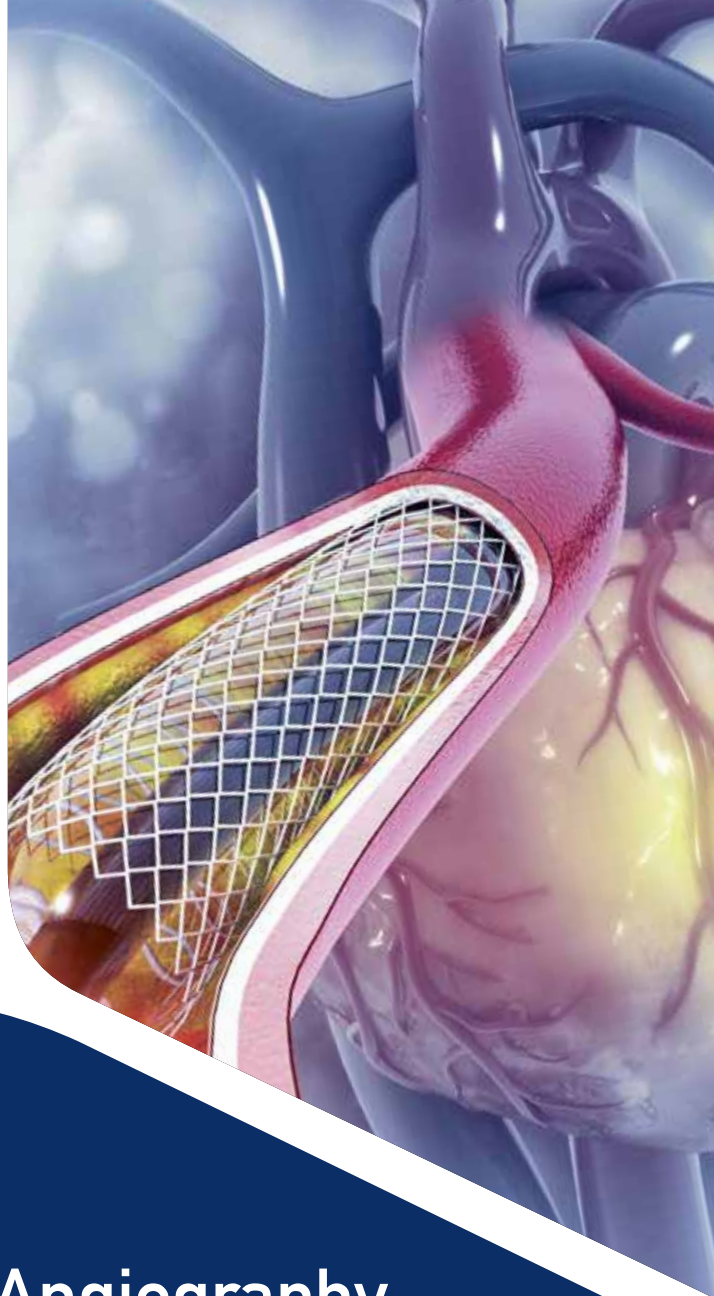




National University
Heart Centre
Singapore



Coronary Angiography and Percutaneous Coronary Intervention (PCI)

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This brochure provides essential information about the disease and its associated symptoms. It also explains current treatment options. We have also included a glossary of medical terms at the end of the brochure.

Information in this brochure is given as a guide only and does not replace medical advice from your doctor. Please seek the advice of your doctor if you have any questions related to the procedure, your health or medical condition.



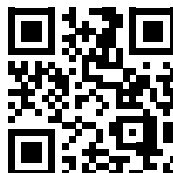
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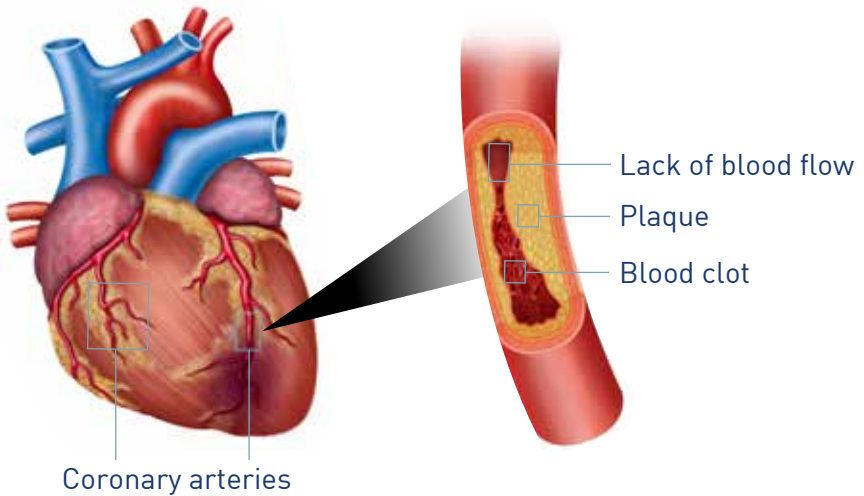
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Coronary Artery Disease (CAD)

Coronary Artery Disease (CAD) develops when the arteries that supply blood to the heart become narrowed or blocked due to a build-up of fatty deposits known as plaque, making it more difficult for the arteries to supply blood to the heart.



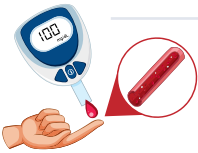
Symptoms of CAD may include:

- ♥ Chest pain (angina)
- ♥ Shortness of breath
- ♥ Heaviness in the chest
- ♥ Pain in the jaw or down the arms
- ♥ Heartburn
- ♥ Nausea
- ♥ Vomiting
- ♥ Heavy sweating

Who is at risk of CAD?

Majority of risk factors can be controlled. Successfully addressing these factors can reduce the risk of further heart disease:

High blood pressure places a strain on the heart and directly damages blood vessels, making it easier for plaque to form.



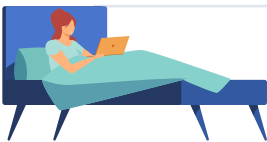
Diabetes Mellitus significantly increases the risk of CAD, heart attack, stroke, kidney failure, and more.

High cholesterol in the blood can lead to atherosclerosis, with the build-up of thick, fatty calcified plaque that clogs arteries.



Smoking results in inflammation of the heart arteries & increases the risk of developing clots.

Obesity or excess body fat, particularly around the waist, can be a cause of increased blood pressure and high blood cholesterol. It also directly results in inflammation & promotes atherosclerosis.



Lack of physical activity or an inactive lifestyle may contribute to CAD.

Certain risk factors are beyond your control, including:

- ♥ Age (males above 45 years old and females above 55 years old)
- ♥ Family history of heart disease
- ♥ Ethnicity
- ♥ Gender

Diagnosing Coronary Artery Disease (CAD)

If your doctor suspects that you have CAD, you'll likely be asked to take a physical exam to check your heart and further tests to clarify. Some of the tests used to diagnose CAD include:



Electrocardiogram (ECG)

Records your heart's electrical activity in order to identify an abnormal heartbeat or damage to the heart muscle.



Stress test

Evaluates your physical fitness & ECG changes which may suggest advanced CAD.



Echocardiogram

Checks your heart function - including your valves, major blood vessels and chamber measurement - using sound waves.

Coronary Angiography

Coronary angiography is a procedure to visualize the heart arteries. The coronary arteries are the blood vessels that supply blood to the heart muscles. On ordinary chest X-ray films, the heart appears as a silhouette, and the coronary arteries are not visible.

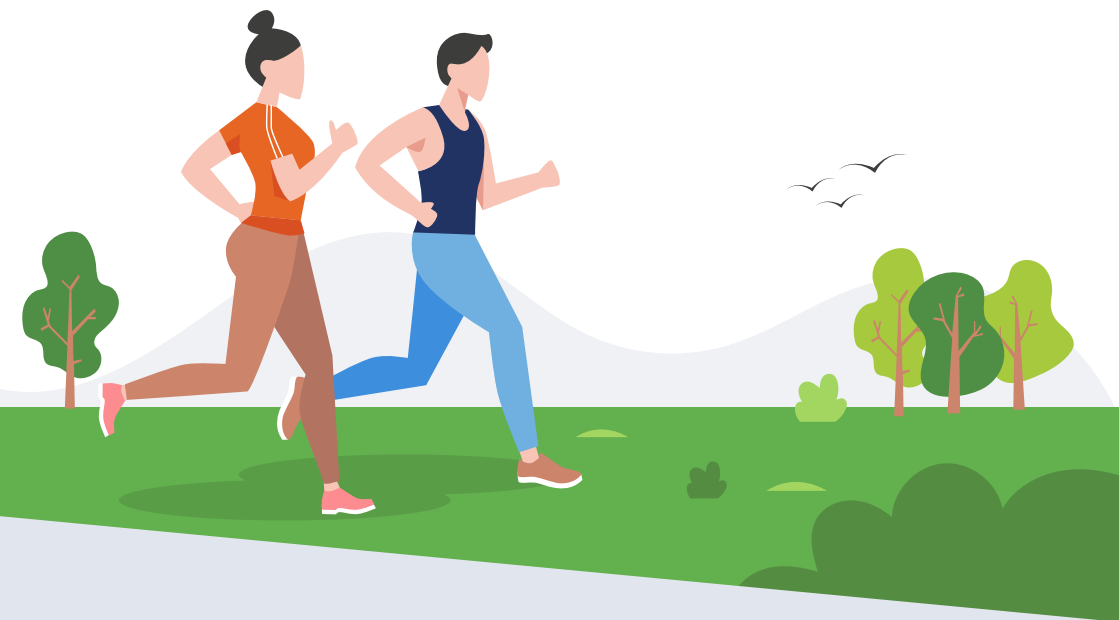
To see the coronary arteries, a special dye or contrast medium is injected through a small tube (catheter) inserted via an artery in the groin or the wrist. The catheter is then advanced to the heart and positioned at the openings of the coronary arteries before injection is performed.

After the catheter placement and filming, which normally takes about 15 to 30 minutes, the catheters will be removed. Upon removal, the doctor will discuss his/her findings with you. If necessary and you are agreeable, he/she may proceed directly to coronary angioplasty, a procedure for the treatment of CAD.



Coronary angiogram showing blocked artery (white arrow)

Treatment options for Coronary Artery Disease (CAD)



Treatment of CAD begins with **lifestyle changes** and/or **medications** that help the heart work more efficiently and improve blood flow to the heart muscle.

If these initial treatments cannot effectively control the symptoms of CAD, a Percutaneous Coronary Intervention (PCI) procedure may be required. The same applies if the artery narrowing is severe enough to deprive the heart muscle of oxygen due to reduced blood flow.

PCI procedures that are “minimally invasive” include balloon angioplasty and coronary artery stenting.

Depending on your medical history or the condition of your blocked artery, coronary artery bypass surgery may be advised by your doctor. This uses a healthy blood vessel taken from the chest, leg, or arm to redirect the flow of blood around a section of blocked artery within the heart.

Percutaneous Coronary Intervention (PCI) may include:

Balloon Angioplasty

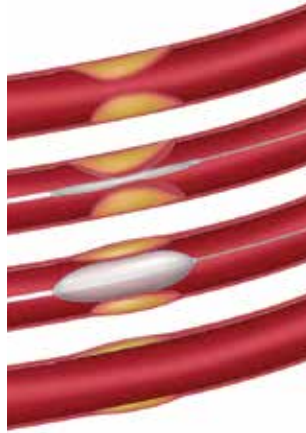
A small balloon is inflated within the narrowed portion of a blocked artery, pushing plaque against the artery walls and improving blood flow to the heart.

Artery with plaque

Catheter with uninflated balloon inserted

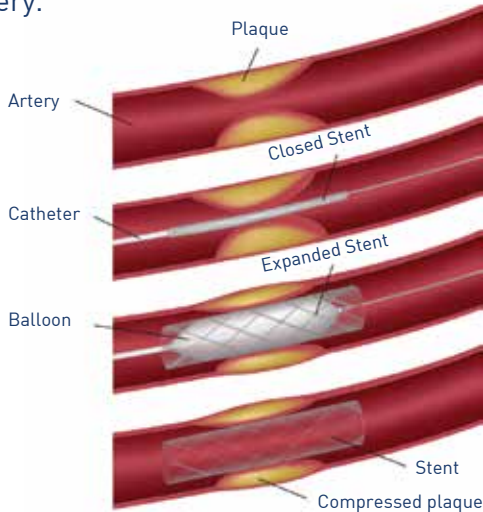
Balloon inflated, plaque compressed

Widened artery



Coronary Stenting

A metallic coronary artery stent is permanently implanted in the blocked artery.



Your Percutaneous Coronary Intervention (PCI) procedure

Understanding and deciding your treatment is important, so take time to learn about the procedure and ask your doctor questions.

Preparing for your procedure

In preparation for your procedure, your doctor will provide you with specific instructions such as fasting (no food or drink) on the day of the procedure. Your doctor will also ask you about:



- ♥ Medications you are currently taking.

- ♥ Medications you cannot take or may have an allergy to.

- ♥ Any history of bleeding problems.

- ♥ Any metal allergies.

- ♥ Any surgery or dental work you may be due to have soon.



If you are a female, your doctor may also want to know whether you are currently pregnant, nursing a child or planning to get pregnant.

Some routine investigations, including blood tests, an Electrocardiogram (ECG) and a chest X-ray may be done before the procedure. You will usually be required to fast 6-8 hours before the procedure.



On the day of your procedure

- ♥ On the morning of your test, you will be asked to empty your bladder and shave hair from your groin. You will be placed on a movable table, with X-ray cameras and LCD monitors around you. A nurse will clean your groin and wrist and then drape you with sterile towels.

After an injection of a local anesthetic, a plastic tube called a sheath is inserted in an artery in the groin or wrist. Through this sheath, another long and narrow tube (catheter) is advanced to the origin of the coronary artery. A coronary angiogram is done first to provide a “road map” for the Percutaneous Coronary Intervention (PCI), if necessary.



- ♥ In PCI, a fine wire is then threaded through the catheter and advanced into the coronary artery across the narrowed segment. This wire serves as a rail over which the balloon catheter is finally delivered and positioned over the area of narrowing for focused angioplasty to open the narrowed segment.



- ♥ The procedure is usually followed by another procedure called stenting where a small metal or polymer coil is placed to serve as scaffold. The procedure may take from 1/2 to 2 hours, depending on the complexity of the diseased artery.



- 1 Your doctor will use a special X-ray machine to see the scaffold or stent in your artery and to assess how well the artery has been opened up.
- 2 Once blood flow is restored, the balloon is removed.
- 3 The stent or scaffold is left behind, and may slowly release medication to treat the diseased area.

After your procedure

The sheath may be removed immediately after the procedure or kept in your artery for 4 to 6 hours as advised by the doctor/nurse. Upon removal of the sheath, the puncture site will be compressed for at least 30 minutes to ensure that there is no bleeding. You will have to remain in bed for several hours following a procedure to ensure sufficient healing of the puncture site before walking. Your cardiologist will determine how long you need to be in bed before you are allowed to walk. Some blood tests and ECGs may be performed to monitor your condition. If there are no complications, you may be discharged on the same day or the day after.

Potential risks and complications

Overall, the procedure is very safe and well tolerated. In general, major complications such as heart attack, abnormal heart rhythm, stroke, trauma to the blood vessels, major bleeding, drug allergy, need for emergency surgery, and death, occur in less than 1% of patients undergoing Percutaneous Coronary Intervention (PCI). This risk is dependent on the complexity of coronary narrowing and the patient's underlying medical conditions and may therefore be higher if the patient has comorbid conditions, eg. advanced age, kidney failure, weak heart function.

Other less serious complications occur in 1-3% and include bleeding from the puncture site, bruising and swelling of the puncture site, and blood clot formation in the artery where the sheath is inserted.

The other risks are those that pertain to local anaesthesia, sedation, and blood transfusion. Conscious sedation and local anaesthesia are generally applied to alleviate anxiety and procedure discomfort.

Following successful balloon angioplasty or stent implantation, there is still a possibility that narrowing of the heart artery may recur. This may occur either in the same area, a different segment, or a different artery. This is more likely with extensive coronary artery disease and inadequate control of risk factors.

It is therefore important for you to be compliant to the lifestyle changes, prescribed medications, and return regularly for medical reviews with your doctor.

Risks of conscious sedation and local anaesthesia

Risks of transfusion

Common (1 to 10%)

Low blood pressure

Giddiness, nausea, and/or vomiting

Pain and inflammation at injection site

Common (1 to 10%)

Skin reactions and rashes (1 to 2%), fever (0.5 to 1%)

Uncommon (0.01 to 0.1%)

Allergic reactions

Respiratory depression, which may require ventilator support

Inflammation of veins

Uncommon

Bacterial contamination during platelet transfusion (0.01 to 0.1%)

Rare (0.001 to 0.01%)

Cardiorespiratory arrest and death

Rare

Mis-transfusion (0.008%)

Viral transmission of Hepatitis B, C, HIV or etc.(0.0001 to 0.001%)

Acute haemolytic reaction (0.0002%)

Bacteria contamination (0.0001%)

To-dos after post-angiographic procedures

1 Rest in bed for 4 hours after your procedure



2 Allow your nurse to access your wound 4 hours later
@ _____ AM/PM

3 Change your position
ONLY after your nurse determines it is safe to do so

How to change your position?*



SIT - sitting on the edge of bed or chair



STAND - stretch and get out of bed



WALK - take a few steps (E.g. around the room)

*Change of position should be done under nurses' supervision. Kindly approach your nurse for more information if you have any doubts.

Start your stop smoking plan with STOP



Set - a date for stopping and stop completely.



Tell - your family, friends, and co-workers that you plan to quit. Family and friends often provide support and may help you.



Optimistic - be positive and believe in yourself that you will be able to overcome the difficulties.



Prepare - throw away all your cigarettes, vapes, lighters and ashtrays. Wash your clothes and freshen up anything that smells like smoke. Be prepared for withdrawal symptoms and how to overcome them.

Stop smoking

After Stopping	Benefits
< 30 minutes	Heart rate & blood pressure returns to normal.
8 Hours	Carbon monoxide level in blood returns to normal.
24 Hours	Risk of heart attack decreases.
72 Hours	Breathing becomes easier.
3 Months	Sperm count returns to normal.
1 Year	Risk of heart attack reduces by half.
5 Years	Stroke risk reduces.
10 Years	Risk of heart attack becomes the same as that of non-smokers and risk of cancers decreases.



Speak to your healthcare provider for a referral to the Smoking Cessation Clinic or call 6908 2222 for an appointment.

Home advice after a Percutaneous Coronary Intervention (PCI) procedure

Activities

- ♥ Refrain from physical exertions like heavy housework.
- ♥ Avoid heavy lifting of not more than 5kg until you recover.
- ♥ Take short walks or strolls depending on your physical condition.
- ♥ If you feel well after 2 weeks, gradually increase your usual activities, but stop if you feel unwell, and to inform your doctor.
- ♥ You are highly encouraged to join a cardiac rehabilitation programme to regain your confidence and ensure safe return to physical activities.

Driving

- ♥ It is recommended to avoid driving according to your doctor's advice (depending on one's condition).
- ♥ If you are presently admitted for a heart attack, it is best to avoid driving for a month.

Going back to work

- ♥ It will depend on your progress. Seek the advice of your doctor.



Medication

- ♥ Take your medications as prescribed. You should not stop your medication without consulting your doctor.

Sex

- ♥ This depends on the individual but generally you can resume your normal sexual activity 4 weeks after your procedure, only if you feel good and well rested.

Travel

- ♥ Avoid aircraft travel for 1 month or as per doctor's advice depending on one's condition.

Wound care

- ♥ If the insertion site is increasingly painful, swollen, red, bleeding, or the bruise is increasing in size, seek medical help or proceed to the Accident & Emergency (A&E).

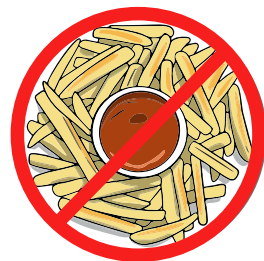
Healthy eating guide

Generally eat everything in moderation with due considerations as stated below:



1 Reduce your fat intake and limit your dietary cholesterol

- ♥ Trim visible fat off meat and poultry.
- ♥ Try low-fat cooking methods such as steaming, grilling, baking and boiling.
- ♥ Choose low-fat dairy products (e.g. low-fat milk, low-fat cheese or yoghurt).
- ♥ Replace saturated fats such as butter, ghee and lard with unsaturated fats such as margarine and canola or olive oil. Use sparingly.
- ♥ Replace coconut milk with low-fat milk.
- ♥ Egg yolks, offal (e.g. brains, liver, and kidney) and shellfish (e.g. prawns and squid) contain rich sources of dietary cholesterol. When consumed excessively, blood cholesterol may be raised.



2 Watch your salt intake

- ♥ Cut down on added salt, Monosodium Glutamate (MSG) or soya sauce.
- ♥ Limit preserved, processed and salted food such as instant noodle, canned food, preserved meat, salted eggs or salted nuts.
- ♥ Use herbs and spices to flavour your food such as fresh chilli, lime, onions, garlic, lemon and pepper.



3 Consume less sugar

- ♥ Ask for reduced sugar drinks and juices.
- ♥ Look for sugar-free products.
- ♥ Eat fresh fruits instead of drinking fruit juices.
- ♥ Save sweets, desserts, kueh, cakes, chocolates and pastries for special treats only!



4 Consume more fibre

- ♥ Try unpolished rice, wholemeal bread, chapatti and wholegrain cereals.
- ♥ Include beans, lentils and legumes in your diet.
- ♥ Eat more fruits (if you are not diabetic) and vegetables.






5 Watch your alcohol intake

- ♥ Alcoholic beverages are high in calories, therefore consumption should be reduced to control your weight and particularly if your triglyceride level is raised.



Types of Fats

<p><input checked="" type="checkbox"/></p> <p>Trans Fats</p>	<ul style="list-style-type: none"> • Hydrogenated Vegetable oils • Fast foods • Cakes/pastries • Chocolate • Deep Fried Food 		
<p><input checked="" type="checkbox"/></p> <p>Saturated Fats</p>	<p>Vegetable Fats</p>	<ul style="list-style-type: none"> • Coconut • Palm oil • 3-in-1 & 2-in-1 beverage, creamer, condensed milk 	
	<p>Animal Fats</p>	<ul style="list-style-type: none"> • Poultry skin • Fatty meat • Butter • Ghee • Tallow/lard • Full-cream dairy products 	
<p><input checked="" type="checkbox"/></p> <p>Unsaturated Fats</p>	<p>Poly-unsaturated</p>	<ul style="list-style-type: none"> • Corn oil • Soybean oil • Sunflower oil • Seeds • Cold-water fish 	
	<p>Mono-unsaturated</p>	<ul style="list-style-type: none"> • Olive oil • Canola oil • Peanut oil • Sesame oil • Avocado • Most nuts 	

Medicine and your heart

After your interventional treatment, your doctor may prescribe medications to help prevent complications. These medications may include:

Class of medicines	Examples of members in class	Use of medicines	Common side effects	Precautions and advice
Anticoagulants	<ul style="list-style-type: none"> • Warfarin • Heparin • Apixaban • Rivaroxaban • Dabigatran 	Prevent or slow the clotting of blood.	<ul style="list-style-type: none"> • Bleeding / bruising • Nosebleeds • Bleeding gums • Heavy menstrual bleeding 	<p>Follow the prescribed dosage and schedule strictly.</p> <p>Inform your healthcare provider about any other medications or supplements you are taking.</p>
Antiplatelets	<ul style="list-style-type: none"> • Aspirin • Clopidogrel • Ticlopidine • Prasugrel • Ticagrelor 	Prevent clot formation and reduce risk of stroke and heart attack.	<ul style="list-style-type: none"> • Bleeding/ • Bruising • Gastric irritation (Aspirin) 	Monitor for signs of bleeding (e.g. gum/nose bleeds, blood in urine/stools, heavy menstrual period, if applicable).
Betablockers	<ul style="list-style-type: none"> • Atenolol • Bisoprolol • Carvedilol • Labetolol • Metoprolol • Nebivolol 	<p>Reduce workload and oxygen demands of the heart to cope with reduced blood supply.</p> <p>Also helps to control blood pressure, chest pain, heart rate and to prevent second heart attack.</p>	<ul style="list-style-type: none"> • Slow heart rate • Tiredness • Dizziness • Cold hands and feet • Shortness of breath 	Do not stop your medication without consulting your doctor.
ACE inhibitors	<ul style="list-style-type: none"> • Captopril • Enalapril • Lisinopril • Perindopril • Ramipril 	<p>Prevent heart from weakening further.</p> <p>Also helps control blood pressure to prevent heart attack, stroke and kidney failure.</p>	<ul style="list-style-type: none"> • Dizziness • Dry cough • May increase potassium level 	<p>Rise slowly from sitting/lying position to prevent dizziness.</p> <p>Consult a doctor if you experience persistent dry cough.</p> <p>Do not take additional potassium supplements other than those prescribed by the doctor and avoid using salt substitutes.</p>
Angiotensin II antagonist	<ul style="list-style-type: none"> • Candesartan • Irbesartan • Losartan • Telmisartan • Valsartan 		<ul style="list-style-type: none"> • Dizziness • May increase potassium level 	<p>Rise slowly from sitting/lying position to prevent dizziness.</p> <p>Do not take additional potassium supplements other than those prescribed by the doctor and avoid using salt substitutes.</p>
Vasodilators	<ul style="list-style-type: none"> • Glyceryl Trinitrate • Isosorbide Dinitrate • Isosorbide Mononitrate 	Relax blood vessels to reduce blood pressure and chest pain. Increase blood and oxygen supply to the heart.	<ul style="list-style-type: none"> • Headache • Flushing • Dizziness • Palpitations 	Rise slowly from sitting/lying position to prevent dizziness.

Class of medicines	Examples of members in class	Use of medicines	Common side effects	Precautions and advice
Lipid lowering agents	<ul style="list-style-type: none"> • Atorvastatin • Lovastatin • Pravastatin • Simvastatin • Rosuvastatin 	Reduce production of cholesterol.	<ul style="list-style-type: none"> • Muscle pain or stiffness • Constipation • Abdominal pain 	Consult a doctor if you experience: <ol style="list-style-type: none"> 1. Unexplained muscle pain, tenderness, or weakness. 2. Pale stools/tea-colored urine, yellowing of skin/eyes, abdominal pain. 3. Severe nausea/vomiting. Avoid excess alcohol intake to minimize risk of liver injury. Avoid grapefruit juice.
	<ul style="list-style-type: none"> • Fenofibrate • Gemfibrozil 	Reduce fat formation.	<ul style="list-style-type: none"> • Muscle pain or stiffness • Abdominal pain 	Consult a doctor if you experience: <ol style="list-style-type: none"> 1. Unexplained muscle pain, tenderness, or weakness. 2. Pale stools/tea-colored urine, yellowing of skin/eyes, abdominal pain. 3. Severe nausea/vomiting.
Diuretics	Loop diuretic <ul style="list-style-type: none"> • Frusemide • Bumetanide • Thiazide diuretic • Metolazone 	Remove excess water in the body by increasing urination.	<ul style="list-style-type: none"> • Low mineral levels (e.g. sodium, potassium) 	Rise slowly from sitting/lying position to prevent dizziness.
	Potassium sparing diuretic <ul style="list-style-type: none"> • Amiloride • Eplerenone • Spironolactone 	For twice-daily dosing, take the second dose no later than 5pm to prevent urination at night.	<ul style="list-style-type: none"> • May increase potassium level 	Do not take additional potassium supplements other than those prescribed by the doctor and avoid using salt substitutes.
Potassium supplements	<ul style="list-style-type: none"> • Potassium chloride 	Supplement for the loss of potassium (due to the effect of loop or thiazide diuretics).		
Calcium channel blockers	<ul style="list-style-type: none"> • Amlodipine • Diltiazem • Felodipine • Nifedipine • Verapamil 	Reduce oxygen demands and workload of the heart. Relax blood vessels to reduce blood pressure and chest pain.	<ul style="list-style-type: none"> • Headache/ Dizziness • Flushing • Constipation (Verapamil) • Swelling of legs 	Consult a doctor if you experience severe breathlessness or leg swelling. Avoid alcohol and grapefruit juice.

Do not stop your medications even if you feel better, this is to prevent complications such as stroke and heart attack. Inform your doctor or pharmacist if side effects persist or if you experience any allergic reaction such as itch, rashes, facial or eye swelling.

What does angina feel like?

Angina refers to chest pain caused by inadequate blood supply to the heart.

You may experience any of the following:

- ♥ Temporary pain, tightness or discomfort in the centre of the chest.
- ♥ Pain may spread to both sides of the chest, neck, jaws, shoulders and down the inner sides of the arm.
- ♥ A feeling of pressure in the chest.

Angina can be relieved by rest. Usually, the heart muscle does not suffer any permanent damage.

What does a heart attack feel like?

You may experience any of the following:

- ♥ Prolonged or severe chest pain, discomfort or pressure.
- ♥ The pain may radiate to the neck, jaws, shoulders, arms, back or upper abdomen.
- ♥ Severe shortness of breath.
- ♥ Excessive sweating.
- ♥ New or very severe palpitation (when you feel your heart is beating very fast). There may be nausea, vomiting, gastric discomfort, dizziness or weakness.



A heart attack cannot be relieved by rest. Often, part of the heart muscle dies.

What to do if you are having chest pain during angina or a heart attack?

- 1 Take a GTN (Glyceryl Trinitrate) tablet or spray.
- 2 If the pain is not relieved after 5 minutes, you may take a second GTN tablet/spray. If pain persists after 5 minutes, take a third tablet/spray.
- 3 However, if you still feel pain, please **call 995 for an ambulance to the A&E.**

Managing Coronary Artery Disease (CAD) after a PCI procedure

Once a CAD care plan has been established by your doctor, its success depends on your willingness to see it through.

- ♥ **If you smoke, plan to stop.** Reach out to supportive groups and consider medications for easier smoking cessation.
- ♥ **Try to lose weight, even if it's only a few kilograms.** Even a 2.5 to 5 kg weight loss can significantly reduce your risk of heart disease.
- ♥ **Make moderate exercise a part of your daily routine.** Regular exercise burns fat and releases endorphins and vasodilators, maintaining healthy blood vessels.
- ♥ **Monitor your blood pressure, cholesterol, and blood sugar regularly.** Control your sodium intake, eat healthily, exercise regularly, and take your prescribed medications.
- ♥ **Visit your doctor regularly.** After being diagnosed with CAD, prioritize regular check-ups.



- ♥ **Make changes gradually.** Work towards a realistic goal to lose weight. To cut sugar, eliminate desserts gradually. Small changes increases the chance of making a permanent change. It is difficult to become a new person overnight. Pick a couple of areas to improve. Setting achievable goals can lead to surprising success.
- ♥ **Enlist the support of friends or family members.** Invite a friend to accompany you on walks or gym visits for a more fun and sustainable experience.
- ♥ **Take your prescribed medications.** Do not stop any medication on your own. If you have any doubts, discuss with your healthcare provider.
- ♥ **Risk factors for heart disease can be controlled with improved lifestyle options.** If you have any questions about the above risk factors, and how to modify them, you may seek help from your nurse, surgeon or cardiologist, or request to see a Health Coach at NUHCS for more information.

Cardiac Rehabilitation Programme at NUHCS



Scan for Healthy
Heart Resources

This is a structured programme aimed at helping you to ease through the recovery period and gradually improve your heart fitness and live a healthier life. It will help you identify and change those behaviours or risk factors that may have contributed to the development of coronary artery disease.

The programme consists of:

- ♥ Prescribed exercise training
- ♥ Health education
- ♥ Risk factor modification (including management of stress and anxiety)



The team, which comprises a doctor, physiotherapist, case manager, dietician, pharmacist, occupational therapist and medical social worker, will guide and encourage you through your recovery journey.



To find out more about the Cardiac Rehabilitation Programme at NUHCS, please visit our website at <https://www.nuhcs.com.sg/Our-Services/Specialties/Pages/Cardiac-Rehabilitation-Programme.aspx>

To register for the Cardiac Rehabilitation Programme, please consult your Cardiologist during your stay in the hospital or during your outpatient review appointment.

Definitions of common Coronary Artery Disease terms

If you are unsure about what any of these terms mean, please check with your doctor.

- ♥ **Angina** – Chest pain caused by inadequate supply of blood to the heart.
- ♥ **Angiogram** – A minimally-invasive procedure to allow your doctor to see blockages or narrowings in your coronary arteries on X-rays.
- ♥ **Angioplasty** (also referred to as Percutaneous Coronary Intervention (PCI)) – A minimally-invasive procedure involving a balloon dilation catheter being passed through to the blocked area of an artery. Once inflated, the balloon compresses the plaque against the blood vessel wall. An angioplasty can also be performed with a stent.
- ♥ **Anticoagulant** – A medication to prevent or slow the clotting of blood.
- ♥ **Artery** – Muscular, walled tubes that are a part of the circulation system and are used to carry blood from the heart to various parts of the body.
- ♥ **Atherosclerosis** – A disease that causes narrowing or blockage of arteries caused by a build-up of fat (cholesterol) within the artery wall. This build-up is sometimes referred to as “plaque.”
- ♥ **Beta-blockers** – Post-CAD treatment medication that slows the heart rate and lowers blood pressure.
- ♥ **Calcium channel blocker** – Post-CAD treatment medication that slows the heart rate, lowers blood pressure, helps widen coronary arteries, and reduces angina.
- ♥ **Catheter** – A thin, hollow, flexible tube used to access the coronary arteries during an angiogram or during an angioplasty procedure. The catheter can be used to inject medication, fluids, or X-ray dye during your procedure. The word catheter is also used to describe the device used to deliver the balloon or stent during an angioplasty procedure.

- ♥ **Coronary arteries** – The blood vessels that carry oxygenated blood from the main artery (aorta) to the heart muscles. There are three major coronary arteries: the right coronary artery, the left anterior descending, and the left circumflex.
- ♥ **Coronary Artery Disease (CAD)** – The formation of blockages or atherosclerotic plaques within the coronary arteries that result in restricted blood flow to the heart muscle.
- ♥ **Drug-Eluting Stent (DES)** – A metallic stent that has been coated with a drug to help reduce the risk of restenosis.
- ♥ **Electrocardiogram (ECG/EKG)** – A test that records changes in the electrical activity of the heart. An ECG/EKG may show whether parts of the heart are damaged due to decreased blood flow to the heart muscle.
- ♥ **In-stent restenosis** – Recurrent blockage or re-narrowing within a previously stented segment of the artery.
- ♥ **Local anesthetic** – A substance used to numb the area to which it is applied.
- ♥ **Nitrates** – CAD medication that relieves chest pain and other symptoms of angina.
- ♥ **Plaque** – An accumulation or build-up of fatty deposits, calcium, white blood cells, and other substances in the wall of an artery that results in narrowing of the inside of the artery through which blood flows.
- ♥ **Restenosis** – A recurring blockage caused by excessive cell growth inside the artery or stent following an interventional procedure such as angioplasty. When a stent has been used, restenosis within the stented segment is called in-stent restenosis.
- ♥ **Statin** – Post-CAD treatment that lowers cholesterol, which may reduce the risk of heart attack.

National University Heart Centre, Singapore (NUHCS)



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- NUHCS at National University Hospital (NUH), Kent Ridge - Main Operations
Main Building Zone F
Operating Hours: 8:00am - 5:30pm (Monday - Friday)
Closed on Weekends & Public Holidays
- NUHCS Heart Clinic @ Ng Teng Fong General Hospital (NTFGH)
Tower A - Specialist Outpatient Clinics Level 3, Clinic A34
Operating Hours: 8:00am - 5:30pm (Monday - Friday)
8:30am - 12:30pm (Saturday)
Closed on Sundays & Public Holidays
- NUHCS Heart Clinic @ Alexandra Hospital (AH)
Operating Hours: 8:30 am - 5:30 pm (Monday - Friday)
Closed on Weekends & Public Holidays
- NUHCS Heart Clinic @ Jurong Medical Centre (JMC)
Operating Hours: 8:30 am - 5:30 pm (Monday - Friday)
Closed on Weekends & Public Holidays

Hotline: (65) 6908 2222

Appointments: appointment@nuhs.edu.sg

General Enquiries: contactus@nuhs.edu.sg

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