

# Cardiovascular Diseases

**Cardiovascular diseases** is used to describe all the diseases of heart or blood vessels.

For example: Coronary heart diseases.

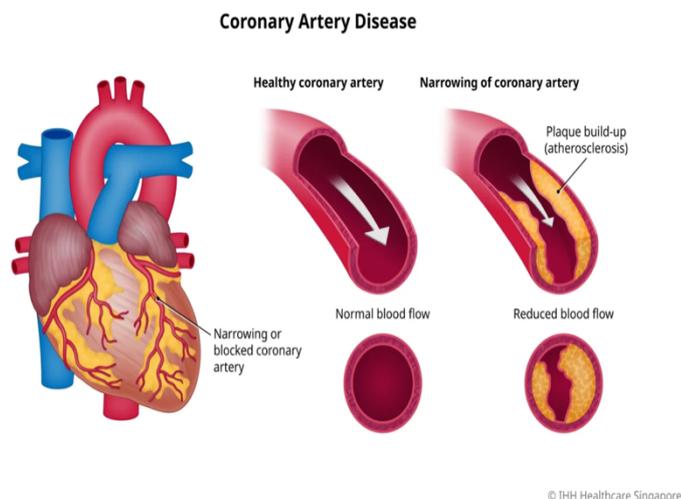
## Coronary Heart Disease ( CHD)

### 1- Definition:

- CHD is the disease when coronary arteries that supply the blood to muscle of heart get blocked by multiple layers of fatty acids.
- These layers of fatty acid (plaques) narrows the blood vessels, block the blood supply to the heart and p reduces the oxygen supply to the heart.
- This blockage can result in Heart attack.

### 2- Reasons behind CHD

- Poor Diet** : poor diet leads to obesity and increase Risk of This disease.
- Smoking**: one who smoke have higher risk of this disease
- stress**: Increased stress level more risk of CHD.
- exercise**: exercise can reduce the risk of cardiovascular disease, as it increases the blood supply to the heart and reduces cholesterol levels.
- Gender**: Males have higher risk than Females



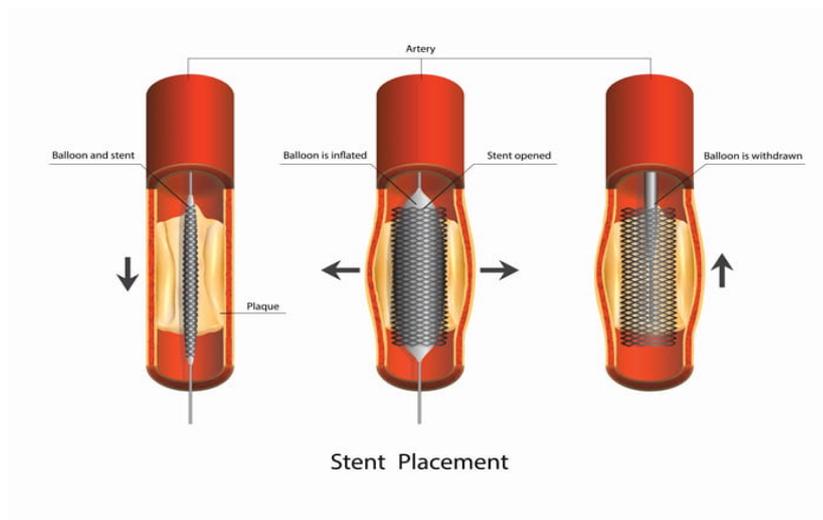
**3- Surgical Treatment of CHD**

There are some ways to treat CHD

- a) Stents
- b) Statins
- c) Replace with Artificial heart
- d) Replace with artificial valves
- e) Artificial blood in emergency

a) **Stents:**

- Stents are the tubes that are inserted inside the artery to keep them open
- Due to this treatment blood can pass through artery easily and get person alive



➤ **Advantages and Disadvantages of stent**

Stents	
Advantages	Disadvantages
Effective for a long period of time	Surgery may be required
Short recovery time	Risk of infection during surgery
Useful when drugs are not effective for a patient	Stent slightly increases the chance of getting a blood clot

**Fig 3. Advantages and Disadvantages of Stents.**

**b) Statins**

- Statins reduces the level of cholesterol in the blood
- Cholesterol:
  - I) It is a essential lipids that our body produces and need to function properly
  - II) too much cholesterol causing heart problems. This cholesterol is known as Bad or LDL cholesterol.
  - III) LDL cholesterol causes fatty deposit inside the arteries which leads to Coronary heart Disease
- Statins are the drugs which help to reduce the cholesterol level in the bloodstream and slows down the deposition of fats.
- **Advantages and Disadvantages of statin**

Advantages of Statins	Disadvantages of Statins
Statins reduce the levels of 'bad' (LDL) cholesterol in the blood, reducing the likelihood of plaques building up which lowers the risk of CHD, heart attacks and strokes. Statins can also increase levels of 'good' (HDL) cholesterol in the blood which can remove 'bad' cholesterol circulating around the body.	Statins must be taken regularly and long-term; if someone forgets to take them or doesn't take them regularly then they are less effective. They also take a while to start having an effect. In some people, undesirable side effects such as muscle and joint pain, kidney problems and neurological issues have been reported.

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### c) Replace with artificial heart

- There are also other treatments for heart failure that is heart transplants heart. Heart may be **Donor heart** or **artificial designed heart**

### Donor Transplants

- **Donor hearts** can be used to be transplanted into those with heart failure. People often donate their heart after death, and we can transplant these into a person in an operation. However, suitable hearts are few and far between.
- **Advantages and Disadvantages of donor heart**

Donor Hearts	
Advantages	Disadvantages
May be the only solution to heart failure	There is a shortage of donor hearts
Less risky and more natural than artificial hearts	Risk of immune rejection by the recipient immune system

Fig 7. Advantages and Disadvantages of Donor Hearts.



## Artificial Transplant

- It is a **man made device** that temporarily **pumps blood** in the patient. This can give the heart time to rest or heal, or help the patient as they wait for a transplant.
- Before starting the surgery, patient must have to take **Immunosuppressants** that **suppress** the immune system and reducing the risk of an immune response against the transplanted heart.
- if artificial heart didn't work properly, blood does not **flow smoothly** resulting blood clots which leads to stroke
- Patient take drugs regularly to keep blood thin and flow smoothly
- **Advantages and Disadvantages of artificial Transplant**

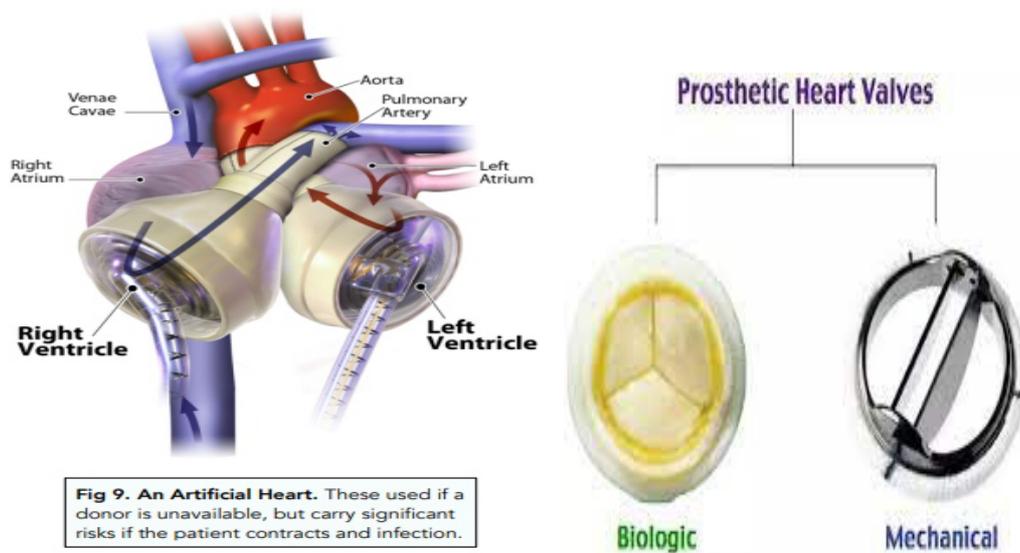
Artificial Hearts	
Advantages	Disadvantages
They are man-made, so are less likely to be immunologically rejected	Require invasive surgery, so carry risks such as thrombosis and other complications

Fig 8. Advantages and Disadvantages of Artificial Hearts.



d) **Replacement of faulty valves**

- valves of the heart can be damaged due to heart attack , infection or old age
- **Valves can become leaky and stiff.** Infection, heart conditions and age can cause damage to the valves of the heart. This can make them more leaky, which can cause the back flow of blood. It can also make them more stiff, stopping the valves from opening properly.
- **Valves can be replaced.** When the valves are severely damaged, valves must be replaced. There are two types of replacement valves:
  - **Biological valves** are made from humans or other animals such as cows or pigs.
  - **Mechanical valves** on the other hand are man made. Surgery is required for valve replacement and carries risks of thrombosis or complication.

e) **Artificial blood can keep alive in Emergency**

- When someone get injected in accident or some serious injury, a lot of blood loss occur then in emergency Artificial blood arrange to maintain the level of blood
- Artificial blood is a blood substitute which is used to replace the lost voulme of blood
- It is safe if there is no air bubble into the blood and keep patient alive even if they lose 2/3 of their red blood cells



## What Are the Benefits of Artificial Blood?



Reduces dependency on blood donors



Eliminates the risk of contamination



Universally matched to all blood types



Longer shelf-life than natural blood



Quick and effective response to mass trauma events



Accessible to patients in rural areas



Attainable blood bank for countries who can not maintain a natural blood bank

**medix**  
It's a matter of life