

HEART SERIES H3

# UNDERSTANDING HEART DISEASE



Chest  
Heart &  
Stroke  
Scotland





**Chest Heart & Stroke Scotland improves the quality of life for people in Scotland affected by chest, heart and stroke illness, through medical research, influencing public policy, advice and information and support in the community.**

The information contained in this booklet is based on current guidelines and is correct at time of printing. The content has undergone peer, patient and expert review.

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# UNDERSTANDING HEART DISEASE

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## **INTRODUCTION**

This booklet is designed to help you understand how the heart works and what can go wrong. It offers a general introduction to the most common heart problems.

Sometimes more than one problem can occur with the heart at the same time, and one problem can also lead to another.

Heart problems affect everyone differently – this is why two people with the same diagnosis may not always be given the same treatment.

This booklet cannot address every aspect of heart disease.

The full list of relevant CHSS factsheets and booklets can be found on the inside back cover of this booklet.

Please note that this booklet does not specifically cover congenital heart disease. Contact details for The Somerville Foundation can be found in the 'Useful addresses and websites' section of this booklet.

## HOW THE HEART WORKS

The heart is the pump at the centre of the body's circulation system.

This system ensures that fresh blood, containing oxygen and nutrients, is delivered throughout the whole body, and carbon dioxide and waste products are taken away.

### Network of blood vessels

Blood is pumped around the body through a network of blood vessels:

- Arteries transport oxygen-rich blood from the heart to all parts of the body. The arteries get smaller as they get further away from the heart.
- Capillaries are the smallest of blood vessels. They connect the smallest arteries to the smallest veins. This is where oxygen, carbon dioxide, nutrients and waste products are exchanged.
- Veins carry blood, lacking in oxygen, back towards the heart. The veins get bigger as they get nearer the heart.

### Pumping action of the heart

One heartbeat is a single cycle in which your heart's chambers contract (squeeze) and relax to pump blood. At rest the normal heart beats approximately 60 - 80 times per minute. Approximately 100,000 times a day! This increases when you exercise.

The heart is a **muscular pump** made up of four chambers. These are the right and left atria and the right and left ventricles.

To ensure an adequate blood supply to the whole body the four chambers have to pump regularly and in sequence.

There are two phases to the heart's pumping cycle: systole and diastole. Systole is when the heart contracts, pushing blood out of the chambers. Diastole is the period between contractions when the muscle of the heart (myocardium) relaxes and the chambers fill with blood.

A series of four **valves** keep the blood moving in the right direction.

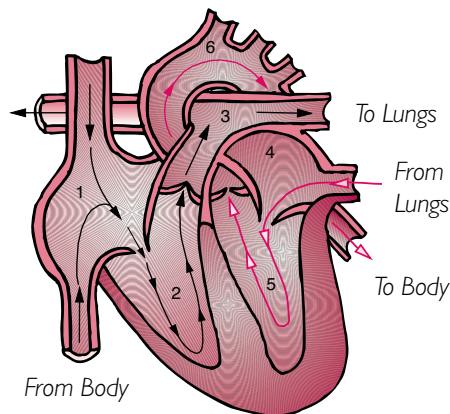
The pumping action of the four chambers is co-ordinated by **electrical signals** telling the heart when to contract and relax.

The heart also requires its **own blood supply** to keep it working efficiently.

### **Movement of blood through the heart**

Blood from the muscles and organs of the body enters the right side of the heart into the right atrium (1). It is pumped to the right ventricle (2) and from there the heart pumps the blood to the lungs, where it takes up oxygen and gets rid of the carbon dioxide it has been carrying (3).

Figure 1.  
Diagram of the  
flow of blood  
through the heart



This oxygen-rich blood then enters the left side of the heart into the left atrium (4). It is pumped into the left ventricle (the strongest of the four chambers) (5) and from there it is pumped into the aorta (largest blood vessel in the body) (6) to all parts of the body including the heart muscle itself.

So, in order for the heart to function properly, it needs all of the following to work efficiently:

- the heart's pumping action
- the blood supply to the heart itself
- the heart's electrical system
- the heart valves

### **What can go wrong with the pumping action?**

There are some conditions which can lead to damage to the heart muscle making it weak and unable to pump as efficiently as before.

For example:

- persistent high blood pressure
- heart valve problems
- heart attack / chronic angina
- chronic obstructive pulmonary disease

When the heart muscle can not meet the body's demands for blood and oxygen the body develops a range of different symptoms. When this happens it is referred to as heart failure because of the failure of the heart to work efficiently.

## **Heart failure**

Symptoms of heart failure may appear quickly (over a few days) or develop more slowly (over weeks or even months). Heart failure is treated mainly with drugs to make the work of the heart easier. It is important to remember that other conditions can also produce similar symptoms.

Typical physical symptoms include:

- shortness of breath at rest or during physical exertion
- waking up at night feeling short of breath
- fluid retention i.e. swelling of the ankles, feet or legs
- lack of energy
- palpitations (a sensation of the heart pounding or racing)
- discomfort, or tightness, in the chest during physical exertion

*See the CHSS booklet 'Living with heart failure' for more information.*

## **Cardiomyopathy**

Cardiomyopathy is a heart muscle disease which affects the heart's ability to pump blood around the body. There are several different types of cardiomyopathy e.g. dilated cardiomyopathy and hypertrophic cardiomyopathy.

*For more information on cardiomyopathy contact the Cardiomyopathy Association (see Useful addresses and websites at the end of this booklet).*

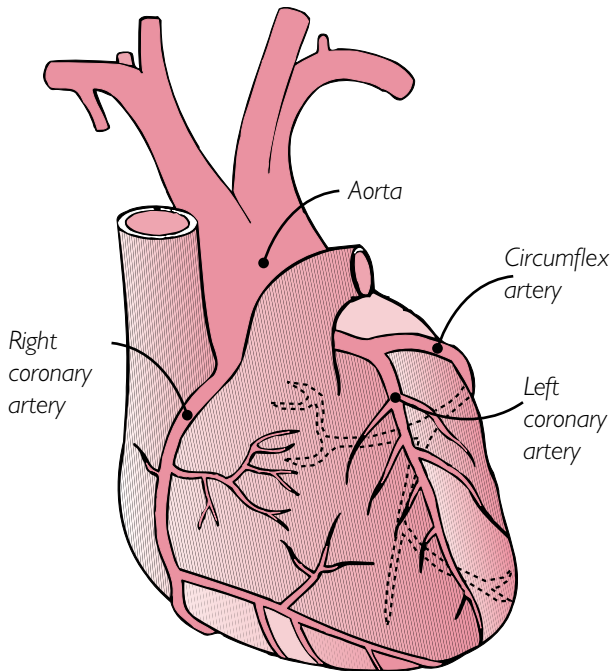


## THE BLOOD SUPPLY TO THE HEART

The heart muscle has to work very hard to ensure an adequate blood supply is pumped to the whole body. Because the heart is a muscle, it requires its own efficient blood supply to provide it with the oxygen and nutrients it needs.

It gets this blood supply from the three main coronary arteries, which lead straight off the main blood vessel, called the aorta.

Figure 2



## **What can go wrong with the blood supply?**

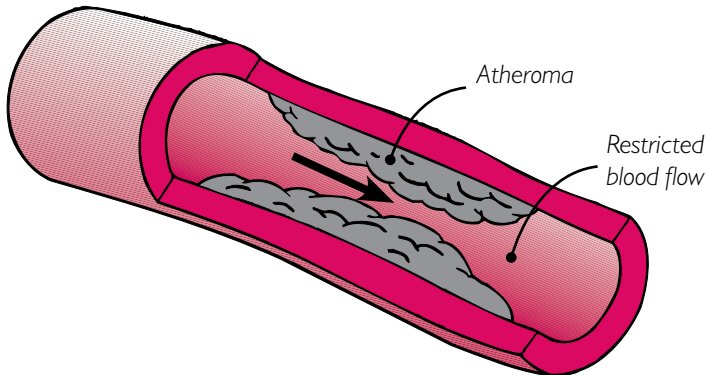
If the coronary arteries are narrowed or blocked then the blood supply to the heart will be impaired. This is the most common form of heart disease, known as coronary artery disease (sometimes called coronary, or ischaemic, heart disease).

In coronary artery disease a fatty substance, called atheroma, builds up in the lining of one (or more) of the coronary arteries (see figure 3). This narrows the artery and causes a restricted blood flow. This process, known as atherosclerosis, can lead to angina and / or heart attacks.

- Angina (chest pain / breathlessness) happens when the blood supply to the heart becomes *restricted*. Angina is the heart's way of complaining that it is not getting enough oxygen during physical exertion or stress.
- Unstable angina happens when the blood supply to the heart is *severely restricted*. This type of chest pain / breathlessness can happen at rest or during the night. This can be angina that is experienced for the first time or a sudden worsening of existing angina.
- A heart attack (also known as myocardial infarction or MI) happens when the blood supply to the heart becomes *completely blocked*, either by the formation of a blood clot or by a loose piece of atheroma. This can result in damage to the part of the heart muscle which that particular coronary artery was supplying.

- Sometimes, when chest pain occurs suddenly it is unclear if it is due to unstable angina or a heart attack. Until tests confirm the diagnosis doctors sometimes call this Acute Coronary Syndrome (ACS).

Figure 3. Diagram of atheroma



Chest pain can sometimes start off as a dull pain or ache. This can also be present in the back / neck / arm. It has been described as heaviness, burning, tightness, constriction or squeezing sensation, a heavy weight or pressure. For some people chest pain can feel similar to indigestion or heartburn.

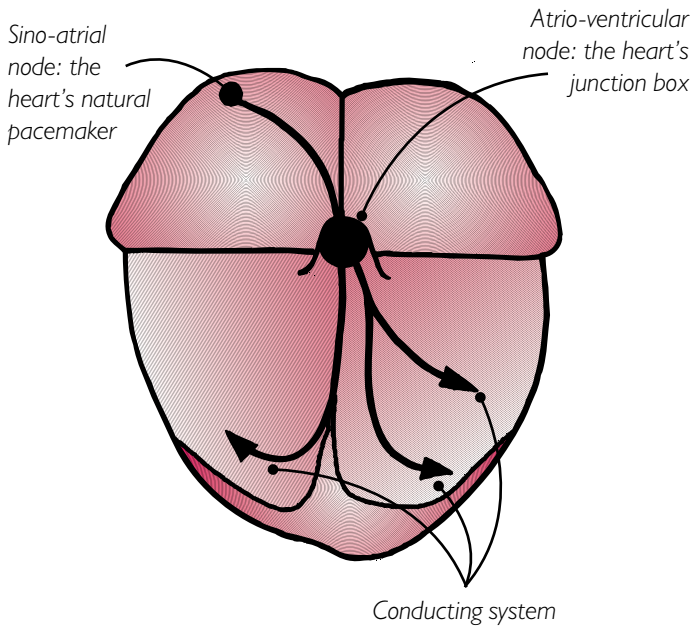
**Do not be afraid to seek urgent medical help if you have suspect that you have symptoms of angina or a possible heart attack.**

See the CHSS booklets 'Living with angina' and 'Heart attack: a guide to your recovery' for more information.

## THE HEART'S ELECTRICAL SYSTEM

The muscular pumping action of the heart is triggered by electrical signals which are sent through the heart muscle telling it when to contract and relax.

Figure 4. Diagram of electrical pathway



The electrical signal starts in the right atrium (see figure 4) where the heart's natural 'pacemaker', called the sino-atrial node, is situated. This signal crosses the atria, making them contract. Blood is then pumped through the valves into the ventricles.

Where the atria meet the ventricles there is an area of special cells, called the atrio-ventricular node. These cells act as a 'junction box' and pass the electrical signals throughout the heart muscle by a system of electrical pathways, known as the conducting system. This makes the muscles of the ventricles contract. Blood is then pumped through the pulmonary and aortic valves into the main arteries.

The 'pacemaker' produces another electrical signal and the cycle starts again.

### **What can go wrong with the electrical system?**

Normally the heart will beat between 60 and 80 times per minute. This regular rhythmic beating is dependent upon electrical signals being conducted throughout the whole heart.

If the electrical signals within the heart are interrupted or disturbed then the heart can beat too quickly (tachycardia), too slowly (bradycardia) and / or in an irregular way. This is called an arrhythmia.

Common causes of arrhythmias include: complications from a heart attack or heart surgery, coronary artery disease, high blood pressure and heart valve problems.

There are many different types of arrhythmias some of which are normal and harmless. Occasional tachycardia or irregular arrhythmias can often be the result of taking everyday stimulants, such as caffeine found in fizzy drinks and coffee. Cigarettes,



alcohol, stress and illegal drugs (e.g. cocaine) can also be responsible for arrhythmias. Making changes to your lifestyle to eliminate these factors can often be the solution.

Some arrhythmias are more serious and will need to be corrected.

### **Atrial fibrillation (AF)**

This is the most common type of arrhythmia. In AF the atria or ventricles may not be completely emptied with each heartbeat. This leaves a pool of blood which may clot. If a blood clot enters the blood stream it can lead to a stroke.

Most types of AF can be controlled with medicines by stabilising the heart and thinning the blood.

*See the CHSS booklet 'Understanding atrial fibrillation' for more information.*

### **Artificial pacemaker devices**

Depending on your symptoms your heart specialist may suggest fitting an artificial pacemaker device. This will monitor how your heart is beating and correct any problems by stimulating the heart chambers to beat more regularly to meet your body's needs.

*See the CHSS booklet 'Living with a pacemaker device' for more information.*

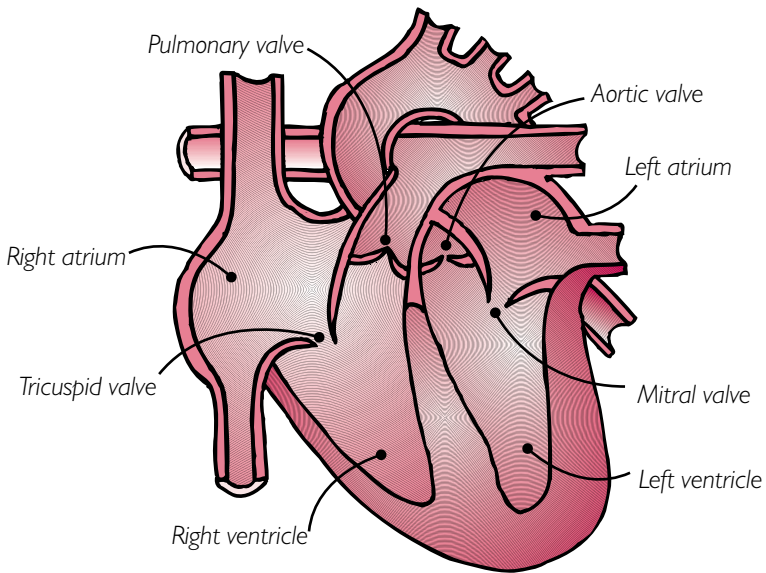
**If you notice a sudden change in your heartbeat and / or have chest pain you should always seek urgent medical advice.**

## THE HEART VALVES

The movement of blood through the heart is regulated by a system of valves which ensure that the blood flows in the correct direction.

There are four valves: the aortic, mitral, pulmonary and tricuspid valves. These are shown in figure 5.

Figure 5. Diagram of heart valves



### What can go wrong with the valves?

The heart cannot function normally if the valves are not working properly. There are two main ways that the valves can be affected:

- Valves can leak, which is called valve regurgitation (sometimes called valve incompetence). When this happens there is backflow of blood through the 'leaky valve'.

- Valves can narrow and become stiff. This is called valve stenosis and can lead to restriction of the blood flow through the narrowed valve.

Any of the four valves can leak or narrow and in some cases they are both leaky and narrowed at the same time. Problems with valves increase the workload of the heart and can put a strain on the heart muscle. As the left side of the heart works the hardest to pump the blood, the aortic and mitral valves are most commonly affected by disease.

- Aortic valve regurgitation can cause the heart to enlarge, causing breathlessness.
- Aortic valve stenosis can cause angina, breathlessness and blackouts.
- Mitral valve regurgitation or stenosis can cause breathlessness, dizziness and angina.

Sometimes the aortic and mitral valves can both be affected at the same time.

If the heart valves are not working properly then you may also experience tiredness and swelling of the ankles. This is because the heart is not able to work efficiently enough to meet the body's needs and may lead to heart failure.

*See the CHSS booklet 'Understanding heart valve problems' for more information.*



## DRUGS COMMONLY USED IN HEART DISEASE

Your doctor will try and find the most effective ones for you with the fewest side effects.

Some people with heart disease have to take several different drugs every day. This can sometimes be difficult to deal with but try and remember your doctor is trying to keep you as well as possible and is following proven advice.

Always take your medicine as prescribed by your doctor. Report any side effects but do not stop taking a medicine suddenly or without your doctor's advice.

Discuss all over-the-counter remedies with your pharmacist to make sure they won't interact with any prescribed drugs you are taking.

The following is a list of drugs that are commonly used in heart disease. These have been listed in alphabetical order, in drug groups and given their generic (chemical) name.

Different manufacturers use different brand names for the same drug so you may find that the packaging and the name on the packet you get from your pharmacy varies sometimes. The ingredients will tell you the name of the drug the packet contains.



***New drugs are under trial all the time and even when they become licensed it may still be some time before they are seen to be widely used.***

Drug Group Name and examples	How they work/ action	Possible common side effects	Additional info	When used
ACE Inhibitors (Angiotensin Converting Enzyme inhibitors) <ul style="list-style-type: none"> <li>• captopril</li> <li>• enalapril</li> <li>• lisinopril</li> <li>• ramipril</li> <li>• fosinopril</li> <li>• perindopril</li> <li>• trandolopril</li> </ul>	Reduce blood pressure and increase cardiac output (improve the efficiency of the heart).	Persistent cough, dizziness, kidney problems.	ACE inhibitors are usually started with a small dose and increased gradually to prevent dizziness (due to blood pressure being lowered). Sometimes taking it at night can help if you have dizziness. Avoid salt substitutes.	High blood pressure, coronary artery disease such as after a heart attack or unstable angina episode and in the treatment of heart failure or after a stroke.
Aldosterone antagonists: <ul style="list-style-type: none"> <li>• spironolactone</li> <li>• eplerenone</li> </ul>	These remove excess fluid from the body by increasing urine volume. This lowers the blood pressure and eases the workload of the heart.	May cause nausea, gastro-intestinal disturbances or kidney problems. Spironolactone can cause breast swelling and tenderness.	Avoid salt substitutes.	High blood pressure, heart failure.
Alpha blockers <ul style="list-style-type: none"> <li>• doxazosin</li> <li>• indoramin</li> <li>• prozosin</li> <li>• terazosin</li> </ul>	Relax blood vessel walls to reduce blood pressure.	Nausea, dizziness on standing.		High blood pressure. Often used when other medicines not effective.
Anti-arrhythmics: <ul style="list-style-type: none"> <li>• flecainide</li> <li>• amiodarone</li> <li>• dronedarone</li> </ul>	Regulate the electrical system of the heart.	Can cause nausea, slow pulse, dizziness, sight disturbances, taste disturbances.	Liver and thyroid gland function may be checked when on amiodarone. Amiodarone also increases sensitivity to sunburn, use a high factor sun cream.	To correct fast or irregular heart beats (arrhythmias).

Drug Group Name and examples	How they work/ action	Possible common side effects	Additional info	When used
Anticoagulants: <ul style="list-style-type: none"> <li>• warfarin</li> </ul> New anticoagulants: <ul style="list-style-type: none"> <li>• dabigatran</li> <li>• rivoroxaban</li> </ul>	Interfere with blood clotting, making the formation of clots more difficult.	Because anticoagulants increase the risk of bleeding, it has to be taken with some caution and is not suitable for everybody.  Risk of bleeding and digestive symptoms such as nausea and heartburn.	For warfarin, regular blood tests are needed to establish the dose. Report any changes that could be an indication of bleeding problems, such as frequent nosebleeds, bruising easily, dark coloured urine or bowel motions. With warfarin, avoid cranberry juice.	When high risk of blood clots e.g. valve problems, after valve surgery and heart rhythm problems such as atrial fibrillation.
Antiplatelets: <ul style="list-style-type: none"> <li>• aspirin</li> <li>• clopidogrel</li> <li>• ticagrelor</li> <li>• prasugrel</li> </ul>	Blood clotting occurs due to special cells, called platelets, sticking together. Antiplatelets drugs make this harder to do. Reduces the risk of developing blood clots used to prevent heart attacks and strokes.	Can cause stomach irritation, headache and bruising.	Take with food.  Do not take additional medicines containing aspirin.  Report black bowel motions to your doctor immediately, as this may indicate bleeding from gut.	As a preventative measure in coronary heart disease, and early treatment of heart attack.  Combination of aspirin and one other used after angioplasty and stents.
ARBs (Angiotensin II receptor blockers) <ul style="list-style-type: none"> <li>• candesartan</li> <li>• losartan</li> <li>• irbesartan</li> <li>• valsartan</li> </ul>	Reduce blood pressure and increase cardiac output (improve the efficiency of the heart).	Can cause dizziness, kidney problems.	ARBs are usually started with a small dose and increased gradually to prevent dizziness (due to blood pressure being lowered). Sometimes taking it at night can help if you have daytime dizziness. Avoid salt substitutes.	High blood pressure and in addition or as a substitute to ACE-inhibitors.

Drug Group Name and examples	How they work/ action	Possible common side effects	Additional info	When used
Betablockers: <ul style="list-style-type: none"> <li>• atenolol</li> <li>• bisoprolol</li> <li>• metoprolol</li> <li>• carvedilol</li> <li>• labetalol</li> </ul>	Reduce blood pressure, lower heart rate and ease workload of the heart.	Can cause fatigue, dizziness, cold fingers/toes, sleep disturbance/nightmares, male impotence.	Discuss impotence with your nurse/doctor.  Usually avoided in people with asthma and chest problems.	High blood pressure, after a heart attack, angina, heart failure and heart rhythm problems (arrhythmias).
Calcium channel blockers: <ul style="list-style-type: none"> <li>• amlodipine</li> <li>• nifedipine</li> <li>• diltiazem</li> <li>• verapamil</li> </ul>	Relax blood vessels to reduce blood pressure and decrease workload of the heart. Verapamil and diltiazem can also be used to reduce heart rate.	Can cause flushing, headaches, dizziness, stuffy nose, nausea, palpitations, slow pulse and ankle swelling.	Avoid grapefruit juice with CCBs except diltiazem.	High blood pressure, angina and can be used in place of beta-blockers.
Digoxin	Slows heart rate and can improve the efficiency of the heart.	Nausea, gastro-intestinal disturbances, abnormal heart rhythm.	Blood levels may be needed to determine correct dose.	Atrial fibrillation, heart failure.
Diuretics: <ul style="list-style-type: none"> <li>• furosemide</li> <li>• bumetanide</li> <li>• bendroflumethiazide</li> <li>• indapamide</li> <li>• chlortalidone</li> </ul>	These remove excess fluid from the body by increasing urine volume.  This lowers the blood pressure and eases the workload of the heart.	Can cause tiredness, muscle cramps, gout and kidney problems.	Can make the body lose potassium.  Report diarrhoea & vomiting lasting over 24 hours.	High blood pressure, heart failure.
Ir channel blocker: <ul style="list-style-type: none"> <li>• ivabradine</li> </ul>	Lowers heart rate	Can cause some reversible visual disturbance.	Sometimes used when beta-blockers or some calcium channel blockers cannot be used.	Angina

Drug Group Name and examples	How they work/ action	Possible common side effects	Additional info	When used
Nitrates: <ul style="list-style-type: none"> <li>glyceryl trinitrate ( spray/ tablets)</li> <li>isosorbide mononitrate</li> <li>nitrate patches</li> </ul>	Relax blood vessels, lower blood pressure and reduce the workload of the heart.	Can cause headache, flushing, dizziness and nausea.	Headache particularly on first taking. Flushing eases as dose increases slowly Avoid taking Viagra®, or similar products, with nitrates.	Angina, heart failure, high blood pressure.
Opiates: <ul style="list-style-type: none"> <li>morphine</li> </ul>	Relieve breathlessness and/or pain.	Can cause constipation and tiredness.		To relieve pain and distress. Can also be used to improve shortness of breath in heart failure.
Potassium channel activators: <ul style="list-style-type: none"> <li>nicorandil</li> </ul>	Relax smaller blood vessels and reduce the workload of the heart.	Can cause dizziness, headache and flushing.		Treatment of angina.
Statins: <ul style="list-style-type: none"> <li>simvastatin</li> <li>atorvastatin</li> <li>pravastatin</li> <li>fluvastatin</li> <li>rosuvastatin</li> </ul>	Lower LDL (bad cholesterol) and reduce the risk of coronary heart disease.	Can cause nausea, stomach upsets, headache, muscle pains and fatigue.	Avoid grapefruit juice when taking simvastatin.	Prevention of coronary events and after coronary events.
Other anti angina drug: Ranolazine			Sometimes used when other angina medicines are ineffective or cannot be tolerated due to side effects.	Angina

## **UNDERSTANDING TESTS FOR HEART DISEASE**

### **Blood tests**

Routine blood tests include:

- Full blood count (FBC): this test measures the levels of red blood cells, white blood cells and platelets. It also measures the haemoglobin (oxygen-carrying component of red blood cells).
- Urea and Electrolytes (U's & E's): Urea is a waste product normally excreted in the urine.

Electrolytes are salts such as sodium, potassium and minerals such as calcium. Abnormal results should be looked into and corrected to ensure maximum stability in heart health.

- Glucose: this test measures the level of sugar in the blood.
- Liver and thyroid function.

### ***Troponin blood test***

You may also have a troponin blood test. Troponin is a protein which is released into the blood stream when the heart muscle is damaged. The troponin level provides a quick and accurate measure of any heart muscle damage. It is used to help diagnose a heart attack and may need to be taken on admission and / or 12 hours from the onset of symptoms.

### **Chest x-ray**

A chest x-ray is useful for showing the size and shape of the heart and detecting lung disorders. It can also show any fluid in the lungs, which may be caused by heart problems.

## **ECG**

ECG stands for electrocardiogram, which gives a recording of the electrical activity of the heart in the form of a graph. Electrodes, attached to sticky patches, are positioned on your chest, wrists and ankles and a recording is made.

Each lead gives a view of the electrical activity of the heart from a particular angle across the body. The ECG reflects what is happening in different areas of the heart and helps to show up any abnormality in conduction.

An ECG is painless and the procedure usually takes about 5-10 minutes.

### **24-hour ECG**

This is sometimes referred to as an ambulatory ECG. This is the same as an ordinary ECG but has fewer electrodes than a standard ECG. These electrodes are connected to a small box attached to a belt which you wear for 24 hours, as you go about your normal daily activities.

A 24hr ECG records the information on a tape, which can then be analysed by your doctor. This is very helpful in looking at irregular heart rhythms that come and go. It can also be used to confirm whether or not symptoms experienced are heart related.

### **Exercise ECG**

Also known as a 'stress test' or 'treadmill test'. This is a variation on an ECG, which records the activity of the heart as you make it work harder by walking and talking



on a treadmill. You will be closely monitored by medical staff during this test.

An exercise ECG records changes that the heart experiences due to an insufficient blood supply. It can be used to confirm a diagnosis of angina and assess its severity.

Not everyone will be able or fit enough to have this test.

### **Angiogram**

This is an x-ray examination of the heart (also called cardiac catheterisation) which is used to assess damage to the coronary arteries. A catheter (tube) is inserted, under local anaesthetic, into a main artery in the upper leg or lower arm and then passed gently into the aorta (which supplies the heart muscle with its own blood supply).

A dye is then injected which fills the blood vessels of the heart (coronary arteries) and an x-ray picture is taken. This picture can then be studied to assess which arteries are blocked and how severe the blockages are. You cannot feel the catheter in the heart but some people experience a 'hot flush' when the dye is injected.

Interventions to treat a blockage can sometimes be performed at the same time as an angiogram. This is called Percutaneous Coronary Intervention (PCI), or angioplasty.

PCI involves widening narrowed areas of coronary arteries to improve the blood flow. It can be performed at the same time as an angiogram or as a separate procedure. PCI can be described as



'routine', 'primary' or 'rescue' depending on the situation. Often a small tube, called a stent, is placed in the artery during PCI to keep the artery open.

## **Heart Scans**

### ***Echocardiogram***

Also referred to as an 'echo' this is an ultrasound scan of the heart. Special jelly is applied to the bare chest to make good contact. An operator lays a probe on the chest and moves it around to get different views. Sound waves bounce information about the structure of the heart back to a computer to make a picture of the heart. This tells the doctor about:

- the size of the heart
- how well the muscle is working
- how well the valves are working

### ***Other kinds of echocardiograms:***

#### ***Doppler echocardiogram***

This echo scan is used to study the speed and direction of blood flow within the heart.

It is particularly useful in assessing leakage and narrowing of the heart valves, and for assessing any holes between two chambers of the heart.

#### ***Trans-oesophageal echocardiogram***

(sometimes known as TOE or TEE)

This echo scan is used to examine the heart from the oesophagus (gullet) which lies behind the heart giving a different view than from the front.

It is used when the doctor needs more specialised, detailed information e.g. about valves or infection. A small ultrasound probe is swallowed following light sedation and local anaesthetic spray to the back of the throat. This is gently pulled back up again after the test.

### ***Magnetic Resonance Imaging (MRI)***

This scan uses a magnetic field to produce detailed images of the heart and blood vessels. It is very helpful in getting information about the heart for those who cannot have an exercise ECG, or if this has been inconclusive.

An MRI usually involves lying down, on a couch, inside a large metal cylinder. The couch then moves backwards and forwards through the cylinder and images of the body are taken. You can listen to music during the scan and you will be able to hear the radiographer (the person who operates the machine) talk to you.

### ***Cardiac computed tomography (Cardiac CT)***

Cardiac CT also uses a special x-ray machine, which moves around your body, to take detailed pictures of the heart. The pictures taken can help detect heart problems.

### ***Thallium scan (Myocardial perfusion scintigraphy)***

This scan shows how well blood is reaching the heart muscle through the coronary arteries.

A small amount of thallium (a radioactive substance) is injected into a vein and a special camera moves around your body. The camera picks up traces of



thallium and produces pictures. As thallium will not travel well to areas where there is a poor blood supply the pictures can be used to see how well blood is reaching the heart.

The scan can compare how well the thallium is taken up by the heart muscle when it is made to work harder in the form of an exercise test or by an injection of a stimulant drug.

It is a useful scan when exercise tests cannot be done or when specific information on the heart muscle is needed which a treadmill exercise test cannot provide.

## GLOSSARY OF COMMONLY USED HEART TERMS

**Acute Coronary Syndrome (ACS):** the medical term used to describe conditions associated with possible or actual heart damage due to restricted blood supply to the heart muscle caused by coronary artery disease. Includes unstable angina and heart attack

**Aneurysm:** swelling in a blood vessel or muscle wall

**Angina:** chest pain caused by lack of blood flow to the heart muscle

**Angiography:** also known as cardiac catheterisation and often performed in a 'Cath lab' in the cardiology department. It is an x-ray examination of the heart which is used to assess blockages in the coronary arteries

**Aorta:** the main blood vessel which leaves the heart to supply the rest of the body with blood

**Arrhythmia:** medical term for abnormal heart rhythms

**Atrial septal defect:** a hole in the heart between the right and left atria

**Atrio-ventricular (AV) node:** area of specialised tissue between the atria and the ventricles. It conducts the electrical impulse from the atria to the ventricles

**Blood pressure:** measurement of the pressure within the arteries

**Bradycardia:** slow heart rate (less than 60 beats per minute)

**Cardiac arrest:** when the heart stops beating suddenly – a medical emergency

**Cardiac enzymes:** presence in a blood test can help to diagnose a heart attack

**Cardiologist:** a physician who specialises in heart disease

**Cardiopulmonary resuscitation (CPR):** reviving someone whose heart has stopped beating and who has stopped breathing by giving heart massage and mouth-to-mouth breathing

**Cardiovascular:** relating to the heart and blood vessels

**Cholesterol:** fatty substance that contributes to the build up of atheroma in the blood vessels

**Claudication:** pain in the legs when walking caused by lack of oxygen due to narrowed arteries

**Congenital defects:** structural problems within the heart or body that a person is born with

**Coronary:** relating to the heart's own blood supply

**Coronary Artery Bypass Graft (CABG):** commonly referred to as a 'Bypass'. Bypass surgery can be performed on more than one narrowed coronary artery hence 'double' and 'triple' bypass surgery. The surgeon literally bypasses the affected

artery by using a blood vessel taken from the leg or chest, to provide a new route for the blood supply to the heart

**Coronary Heart Disease (CHD):** narrowing of the coronary arteries by atheroma

**Deep vein thrombosis (DVT):** blood clot in a vein in the leg

**Defibrillator:** device used to deliver an electric shock to the heart to restart, or correct abnormal heart rhythms

**Diastolic blood pressure:** lower reading taken when the heart is relaxing or filling with blood between contractions

**Endocarditis:** inflammation of the lining of the heart or valves caused by infection

**Endothelium:** smooth lining of an artery

**Fibrillation:** erratic rapid rhythm of the heart chambers, atrial or ventricular. Ventricular fibrillation is a medical emergency

**Fibrinogen:** blood-thickening agent produced by the body

**Flutter:** heart arrhythmia which originates in the atria

**Heart block:** interrupted electrical pathway causing a slowing of the heart rate

**High-density lipoprotein:** (HDL) known as 'good' cholesterol, helps to remove 'bad' cholesterol (LDL) from the blood and blood vessels

**Hypertension:** high blood pressure

**Hypotension:** low blood pressure

**Infarct:** scarred or permanently damaged area of heart muscle

**Ischaemic:** damage to cells due to lack of oxygen

**Ischaemic heart disease:** heart disease caused by inadequate blood supply

**Keyhole bypass surgery:** a bypass operation that can be done without the need to open the breastbone or stop the heart

**Low-density lipoprotein:** (LDL) 'bad' cholesterol, which is involved in build up of atheroma in the blood vessels

**Murmur:** an abnormal heart sound, heard through a stethoscope

**Myocardial infarction:** another term for a heart attack

**Myocardium:** heart muscle

**Pacemaker:** small electrical device implanted surgically to regulate an abnormal rhythm (usually the heart beating too slowly) or to regulate the contraction of the heart muscle

**Percutaneous Coronary Intervention (PCI):** medical procedure which involves stretching narrowed areas of coronary arteries to improve the blood flow, also called angioplasty

**Pericardium:** smooth sac that surrounds the outside of the heart

**Pericarditis:** inflammation of the pericardium

**Platelets:** small blood cells that stick together to form clots

**Pulmonary:** relating to the lungs

**Pulmonary embolism:** a broken-off fragment of blood clot which travels in the bloodstream to the lungs

**Regurgitation:** refers to a leaking heart valve e.g. mitral regurgitation

**Reperfusion therapy:** treatment to restore the blood flow to an organ or tissue. After a heart attack an immediate goal is to quickly open blocked arteries and restore blood supply to the heart muscles. Early reperfusion minimises the extent of heart muscle damage and preserves the pumping function of the heart. This can be achieved by either PCI or thrombolysis

**Revascularisation:** involves using a procedure that either opens up the existing blood vessels or bypasses a blockage of the coronary arteries. This can be achieved by PCI or Coronary Artery Bypass Graft

**Risk factor:** a situation that leads to an increased chance of developing a disease e.g. smoking is a risk factor for coronary artery disease

**Saturated fats:** usually animal fat, solid at room temperature

**Septum:** structure that divides the right and left side of the heart. A defect or hole in the heart is called a septal defect



**Sino-atrial (SA) node:** the heart's natural pacemaker which generates the electrical signal that stimulates the heart muscle to contract and relax

**Stenosis:** refers to a narrowing

**Stethoscope:** instrument for listening to sounds within the body

**Stroke:** damage to the brain as a result of an interruption to the blood supply

**Systolic blood pressure:** higher of the two readings taken when blood pressure is measured. It is the pressure in the arteries as the heart contracts

**Tachycardia:** rapid heart beat, typically over 100 beats per minute

**Thrombolysis:** dissolving of a blood clot with 'clot-busting' drugs

**Thrombosis:** blood clot

**Troponin:** proteins released into the blood stream when heart muscle is damaged

**Tissue plasminogen activator (TPA):** a type of thrombolysis

**Ventricular septal defect:** hole between the right and left ventricle

## USEFUL ADDRESSES AND WEBSITES

### **Blood Pressure UK**

Wolfson Institute Charterhouse Square

London EC1M 6BQ

Tel: (020) 7822/5793

Website: [www.bloodpressureuk.org](http://www.bloodpressureuk.org)

*Blood Pressure UK is the UK-wide charity dedicated to lowering the nation's blood pressure. Their aim is to prevent unnecessary death and disability from heart disease, heart attacks and stroke caused by high blood pressure.*

### **The Cardiomyopathy Association**

Unit 10, Chiltern Court

Asheridge Road

Chesham

Bucks HP5 2PX

Helpline: 0800 018 1024

(Monday to Friday 8.30am - 4.30pm)

Email: [info@cardiomyopathy.org](mailto:info@cardiomyopathy.org)

Website: [www.cardiomyopathy.org](http://www.cardiomyopathy.org)

*The Cardiomyopathy Association provides information on the main forms of the heart muscle disease known as cardiomyopathy.*

## **Chest Heart & Stroke Scotland**

Rosebery House  
9 Haymarket Terrace  
Edinburgh EH1 2 5EZ

Tel: 0131 225 6963

Fax: 0131 220 6313

Advice Line: (Freephone) 0808 801 0899

(Monday to Friday 9.30am - 4pm)

E-mail: [adviceline@chss.org.uk](mailto:adviceline@chss.org.uk)

Website: [www.chss.org.uk](http://www.chss.org.uk)

*Chest Heart & Stroke Scotland improves the quality of life for people in Scotland affected by chest, heart and stroke illness, through medical research, influencing public policy, advice and information and support in the community.*

## **Diabetes UK Scotland**

The Venlaw  
349 Bath Street  
Glasgow G2 4AA

Telephone: 0141 245 6380

Fax: 0141 248 2107

Careline Scotland: 0345 123 2399

(Monday to Friday 9am - 5pm)

Email: [carelinescotland@diabetes.org.uk](mailto:carelinescotland@diabetes.org.uk)

Website: [www.diabetes.org.uk/In\\_Your\\_Area/Scotland/](http://www.diabetes.org.uk/In_Your_Area/Scotland/)

*Diabetes UK Scotland is dedicated to putting the interests of people with diabetes first, through the best in campaigning, research and care.*

## **The Somerville Foundation**

Saracen's House  
25 St Margaret's Green  
Ipswich IP4 2BN

Helpline: 0800 854759  
Email: [helpline@thesf.org.uk](mailto:helpline@thesf.org.uk)  
Website: [www.thesf.org.uk](http://www.thesf.org.uk)

*The Somerville Foundation supports young people and adults with congenital heart disease.*

## **Heart UK**

7 North Road  
Maidenhead SL6 1PE

Cholesterol Helpline: 0845 450 5988  
(Monday - Friday from 10am to 3pm - Advice in Punjabi Urdu and Hindi available on Fridays.)  
Email: [ask@heartuk.org.uk](mailto:ask@heartuk.org.uk)  
Website: [www.heartuk.org.uk](http://www.heartuk.org.uk)

*Heart UK are committed to raising awareness about the risks of high cholesterol, lobby for better detection of those at risk, fund research into improved treatment and support health professional training. They work with a variety of partners to promote healthier lifestyle options.*

## **NHS 24**

Telephone free on: 111

Website: [nhs24.com](https://www.nhs.uk/24)

*This phone service is designed to help you get the right help from the right people at the right time and GP out of hours advice.*

*The website provides comprehensive up-to-date health information and self-care advice for people in Scotland.*

**Do you have any  
questions about chest,  
heart or stroke illness?**



**Ask the nurse  
0808 801 0899**

Call **FREE** from landlines and mobiles  **Helplines  
STANDARD**

**[www.chss.org.uk](http://www.chss.org.uk)**

## HEART PUBLICATIONS

Booklets	
<b>H1</b>	Living with Angina
<b>H2</b>	Reducing the Risk of Heart Disease
<b>H3</b>	Understanding Heart Disease
<b>H4</b>	Living with High Blood Pressure
<b>H5</b>	Living with Heart Failure
<b>H6</b>	Living with a Pacemaker
<b>H7</b>	Heart Attack: A Guide to your Recovery
<b>H8</b>	Understanding Heart Valve Problems
<b>H9</b>	Understanding Atrial Fibrillation
<b>H10</b>	Living with an ICD

DVDs	
<b>H5D</b>	Living with Heart Failure DVD: £5.00
<b>H7V</b>	Heart Attack: A guide DVD: £5.00

Factsheets – Free	
<b>F1</b>	Smoking
<b>F2</b>	Salt
<b>F3</b>	Cholesterol
<b>F4</b>	Warfarin
<b>F6</b>	Holiday information
<b>F7</b>	Travel and motor insurance
<b>F13</b>	Air travel
<b>F17</b>	Diabetes: links with heart disease and stroke
<b>F18</b>	Coping with tiredness and fatigue
<b>F20</b>	Illustrated risk factors (ethnic target)
<b>F21</b>	Illustrated risk factors (general target)
<b>F22</b>	How to make the most of a visit to your doctor
<b>F23</b>	Living with stress and anxiety
<b>F24</b>	Healthy eating
<b>F26</b>	Understanding help in the community
<b>F30</b>	Just move!
<b>F37</b>	Coping with low mood/depression
<b>F39</b>	Understanding the need for change after a heart attack
<b>F40</b>	Losing weight
<b>F41</b>	Financial support for people affected by chest heart or stroke illness

A full publication list is available from Head Office.  
Rosebery House, 9 Haymarket Terrace, Edinburgh EH1 2 5EZ Tel: 0131 225 6963

### ORDER FORM

Please send me the following:

TITLE	No. of copies

**Up to 100 booklets free, up to 100 factsheets free**

If you wish to order more than 100 booklets or factsheets please contact the Health Information department at the address above.

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Postcode: \_\_\_\_\_

Tel: \_\_\_\_\_ Email: \_\_\_\_\_

**Chest Heart & Stroke Scotland is a wholly independent Scottish charity. We receive no core funding from Government or any public body or private agency.**

**We need your help to achieve our aim of improving the lives of those in Scotland with chest, heart and stroke illness. See insert for more information.**

## CONTACT US

### Head Office

Chest Heart & Stroke Scotland  
Rosebery House  
9 Haymarket Terrace  
Edinburgh EH12 5EZ  
Tel: 0131 225 6963  
Fax: 0131 220 6313  
Open Mon – Fri

### West Office:

Chest Heart & Stroke Scotland  
West of Scotland Regional Office  
The Hub, 70 Pacific Quay  
Glasgow G51 1DZ  
Tel: 0300 1212 111  
Email: [westoffice@chss.org.uk](mailto:westoffice@chss.org.uk)  
Open Mon – Fri

### North Office:

Chest Heart & Stroke Scotland  
North of Scotland Regional Office  
5 Mealmarket Close  
Inverness IV1 1HT  
Tel: 0300 1212 777  
Email: [northoffice@chss.org.uk](mailto:northoffice@chss.org.uk)  
Open Mon – Fri

**[www.chss.org.uk](http://www.chss.org.uk)**



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**June 2014**