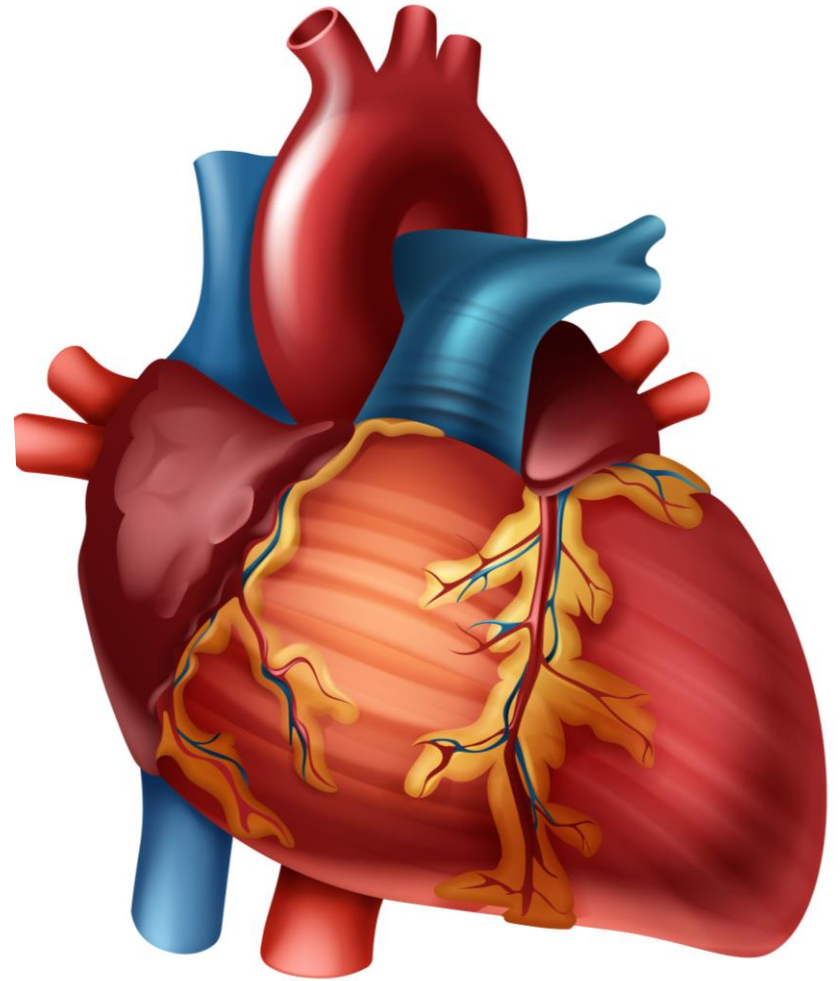
Location of your heart



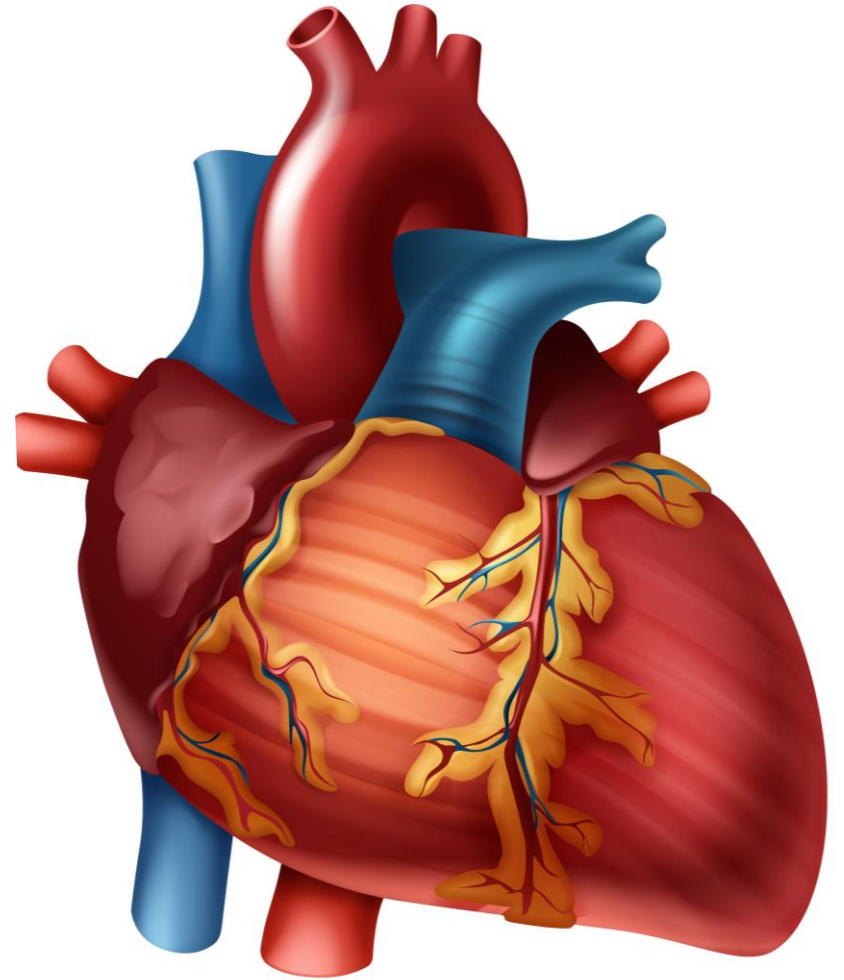
The heart is located between the lungs in the middle of your chest, behind and slightly left of the breastbone.

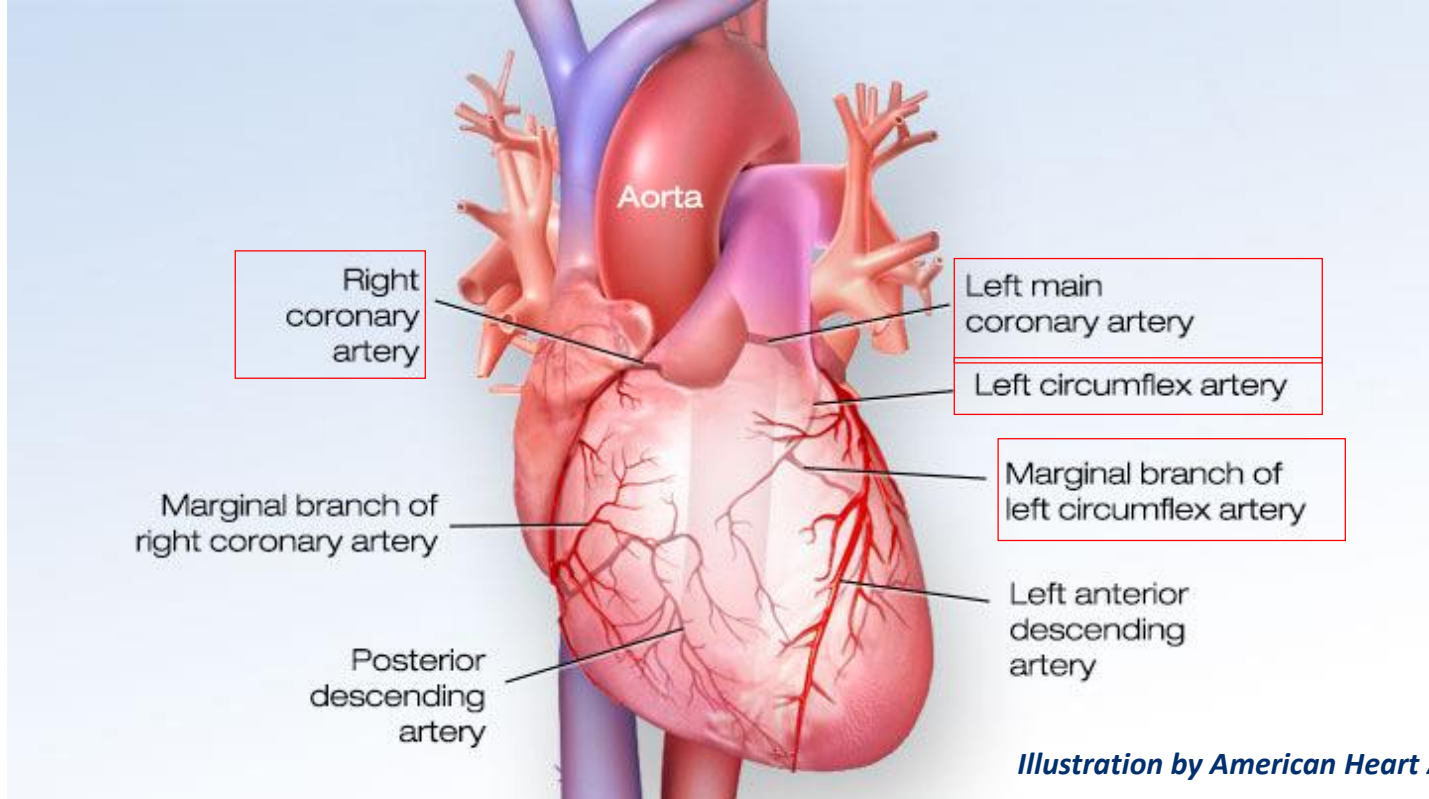
Your Heart – The Hardest Working Muscle

- The heart is a strong, hard-working pump made of muscle tissues.
- It's about the size of a person's fist.



- The heart pumps oxygen-rich blood all around the body.
- After oxygen in the blood is absorbed by the organs in the body, the blood returns to the heart.
- The heart then pumps this oxygen-poor blood to the lungs for them to be enriched again with the oxygen that we breathe in.





Coronary arteries are blood vessels that supply blood to your heart.

The four major coronary arteries:

- Left main coronary artery
- Left anterior descending artery
- Left circumflex artery
- Right coronary artery

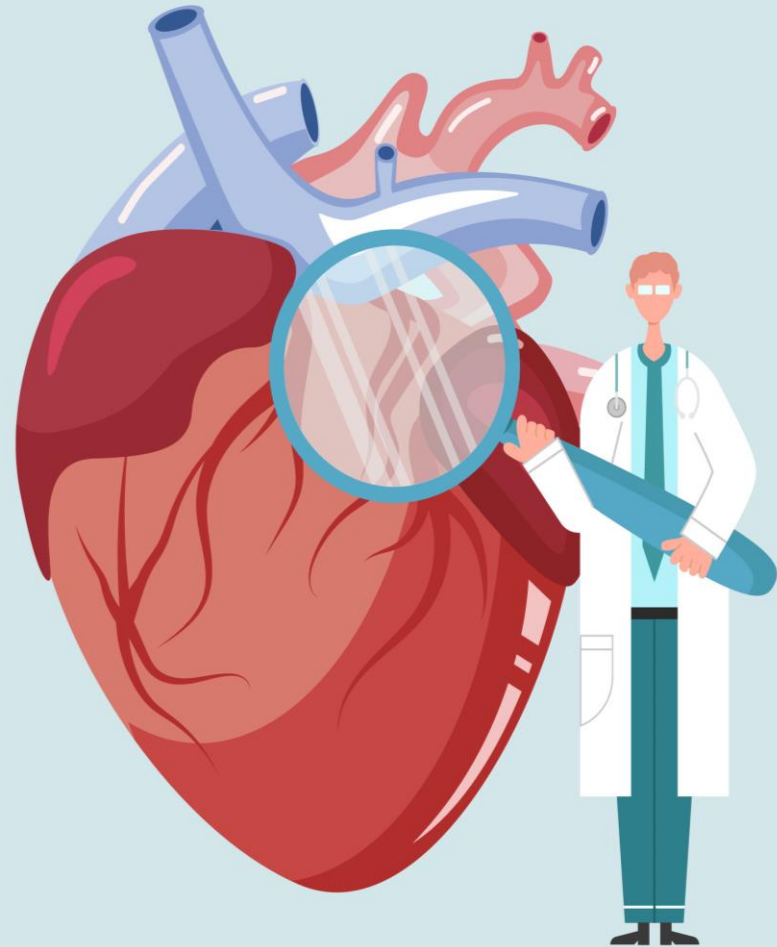
What is Coronary Artery Disease?

Coronary Artery Disease (CAD):

The formation of blockages or atherosclerotic plaques within the coronary artery that result in restricted blood flow to the heart muscle.

Atherosclerosis:

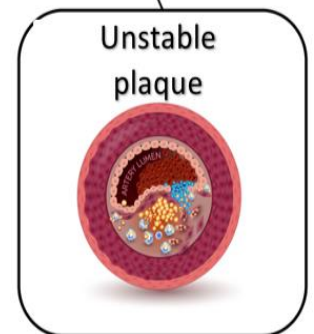
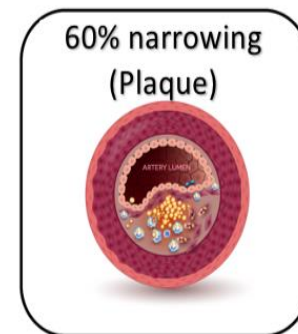
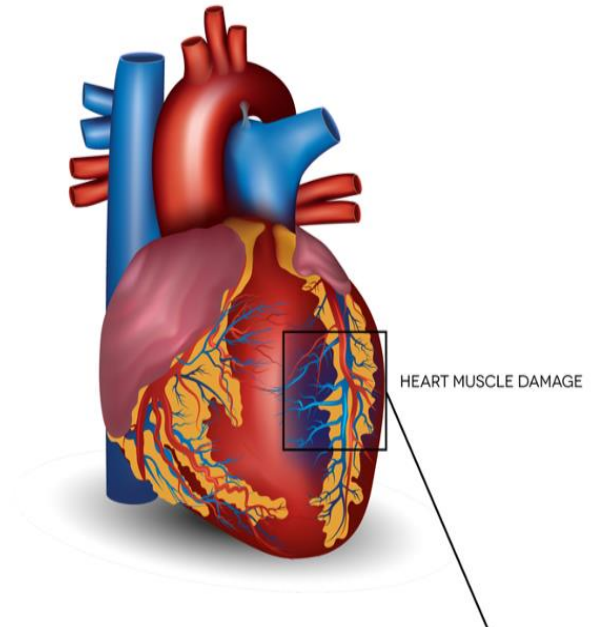
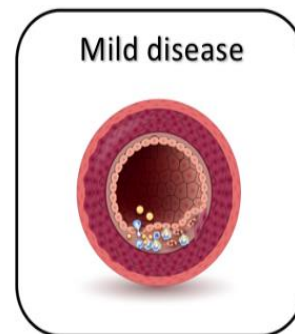
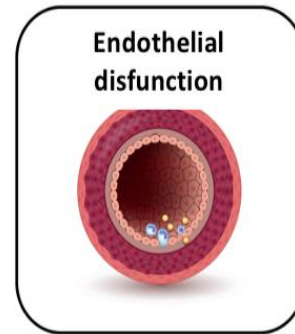
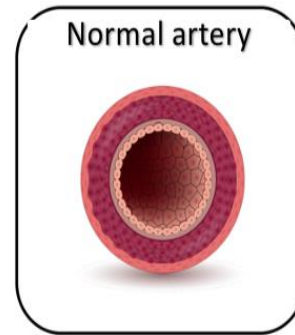
A disease that causes narrowing or blockage of arteries caused by built-up of fat (cholesterol) within the artery wall. The buildup is sometimes referred to as “plaque”.



PROGRESSION OF ATHEROSCLEROSIS

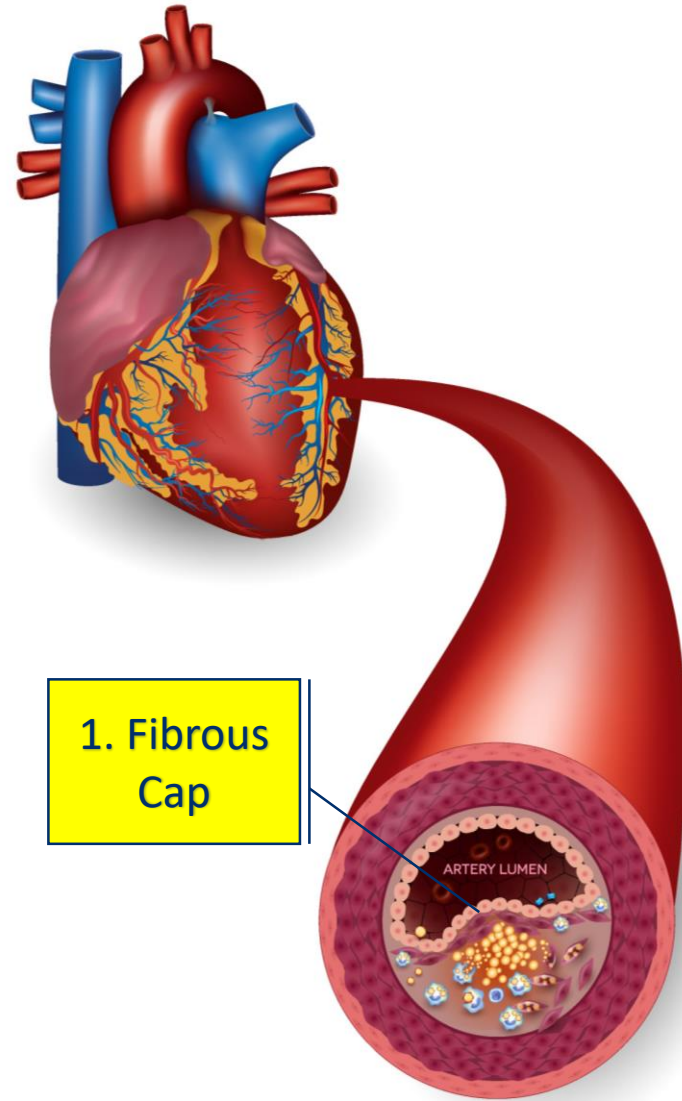
Atherosclerosis

- Atherosclerosis is a disease that causes narrowing or blockage of arteries caused by built-up of fat (cholesterol) within the artery wall. The buildup is sometimes referred to as “plaque”.
- It is a **slow, progressive disease** that may start in childhood and progress rapidly in their 30s. In some cases, it does not become dangerous until the person reaches his/her 50s or 60s.
- Plaque begins when an artery’s inner lining is damaged by following conditions:
 - ❖ High blood cholesterol
 - ❖ High blood pressure
 - ❖ Cigarette smoking



How does a heart attack occur?

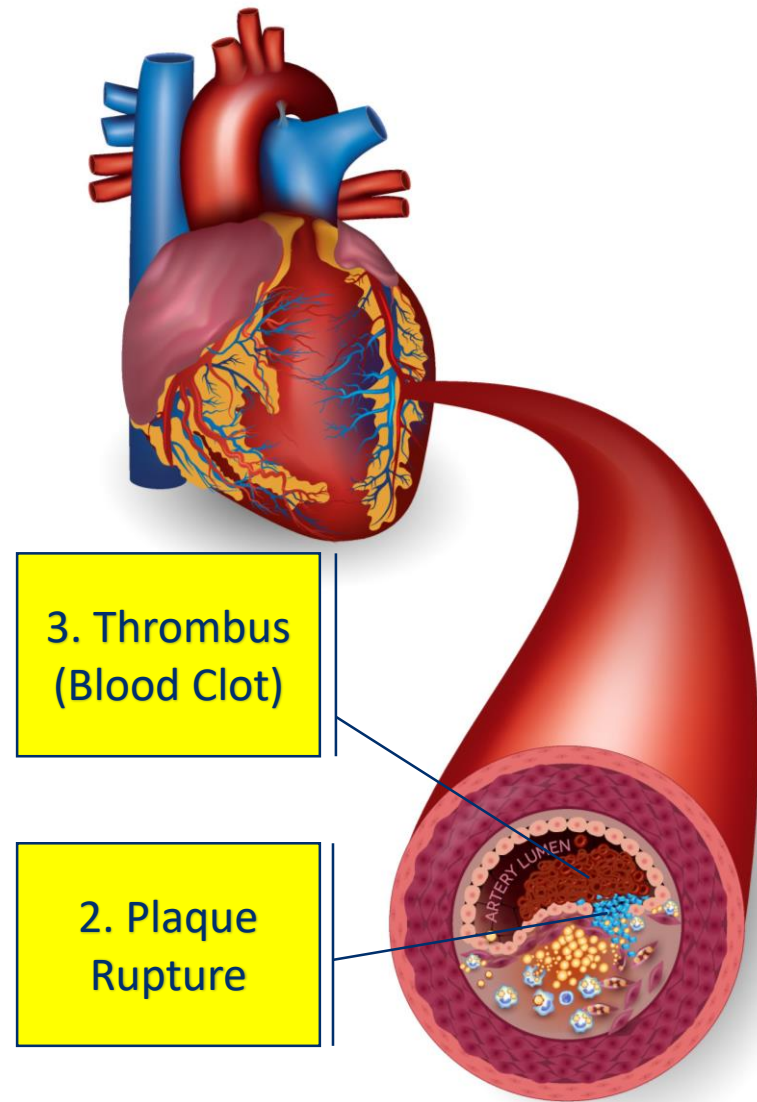
1. An unstable plaque develops with a fatty core and fibrous outer shell.



How does a heart attack occur?

2. Plaque can sometimes rupture into bloodstream.

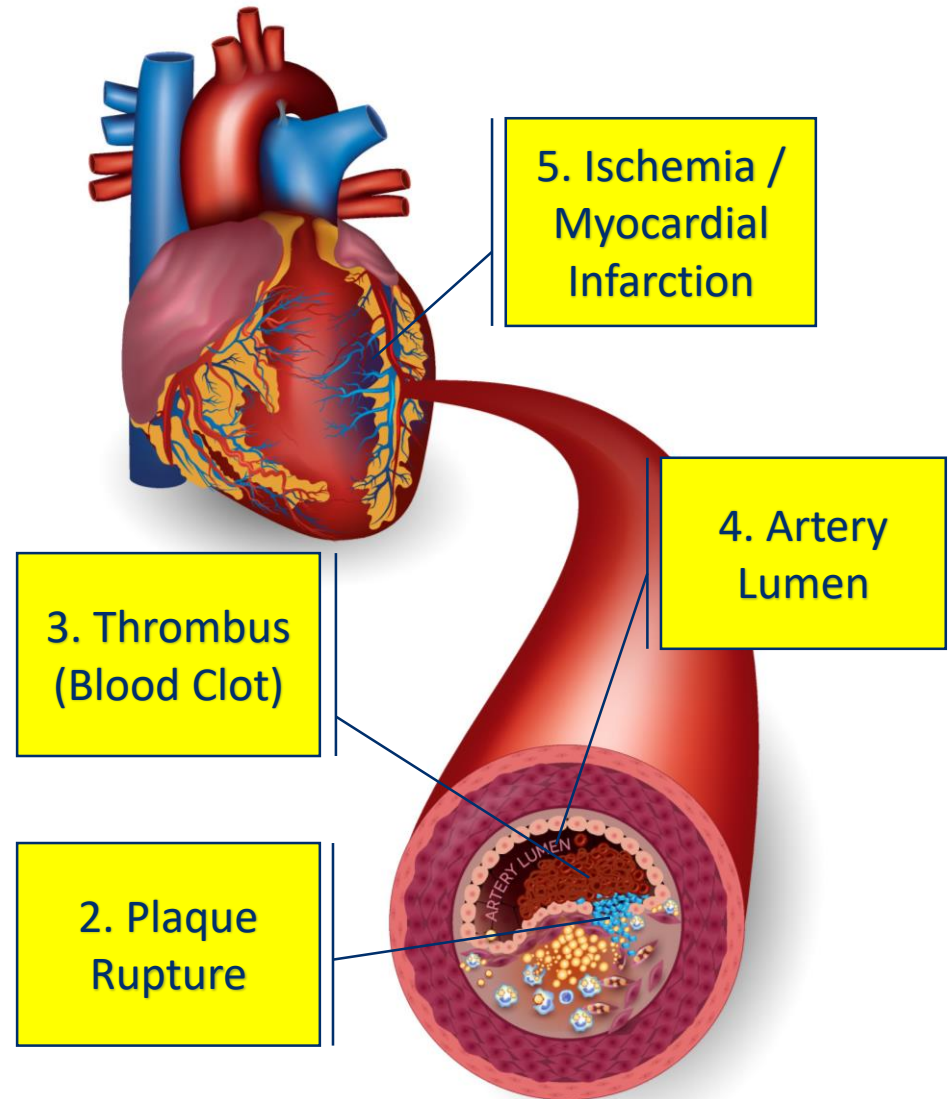
3. Thrombosis (blood clot) begins at the site of plaque rupture.



How does a heart attack occur?

4. As the blood clot gets larger, the amount of blood flowing decreases in artery lumen.

5. When blood clots completely block that artery, it leads to ischemia / myocardial infarction (heart attack).



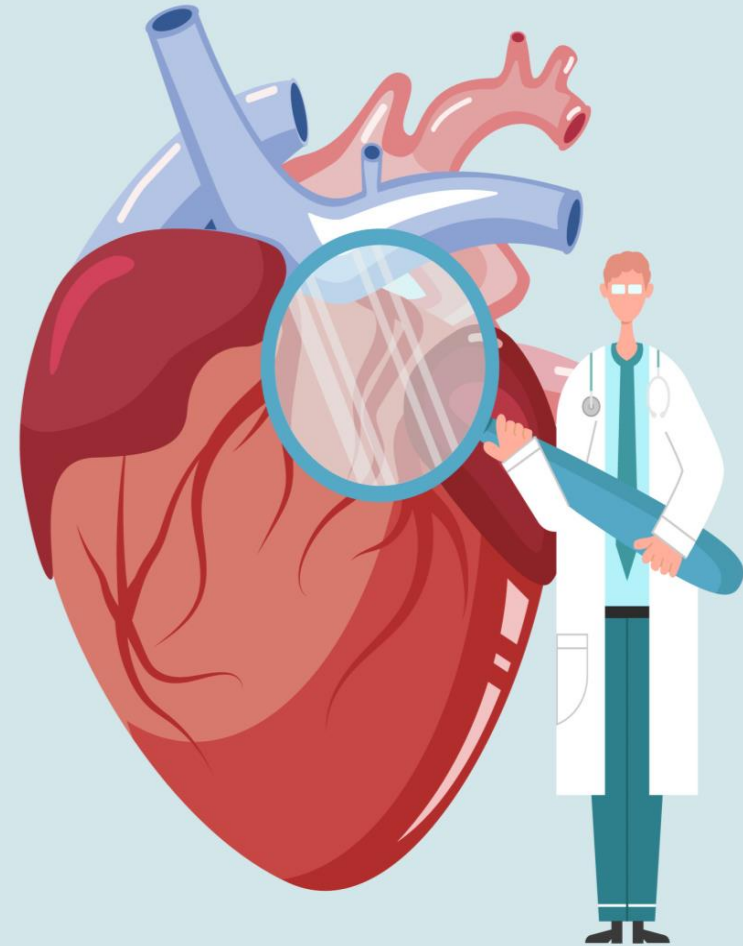
What are Ischemia and Myocardial Infarction ?

Ischemia:

A condition where the **blood flow and oxygen to the heart muscle are reduced**. The heart patient may experience ischemic episodes without knowing it.

Myocardial Infarction:

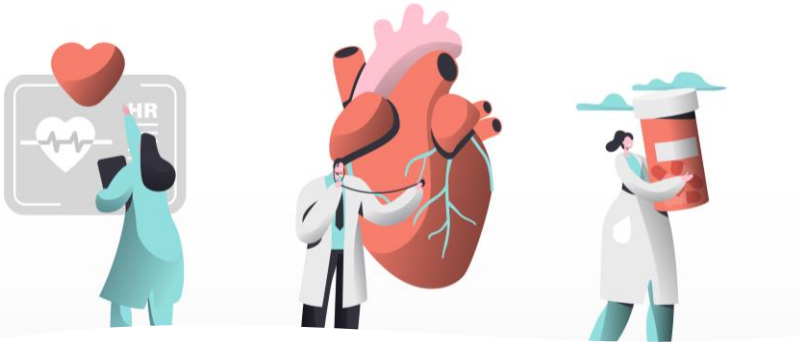
This is the medical term for **heart attack**. There is damage or death to the heart muscle (myocardium) as the blood supply to that area is being blocked.



Treatments for Coronary Artery Disease / Heart Attack

Treatments depend on your heart condition, risk factors and overall wellbeing.

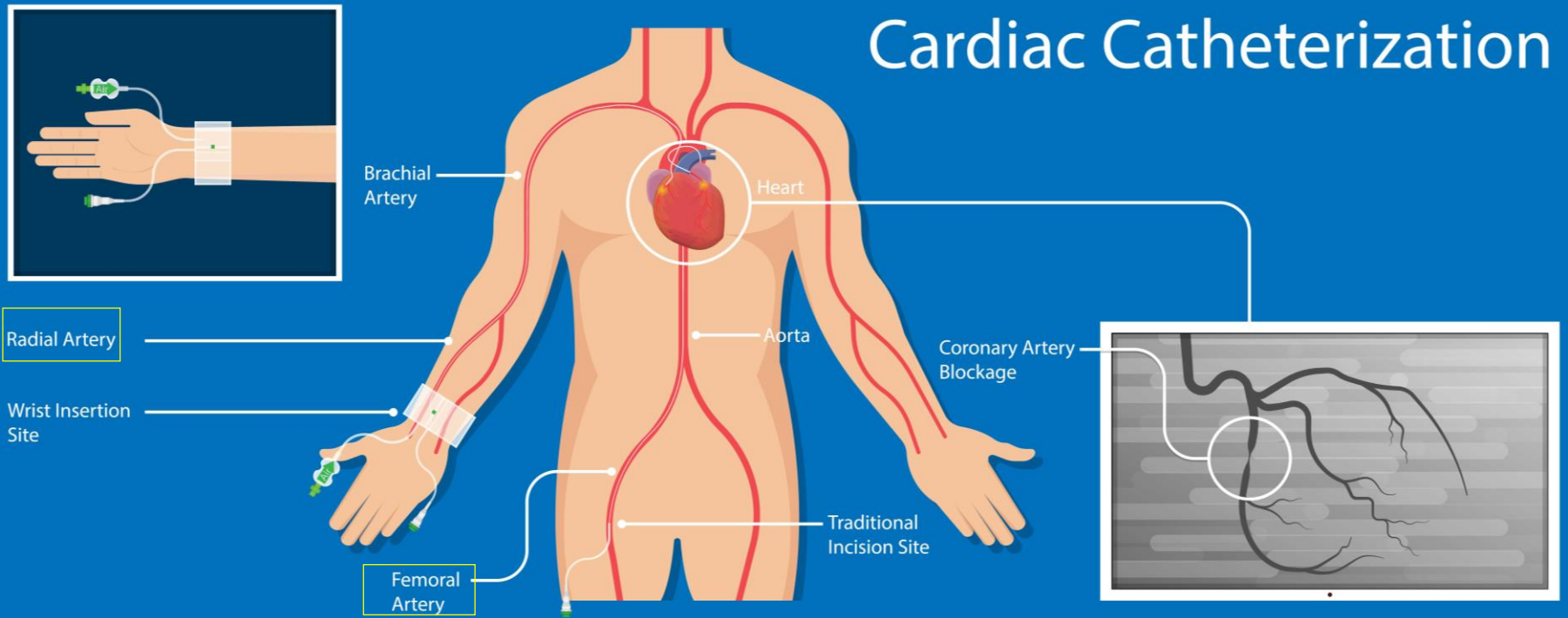




Dual Anti-Platelet Therapy (DAPT)

- Platelets are small particles in the blood that can clump together to **form blood clots in narrowed or blocked blood vessels**, leading to heart attack.
- Anti-platelet agents are a class of drug that “thin the blood” by preventing platelets from clumping together.
- **Almost all** heart attack / IHD patients, with or without heart procedures / surgery, are treated with two types of anti-platelet agents – this is called dual anti-platelet therapy (DAPT).
- One anti-platelet agent is **aspirin** and the second type of anti-platelet agent is P2Y12 inhibitor – **clopidogrel, prasugrel or ticagrelor.**

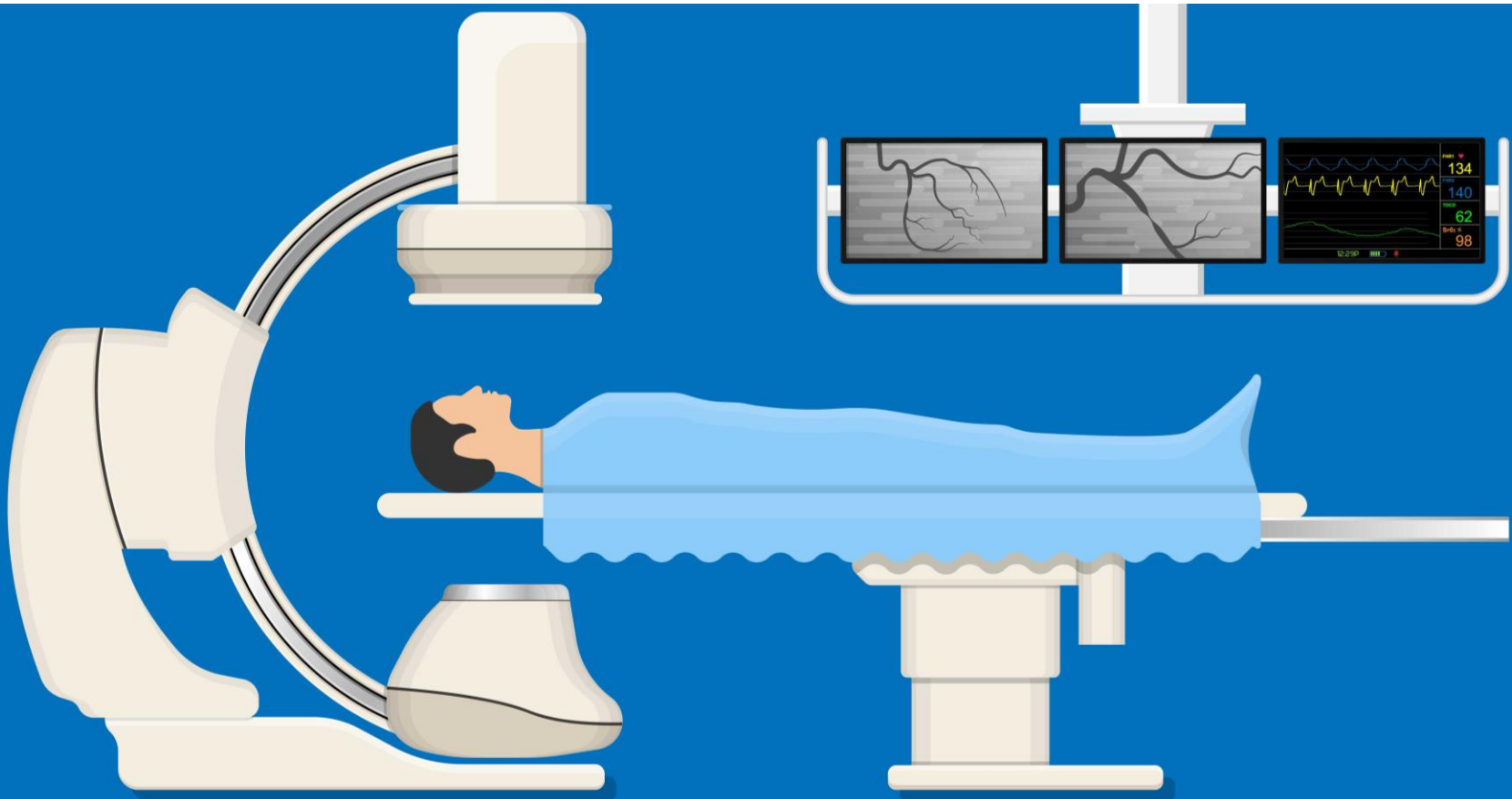
Coronary Angiogram And Angioplasty



A sheath is inserted through wrist (radial artery) or groin (femoral artery).

Through this sheath, the catheter is advanced into the heart.

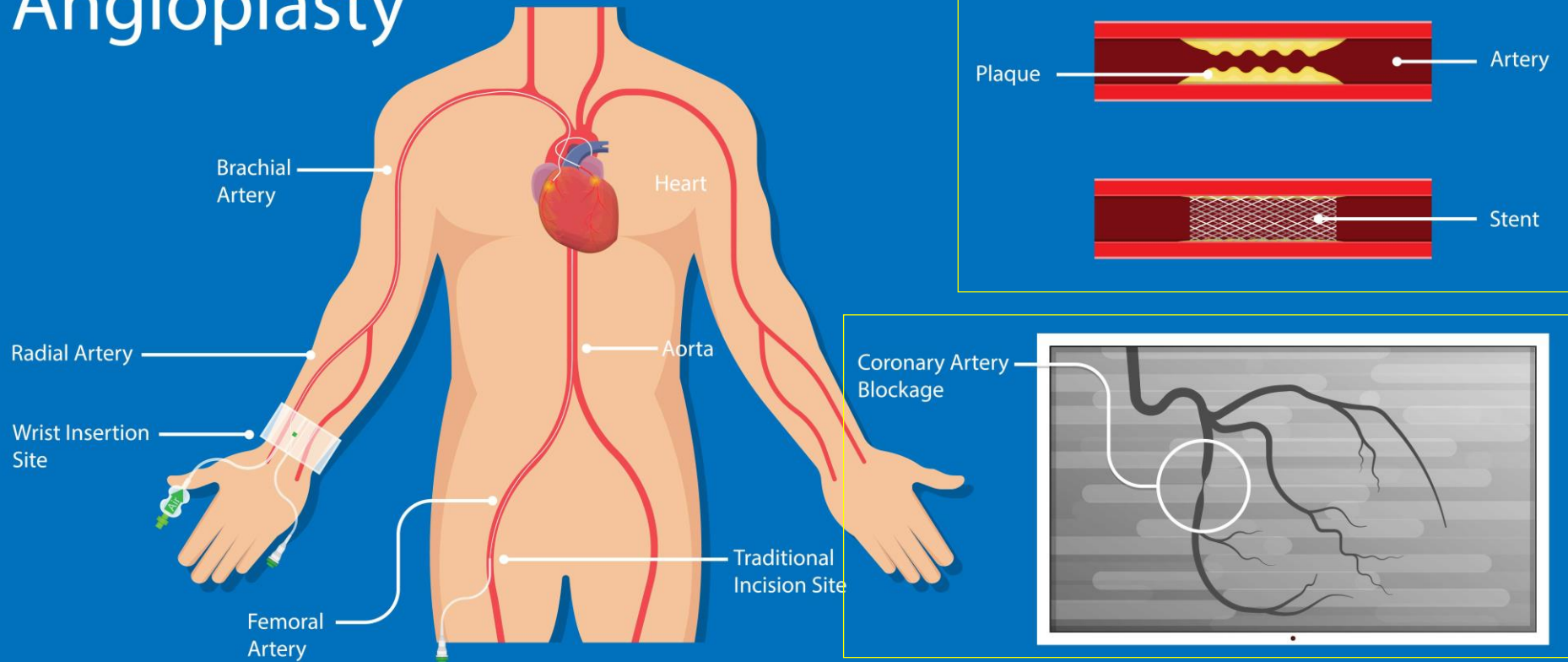
Coronary Angiogram And Angioplasty



A coronary angiogram is done first to check all the coronary arteries for narrowing or blockages.

Coronary Angiogram And Angioplasty

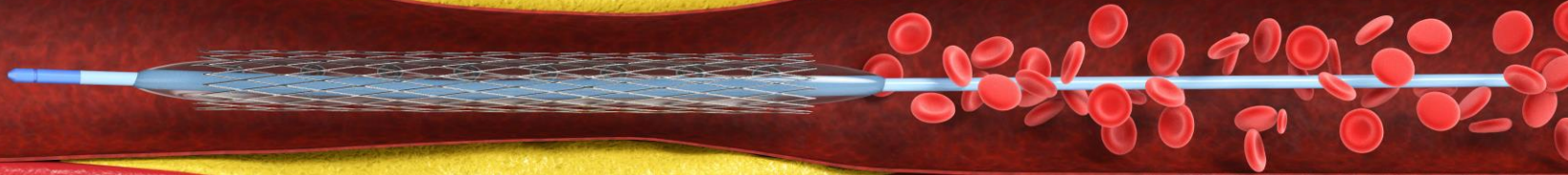
Angioplasty



Coronary angioplasty may be performed to restore blood circulation in your heart.

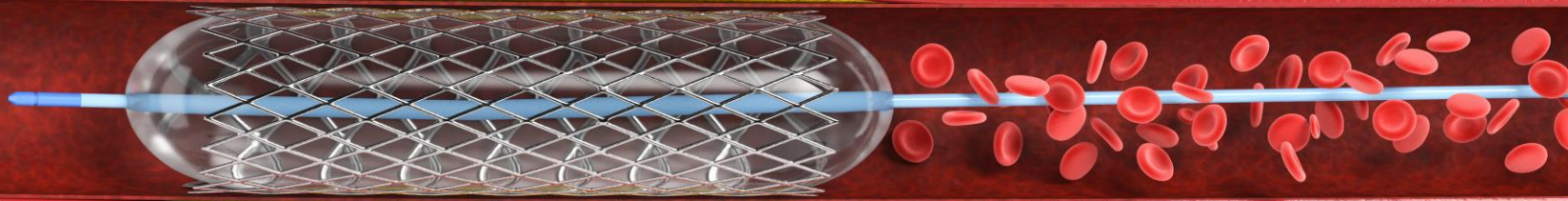
This is commonly called “ballooning and stenting”.

1



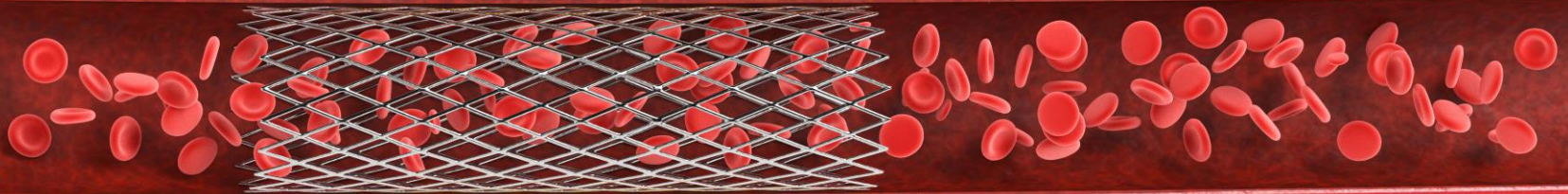
The balloon catheter is moved to the area of narrowing

2



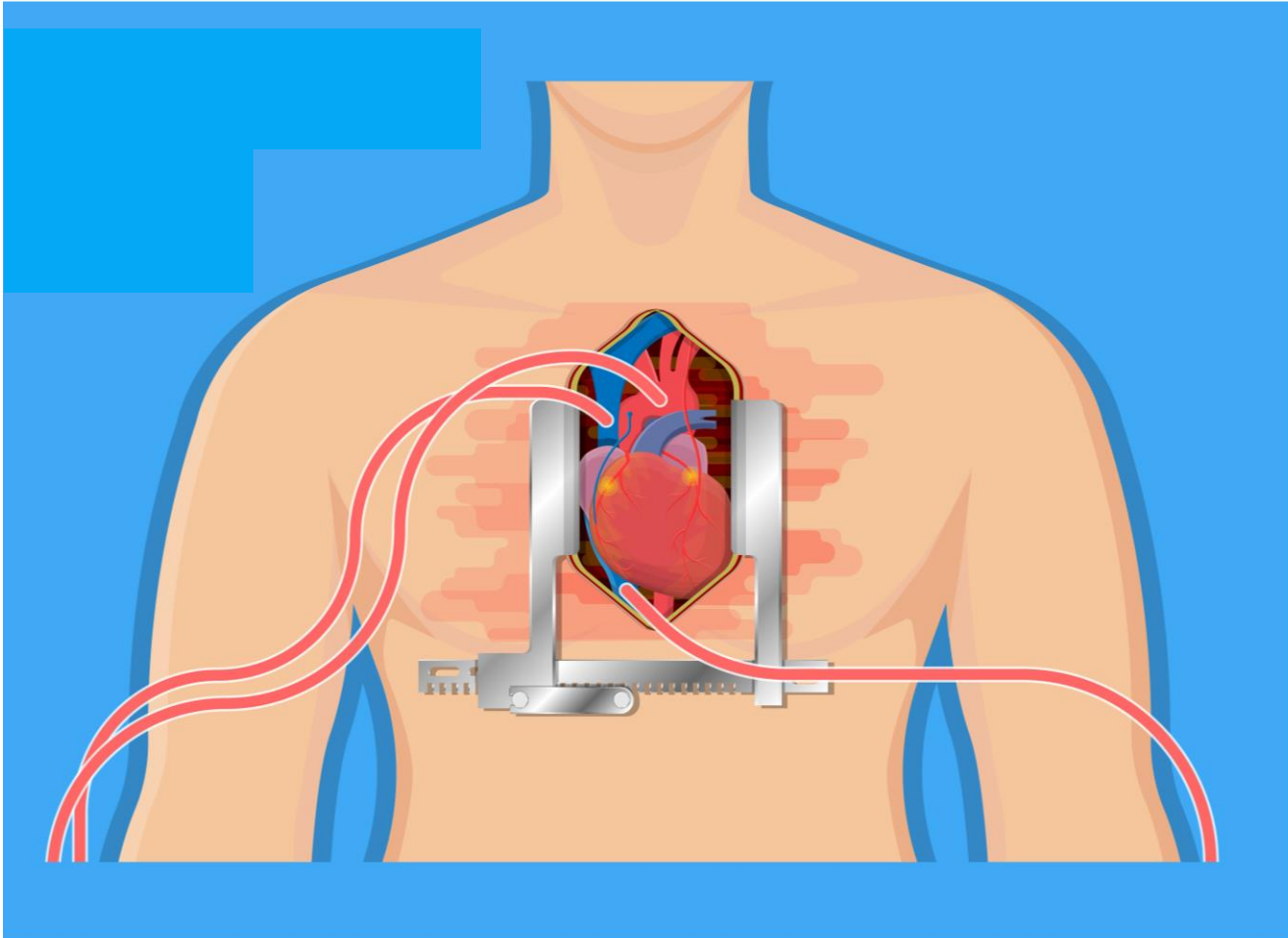
The balloon expands and presses the stent against the inner lining of artery

3



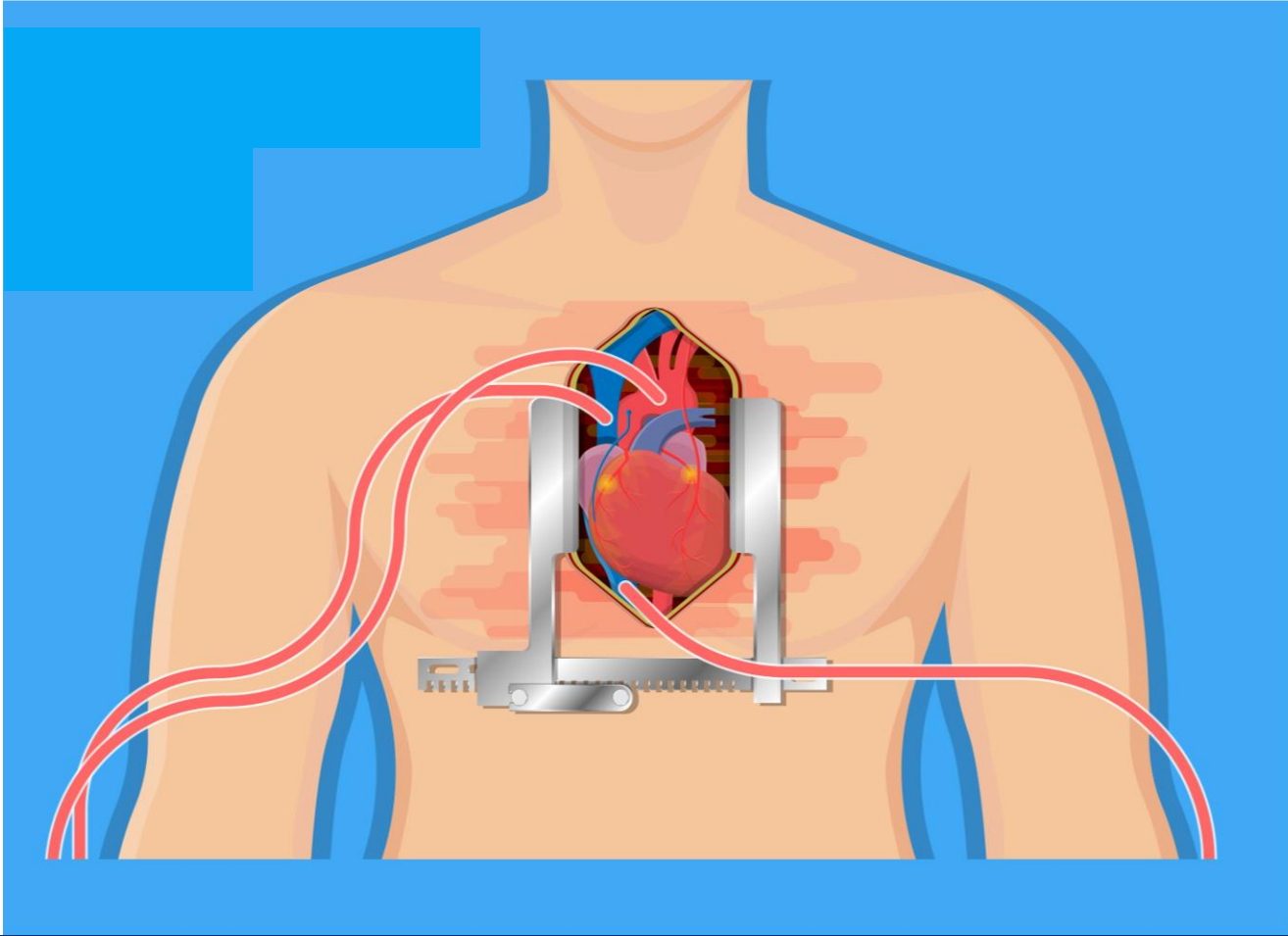
When the catheter is withdrawn, the stent remains within the artery.

Coronary Artery Bypass Graft (CABG) Surgery



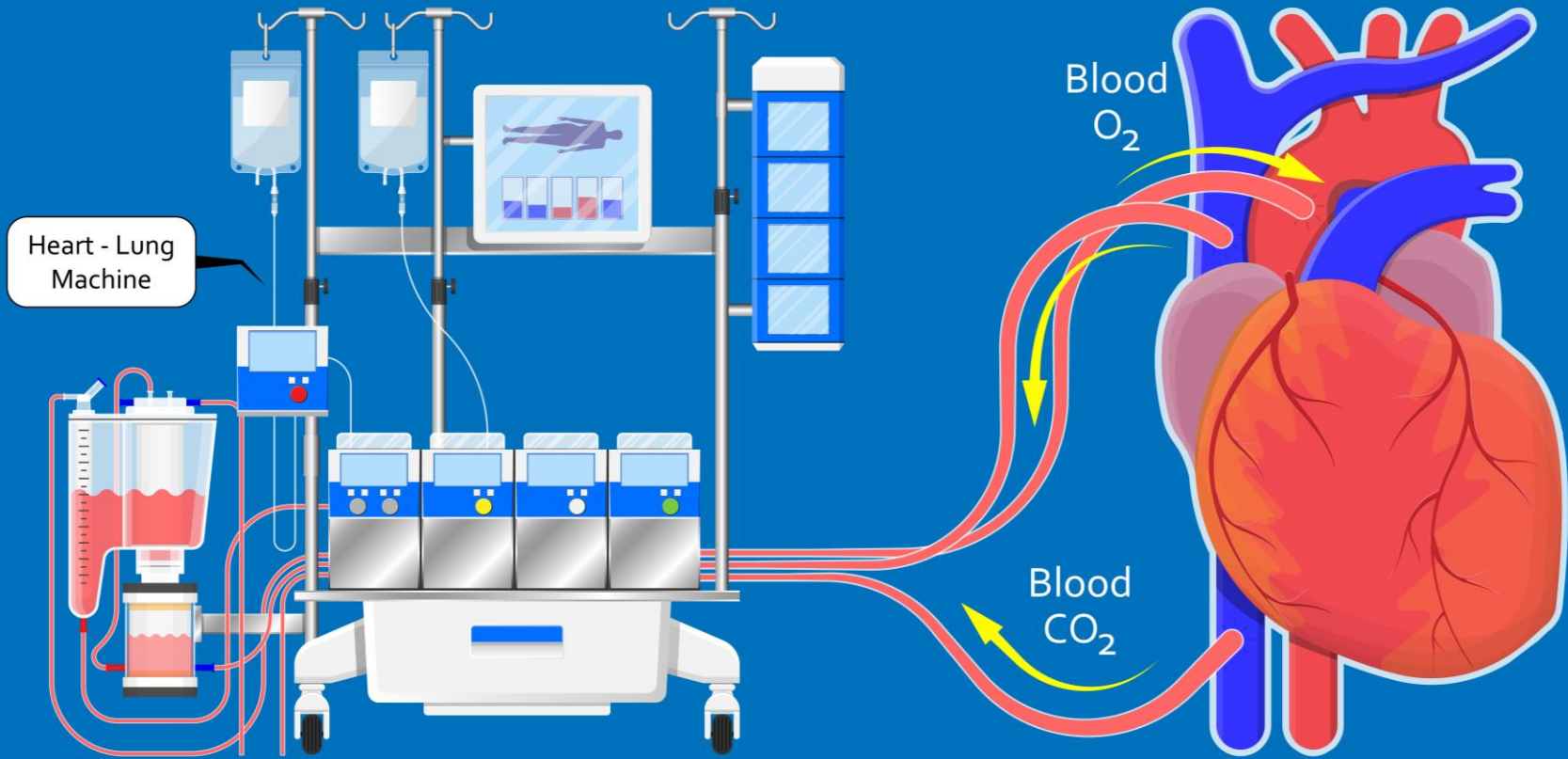
CABG is an operation to improve the flow of blood to the heart muscle in people with coronary heart disease, whose coronary arteries are severely narrowed or blocked.

Coronary Artery Bypass Graft (CABG) Surgery



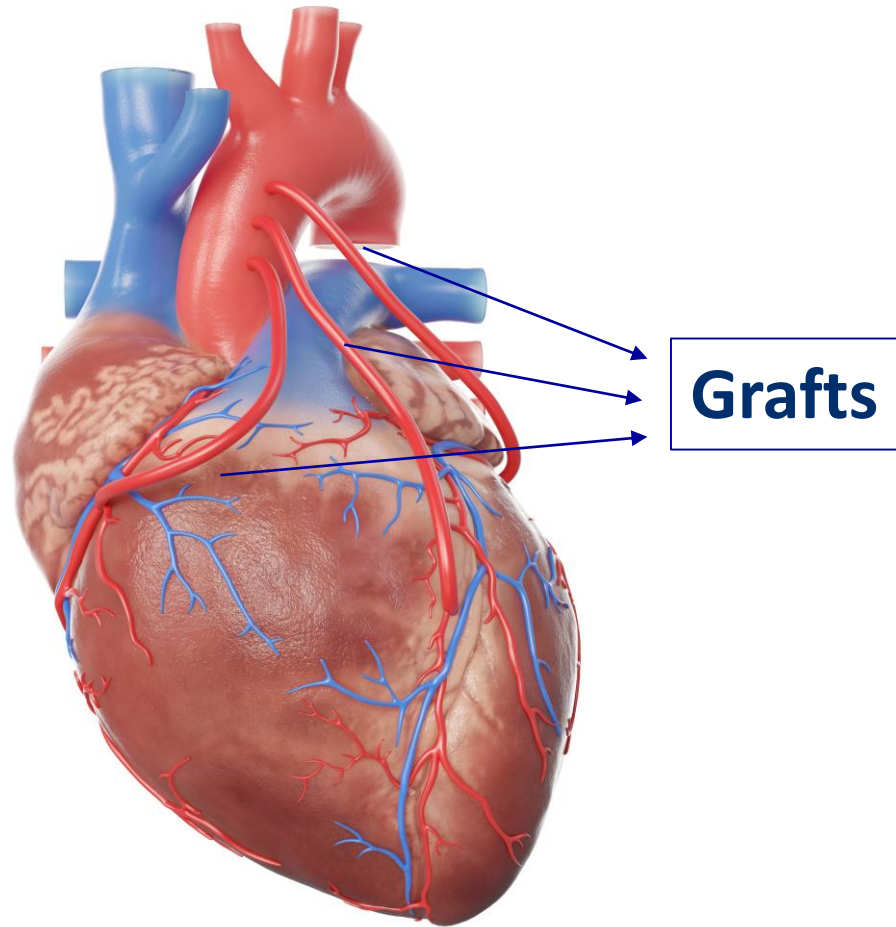
The operation involves taking blood vessels from other parts of the body and attaching them to the coronary arteries beyond the blockage.

Coronary Artery Bypass Graft (CABG) Surgery



During CABG, the heart is stopped and blood is pumped through an oxygenator or "heart-lung" machine.

Coronary Artery Bypass Graft (CABG) Surgery



Vein grafts are created to bypass the blocked coronary arteries. The blood is then able to flow around, or "bypass", the blockage.

Risk Factors for Heart Disease



Modifiable (Things you can change):

- Smoking
- Obesity
- Lack of physical activity
- High blood pressure
- High cholesterol
- Diabetes

Non-modifiable (Things you cannot change):

- Age
- Family history of heart disease
- Gender

Thank you.

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