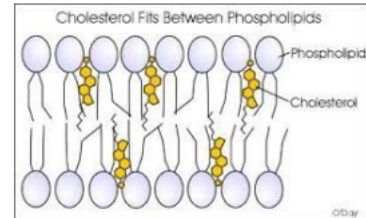


Cholesterol

Function of cholesterol

1. Make sex hormones (testosterone & oestrogen/progesterone)
2. Type of lipid in cell membrane



Production of Cholesterol

All cells produce cholesterol but 25% of all production takes place in the liver.

Lipoproteins

Proteins in blood that transport cholesterol to/from liver.

1. HDL

Transports excess cholesterol from the body cells → liver for elimination.

This prevents accumulation of cholesterol in the blood.

2. LDL

Transports cholesterol from liver → body cells.

Most cells have LDL receptors that take LDL into the cell where it **releases cholesterol**.

Negative Feedback

1. Once a cell has sufficient cholesterol, it inhibits the synthesis of new LDL receptors
2. LDL cannot enter cell & stays in the blood
3. It may deposit **cholesterol** under the **endothelial** lining of **arteries** forming **atheromas**

High Blood Cholesterol

A diet high in **saturated fats/ cholesterol**, increases risk of **atherosclerosis**

Treatment

1. Regular physical activity

Increases HDL: LDL ratio Or HDL levels
This **lowers** blood cholesterol thereby reducing atherosclerosis

2. Dietary changes

Reduce the levels of total fat in the diet and to replace saturated with unsaturated fats

3. Statin drugs

Reduce blood cholesterol by inhibiting the synthesis of cholesterol by liver cells

Familial Hypercholesterolemia (FH)

Familial Hypercholesterolemia

Inherited **dominant allele** that increases an individual's chance of having **high blood cholesterol**

Cause of high cholesterol

1. **Reduction** in the number of **LDL receptors**
2. **Altered structure** of LDL receptor

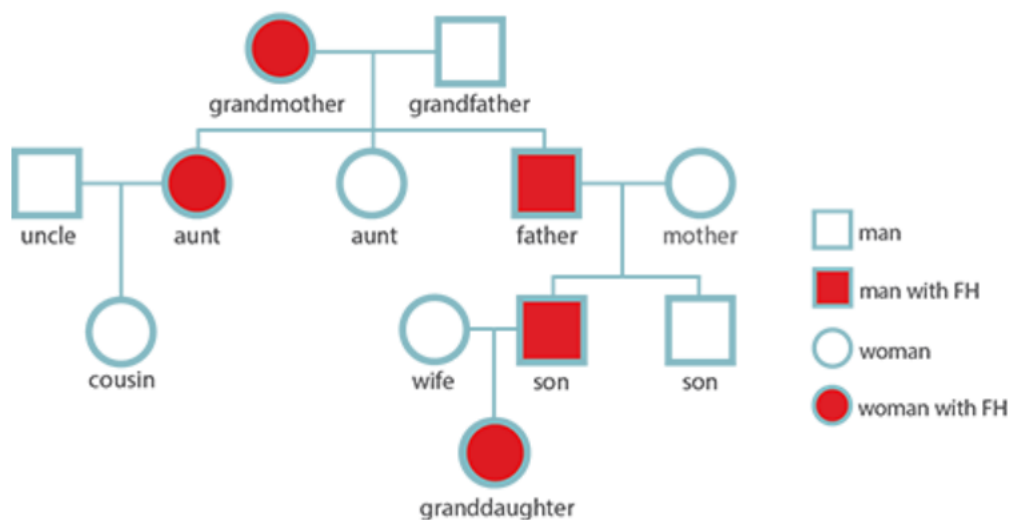
Diagnosis

Genetic testing can be done to determine if the dominant FH gene has been inherited.

Treatment

1. Lifestyle modification (reduced fat intake & regular physical activity)
2. Statin drugs (prevent cholesterol production)

Family screening is critical.



Cardio vascular Disease (CVD)

Any disease affecting the heart, blood vessels or blood pressure.

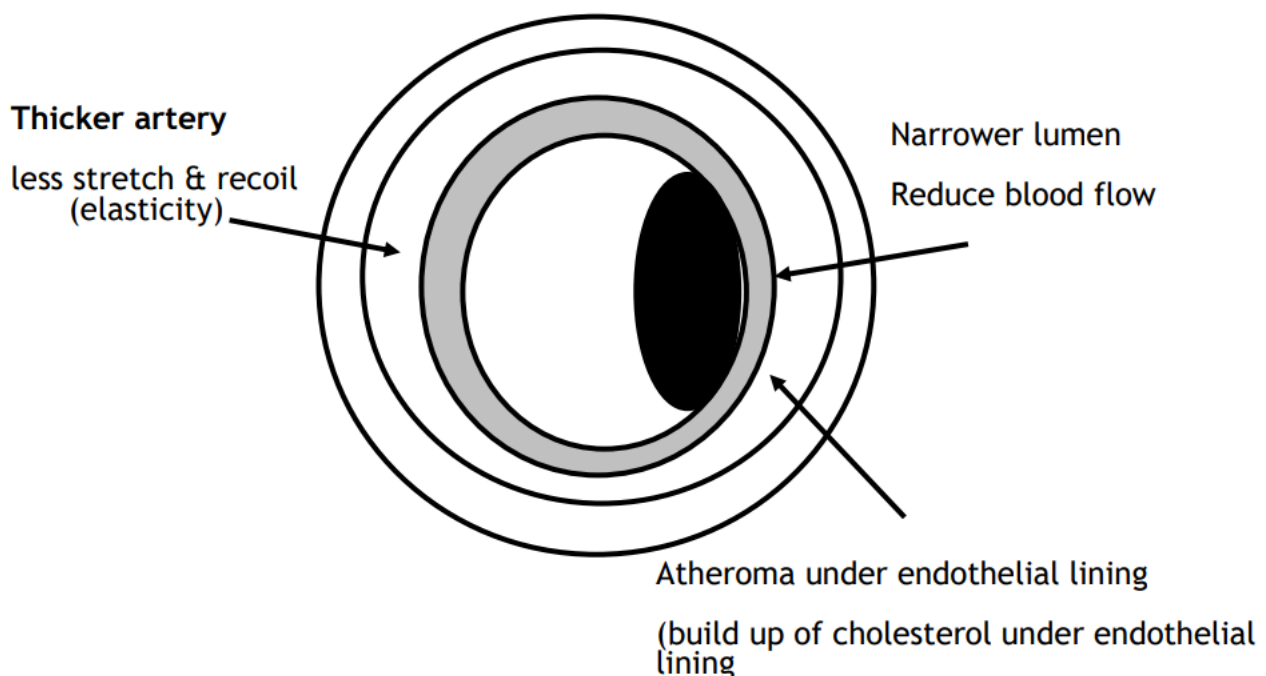
Examples

1. Angina
2. Heart attack
3. Stroke
4. PVD

Cause: atherosclerosis.

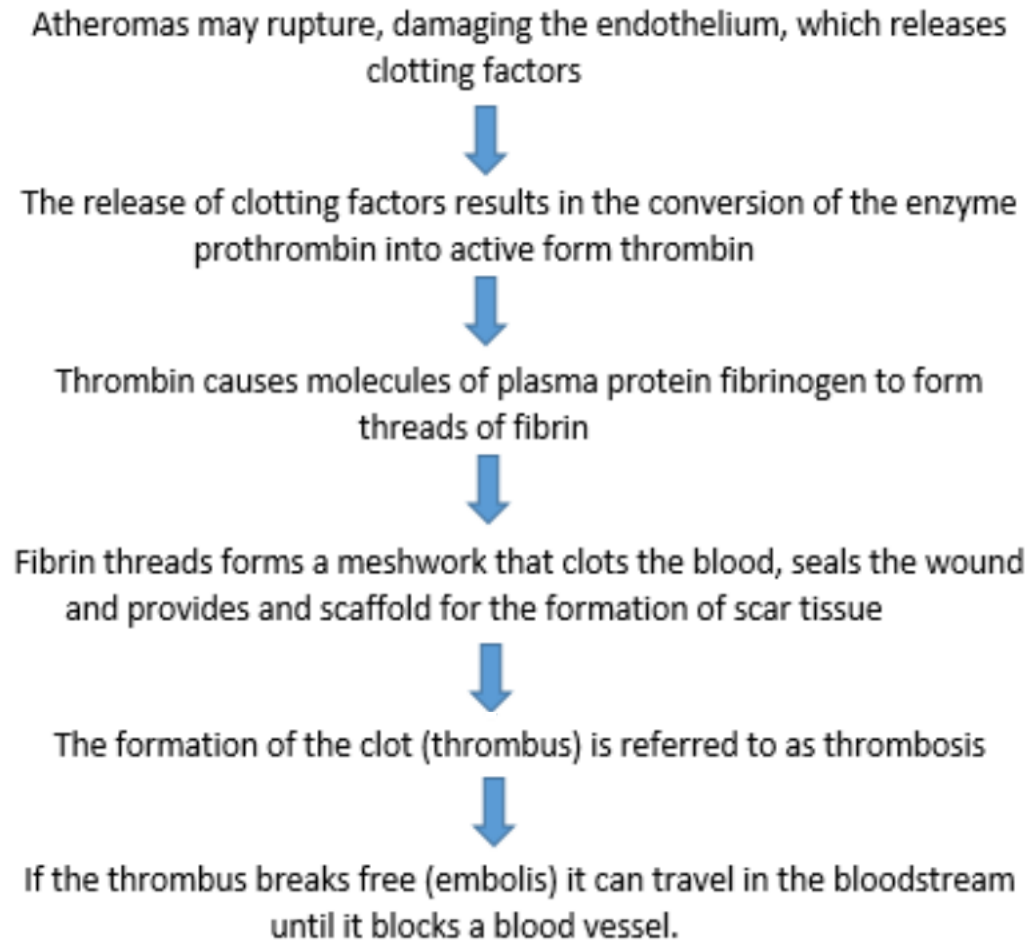
Atherosclerosis

1. Atheroma forms
Accumulation of fatty material (cholesterol, fibrous material and calcium) beneath the **endothelium** of the artery
2. Atheroma grows
Thickening of the artery & narrowing lumen diameter
 - ♦ Thicke walls = loss of elasticity (no stretch/recoil)
 - ♦ Narrower lumen = Reduced blood flow
3. High blood pressure due to loss of elasticity/narrower lumen.



Thrombosis

The steps involved in the formation of a thrombus (clot) are:



Consequences of thrombosis

1. **Myocardial Infarction/heart attack**

Blockage of coronary artery by thrombus/clot

Lack of oxygen delivered to heart cells causing death of heart tissue

2. **Stroke**

Blockage by arteries in the brain caused by a thrombus/embolus

Lack of oxygen delivered to brain cells causing death of heart tissue

Peripheral Vascular Disease

PVD

Narrowing of the arteries due to **atherosclerosis**.

Most common in the **leg arteries** but anywhere apart from brain/heart.

Pain is experienced in the (leg) **muscles** due to a **limited supply of oxygen**.

DVT

A blood clot/thrombus that forms in a deep vein, most commonly in the leg.

Pulmonary embolism

Thrombus in deep vein of leg breaks off and result in a pulmonary embolism in the lungs.