

CORONARY ARTERY DISEASE

This information sheet is for your information and is not a substitute for medical advice. You should contact your doctor or other healthcare provider with any questions about your health, treatment or care.

What is coronary heart disease?

Coronary artery disease occurs when the arteries that supply blood and oxygen to the heart muscle become damaged or diseased. The most common cause is cholesterol and calcium build-up in these arteries.

What are the risk factors for coronary artery disease?

- **Age:** As age increases, so does the risk of damage to coronary arteries.
- **Gender:** Men are at higher risk of coronary artery disease; but in women the risk increases following menopause.
- **Family history:** Family history of heart disease is related to a higher risk of coronary artery disease.
- **Smoking:** Those who smoke or experience second-hand smoking have a greater risk of coronary artery disease.
- **High blood pressure:** Blood pressure that is uncontrolled can result in hardening and thickening of the arteries, thereby narrowing the area for blood to flow.
- **High blood cholesterol levels:** High levels of bad cholesterol (LDL) in the blood can increase the risk of plaque formation.
- **Diabetes mellitus** is linked to increased risk of coronary artery disease.
- **Overweight and obesity:** Excess weight usually worsens other risk factors.
- **Sedentary lifestyle:** Lack of exercise increases the risk of coronary artery disease.
- **Unhealthy diet:** Consuming food high in saturated fats, trans fat, salt and sugar could increase the risk of coronary artery disease.
- **Stress:** High stress levels may contribute to the damage caused by coronary artery disease.
- **Sleep apnoea:** This condition results in repeatedly stopping and starting breathing while sleeping, causing sudden drops in oxygen levels. These sudden drops in oxygen levels increase blood pressure and places strain on the cardiovascular system, which could possibly lead to coronary artery disease.
- **Alcohol:** Use of alcohol can worsen the other risk factors of coronary artery disease.

What are the symptoms of coronary artery disease?

- Pressure or pain in the centre of the chest, which travels to the left arm (angina)
- Pain located in the right side of the chest, down both arms, in the jaw or in the back
- Shortness of breath
- Heart attack as a result of a completely blocked coronary artery

What are the causes of coronary artery disease?

Coronary artery disease is thought to start with damage to the inner layer of a coronary artery. This damage may result from various factors, such as:

- smoking
- high blood pressure
- high cholesterol
- diabetes mellitus
- a sedentary lifestyle.

What are the complications of coronary artery disease?

- **Stable angina (chest pain)** – predictable but irregular chest pain or discomfort that usually occurs with activity or stress, but is resolved with rest or medication
- **Unstable angina (chest pain)** – your heart doesn't get enough blood flow and oxygen; chest pain experienced suddenly and for the first time; occurs seemingly without cause (you may even be resting or asleep) and worsens over time
- **Heart attack (myocardial infarction)**
- **Heart failure** – when areas of the heart do not get enough oxygen supply or the heart has been damaged due to a heart attack, it may be too weak to pump enough blood to meet the body's needs

- *Abnormal heart rhythms* – insufficient blood supply to the heart or damage to the heart can interfere with the heart's electrical impulses, resulting in abnormal heart rhythms
- *Death* – in severe cases

How is coronary artery disease diagnosed?

- *Electrocardiography (ECG)*: This is a quick and easy test that is performed to provide an electrical tracing of the heart for the cardiologist to assess.
- *Echocardiogram*: This test uses sound waves to produce images of your heart to help assess if all parts of the heart wall are contributing to your heart's pumping activity.
- *Coronary calcium scoring*: A CT scan is performed to assess the build-up of calcium in the coronary arteries. The higher the calcium score, the higher the risk of the artery being blocked. It does not confirm blockage of the coronary arteries, but the presence of coronary calcium plaque.
- *Stress ECG*: This can be performed by monitoring the heart while exercise is performed on a treadmill or medication is administered intravenously. The heart is monitored either via an ECG or imaging of the heart to assess blood flow.
- *Coronary CT angiography*: Dye is administered intravenously and a CT scan is performed to visualise the inside of the coronary arteries.
- *Coronary angiogram*: This is an invasive procedure where a catheter (small tube) is placed into the artery of the groin or wrist and fed into the coronary arteries. Dye is then introduced into the coronary arteries and an X-ray camera is used to see inside the arteries and identify the presence of a blockage. With this procedure possible blockages can be fixed with the introduction of a stent or angioplasty.

What is the treatment for coronary artery disease?

The aim of treatment for patients with coronary heart disease is to reverse or slow the progress of the disease and ultimately prolong life. Treatment will alleviate symptoms and improve quality of life. Treatment options available to patients are medical treatment or interventional treatment.

Medical treatment

Medication can be given to patients to help prevent plaque from worsening and to relieve symptoms. A large number of patients with coronary artery disease are well-controlled with medication. It is important that patients take their medication carefully and responsibly, as prescribed by their doctor. A coronary artery angiogram is performed to decide which patient is a candidate for interventional treatment. Interventional treatment may be recommended over medical therapy for patients with stable angina.

Interventional treatment

Interventional treatment for coronary heart disease aims to open the blockage in the coronary artery and restore blood flow to the heart. Interventional treatment includes minimally invasive percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement. A patient may need coronary artery bypass graft (CABG) surgery, which is major surgery.

Medical versus interventional treatment

Several factors may help determine whether medical or interventional treatment is a better treatment option.

- **Age**
Interventional treatment is associated with more risks in older patients. Although interventional treatment is associated with higher risks, patients are assessed individually and an appropriate course of treatment is decided upon.
- **Severity of angina**
Angina patients are usually managed with medical treatment initially, unless a stress ECG or chemical testing indicates that the person may have a severe condition. If medical treatment does not significantly improve the symptoms of angina or if the person cannot tolerate medical treatment, interventional treatment may be recommended.
- **Advanced heart disease**
Heart disease may lead to poor pumping function of the left ventricle (the heart chamber that pumps blood around the body) and it may even lead to a serious condition called congestive heart failure. People with these advanced types of heart disease may benefit more from interventional treatment than from medical treatment.

- **Test results**
Certain tests can provide an accurate measure of the degree of coronary heart disease. These tests may establish if medical or interventional treatment is more appropriate and can help decide which interventional option (angioplasty or bypass surgery) is best.
- **Narrowing of coronary arteries**
Interventional treatment is usually more beneficial than medical treatment in the following circumstances:
 - the coronary arteries are severely narrowed
 - many coronary arteries are narrowed
 - the left, main coronary artery (that supplies blood to the left side of the heart) is narrowed to the extent that it becomes risky.
- **Peripheral arterial disease**
Peripheral arterial disease refers to the narrowing of arteries in parts of the body other than the heart. For example, arteries that supply blood to the arms and legs may be narrowed. Studies suggest that peripheral vascular disease patients are at greater risk from angioplasty and bypass surgery and medical treatment may therefore be a better choice.

Angioplasty and stenting

Angioplasty involves passing a tiny, deflated balloon through the arterial system via the wrist or groin to the narrowed coronary artery. The balloon is then inflated, causing the walls of the balloon to dilate (expand) the narrowed artery, which restores blood flow to the heart muscle.

A stent (an expandable tube usually made of wire mesh) is often placed into the narrowed artery after the vessel has been expanded with the balloon. This is done to prevent the narrowing from recurring.

Coronary artery bypass graft (CABG) surgery

CABG surgery involves sewing one end of an artery or vein above a blocked coronary artery and the other end below the blockage, thereby allowing blood an alternate pathway to the heart. The arteries or veins used for the bypass are called grafts and are usually obtained from the leg or the chest wall. Bypass surgery may not be possible if the coronary artery is heavily calcified or if the heart disease is very widespread.

Hospital admission and intensive care unit treatment is usually necessary for this procedure. **Please discuss these aspects with your treating doctor.**

What lifestyle changes can be made to prevent or slow down the progression of coronary artery disease?

- Quit smoking.
- Control conditions such as high blood pressure, high cholesterol and diabetes mellitus.
- Stay physically active.
- Maintain a low-fat, low-salt diet that is rich in fruit, vegetables and whole grain.
- Maintain a healthy weight.
- Reduce and manage high stress levels.
- Take medication as prescribed'
- Keep doctor's appointments.

Please keep this information handy when you visit your doctor or contact your scheme's chronic disease management programme:

- A symptom and treatment log
- Any emergency room visits or hospital admissions
- Frequency of chest pain per week
- Frequency of chest pain per week, not controlled with medication
- How many days per week do you take your medication?

References

1. HEALIO. Website. <https://www.healio.com/>.
2. MAYO CLINIC. Website. <https://www.mayoclinic.org/>.

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