SIGN
Scottish Intercollegiate Guidelines Network
Part of NHS Quality Improvement Scotland

NHS
Quality Improvement Scotland

for patients

acute coronary syndromes

If you have angina and have already been prescribed medication for this and you start to feel symptoms you should:

- take your first dose when the symptoms start
- take a second dose 5 minutes later if you feel you need it
- take a third dose after another 5 minutes if you feel you need it

If your symptoms have not settled after the third dose, you should call **999** (or **112** from a mobile phone) for emergency help.

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what is this booklet about?

This booklet is about acute coronary syndromes (ACS). It is based on the recommendations from a national clinical guideline on how to look after patients with ACS. It tells you about the tests and treatment that you may receive. Your family and friends may also find this booklet helpful.

The booklet covers:

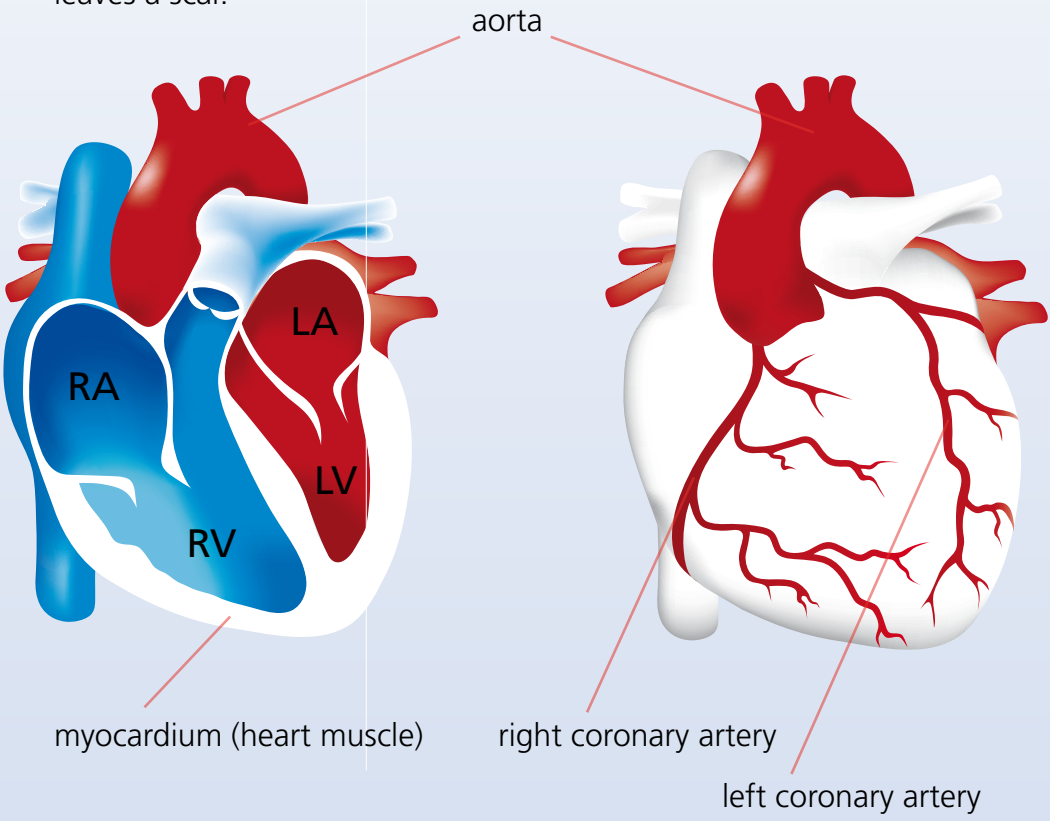
- assessment and diagnosis;
- treatment during the first 12 hours; and
- treatment after 12 hours of symptom onset.

We have listed a number of support organisations at the end of the booklet where you can get more information.

There is an explanation of all the medical terms we have used on page 24.

what are acute coronary syndromes?

"Acute coronary syndrome" (ACS) is a term that doctors use to describe a range of problems that can be caused by a sudden reduction in blood flow to the heart muscle caused by a narrowing or blockage of the blood vessels. This group of problems ranges from a threatened heart attack (**unstable angina**) to an actual heart attack (**myocardial infarction**). When a heart attack occurs, blockage of blood flow to the heart causes damage to the heart muscle and leaves a scar.



RA: right atrium
RV: right ventricle
LA: left atrium
LV: left ventricle

tests

What tests will I have?

If the doctors suspect you have ACS, you should receive a clinical assessment immediately. The doctors will consider:

- your symptoms;
- if you, or someone in your family, have a history of heart disease;
- your age and sex;
- whether or not you are a smoker;
- your weight;
- your blood pressure; and
- your cholesterol level.

> ***Patients feel it is important to receive early diagnosis and treatment***

As part of your assessment you should also receive some tests to help the doctors find out if you are having a heart attack:

- **Electrocardiogram** (ECG) – this is a test which records the rhythm and electrical activity of your heart by putting electrodes on your body and connecting these to a recording machine. The machine records the pattern of activity of your heart. Particular patterns are associated with ACS.
- **Troponin blood test** – your doctor should take blood from you within 12 hours from the start of your symptoms to check your blood troponin concentration. Troponin is a protein found in heart muscle cells. It leaks into your blood when heart muscle is damaged. This happens if you have had a heart attack.

treatment within the first 12 hours

Where should I be treated?

You may be cared for in a specialist cardiology unit by doctors and nurses who have specialised in treating heart conditions.

> ***Patients identified a need for open communication from doctors, particularly in response to questions from patients and their families.***

What treatments should I receive straight away?

Within 12 hours of your first symptoms, you may be given some of the treatments listed below:

Medicines and procedures recommended early in an ACS

Blood thinning treatment

Aspirin therapy

You should be given **aspirin** immediately. Aspirin will help prevent your blood from clotting.

Combination aspirin and clopidogrel therapy

You should be treated immediately with both aspirin and a drug called **clopidogrel** if:

- there is a change in your cardiac rhythm; or
- your troponin level is raised.

Glycoprotein IIb/IIa receptor antagonist

If the doctors think that you have a high risk of having a heart attack, you should be given a drug called **glycoprotein IIb/IIa receptor antagonist**. This will be given to you as a drip, directly into your veins. This drug is also used if you are going to have a procedure called **percutaneous coronary intervention** (PCI), which helps to widen your arteries.

Anticoagulant therapy

Anticoagulants are another kind of drug that help to reduce the risk of blood clots forming. If you have changes in heart rhythm, you should be treated with either:

- **low molecular weight heparin**; or
- **fondaparinux.**

You should take these drugs for eight days or until you leave hospital or have a procedure called **coronary revascularisation**.

Beta blockers

Beta blockers will help to stop you having either another attack of angina or a heart attack. They can also reduce your risk of dying.

You should not be treated with beta blockers if you have:

- low blood pressure; or
- a slow heart rate.

Cardiac monitoring

Your heart rhythm should be monitored so that doctors can see if there are any other problems with how your heart is beating. This is called **continuous cardiac rhythm monitoring**.

Insulin

Your blood sugar levels will be controlled with insulin and monitored for at least 24 hours if:

- you have diabetes and have had a heart attack; or
- you have increased levels of sugar in your blood.

This is called **glycaemic control**.

Primary percutaneous intervention (PCI)

You may have a procedure called PCI to widen your narrowed artery. In this procedure a **catheter** (a thin hollow tube) with a small inflatable balloon at its tip is passed into an artery in either your groin or your arm. The operator uses x-rays to direct the catheter to a coronary artery until its tip reaches the narrowed or blocked section. The balloon is then gently inflated so that it squashes the fatty tissue responsible for the narrowing. This widens the artery so blood can flow more easily. Inside the catheter there is a short tube of stainless steel mesh, called a **stent**, which is left in place to hold open the narrowed blood vessel.

When you have this procedure you should also be treated with a **glycoprotein IIb/IIIa receptor antagonist**. This can help relieve your pain and reduce the chances of blood clots completely blocking your arteries.

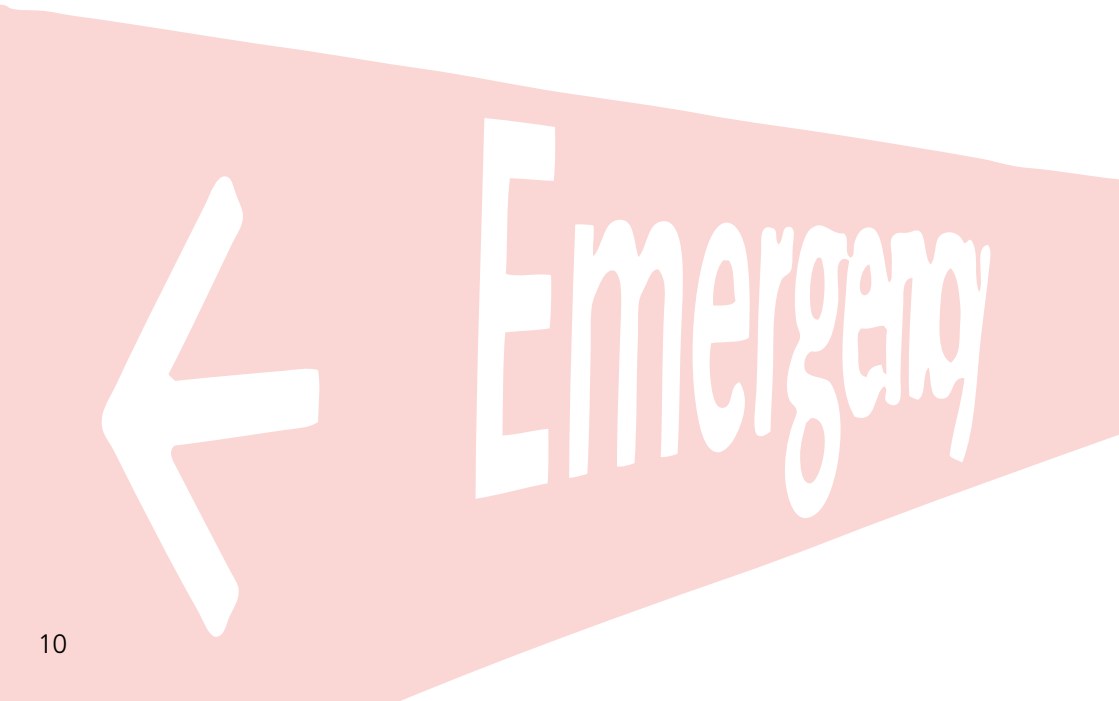
Thrombolytic drugs (clotbusters)

If it is not possible to offer you PCI within 90 minutes of making your diagnosis, you should receive immediate thrombolytic drugs. This is a treatment which helps to dissolve any blood clots that may be blocking your arteries.

Side effects of thrombolytic drugs can include nausea, sickness and bleeding. Bleeding is usually limited to the site of injection but bleeding from other areas of your body may occur.

Rescue PCI

If thrombolytic drugs have not helped you within six hours your doctor may suggest PCI (percutaneous coronary intervention). This is known as rescue PCI.



treatment beyond the first 12 hours

Once the first 12 hours have passed what other treatments will I need?

Revascularisation

Revascularisation is the term for a range of procedures that are used to unblock narrowed arteries. If doctors think that you have a strong chance of having angina or a heart attack again, then you should have **coronary angiography** and revascularisation.

Coronary angiography is a procedure where a catheter (small hollow tube) is inserted into your groin or arm and directed through your blood vessels. A dye is then put down the catheter into the blocked arteries and an x-ray is taken to give the doctors pictures showing where your blood vessels are narrow.

Revascularisation is the term for a range of procedures that are used to unblock narrowed arteries.

If you have been treated with thrombolytic drugs, you should be considered for early angiography and revascularisation.

Drug treatments

Medicines you may need to take in the long term

Angiotensin converting enzyme inhibitors (ACE inhibitors)

You should be started on long term ACE inhibitor therapy within 36 hours of the attack if you have:

- had a heart attack;
- unstable angina; or
- damaged heart muscle.

ACE inhibitors help to lower your blood pressure and to reduce the work your heart has to do to pump blood around your body.

You may experience some side effects from your ACE inhibitor, and your doctor should discuss these with you.

Angiotensin receptor blockers (ARB)

Angiotensin receptor blockers have the same effect as ACE inhibitors.

You will be given an ARB instead of an ACE inhibitor if you:

- are unable to take an ACE inhibitor; or
- have had a heart attack that was caused by the left side of your heart not working properly.

Antiplatelet or aspirin therapy

You should continue to take aspirin. This is called long term aspirin therapy. A dose of 75-150 mg is recommended.

Beta blockers and anti-anginal therapy

If you have unstable angina or signs of damage to your heart muscle or if you have had a heart attack, you should be given long term beta blocker therapy.

If you continue to have symptoms of angina or have signs of heart failure then you should be given drugs called **nitrates** to relieve your pain.

Clopidogrel

Depending on the type of ACS you have, you should take clopidogrel for four weeks to three months. Your doctor will tell you when to stop taking this.

Eplereone

Eplereone belongs to a class of drugs called aldosterone receptor antagonists.

You should receive eplereone if you have had a heart attack and have diabetes or signs of heart failure. Your doctor should not give you this if you have kidney problems (**renal impairment**) or high levels of potassium in your blood.

Statins

A statin is a drug that helps to lower your cholesterol levels.

You should be started on a long term statin before you are discharged from hospital.

complications

How will complications be treated?

Breathing difficulties

Sometimes patients with ACS develop a collection of fluid in their lungs. This is called **pulmonary oedema**. This may leave you with shortness of breath and doctors should discuss with you whether or not you might need to have assisted ventilation. This is when a mask is placed over your nose and mouth so that you can be given oxygen to make your breathing easier.

Low blood pressure/damaged heart muscle

Sometimes patients with ACS experience a sudden drop in blood pressure (**hypotension**) and blood flow around their body. If this happens your heart is said to be in **cardiogenic shock**.

The treatment for this is called intravascular volume loading and inotropic therapy. This means that the doctors will use a drip to give you special fluids (called **inotropic fluid**) to increase the volume of fluid that is circulating around your body.

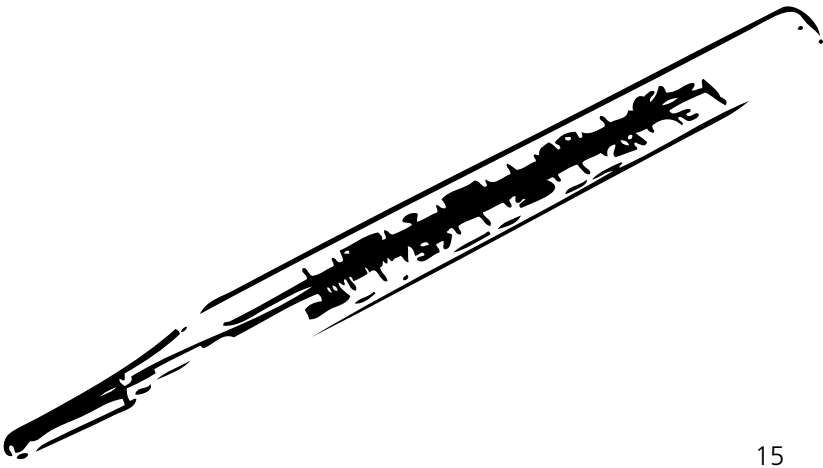
Your doctors may consider using a technique called **intra-aortic balloon pump counterpulsation** if your ACS is complicated by:

- cardiogenic shock;
- ruptured heart muscle; or
- persistent pain.

Intra-aortic balloon pump counterpulsation is used to increase blood flow to your heart muscle and to reduce the workload for your heart. The pump will be placed inside your aorta, which is the main artery that carries oxygen-rich blood to the rest of the body (see diagram on page 3).

If you have low blood pressure due to the left side of your heart failing, you should be considered for immediate coronary revascularisation (see page 11).

If you have suffered severe damage to your heart muscle, then you may have a physical problem such as a ruptured muscle which is preventing your heart from working. If this is the case then you should be considered for surgery to put this right within 24-48 hours of your heart attack.



coping with ACS

How will ACS affect my mental health?

Often patients who have ACS have many misunderstandings about their cardiac illness. It is quite normal to experience emotions such as fear, anger and anxiety.

You should be offered early psychosocial assessment and treatment as part of your rehabilitation. This can help you understand and cope with your condition. You can read more about cardiac rehabilitation in the SIGN guideline on cardiac rehabilitation **www.sign.ac.uk** or request a hard copy by phoning 0131 718 5090.

Patients feel it is important for doctors to discuss the psychological aspects of cardiac rehabilitation and help patients appreciate the value of it. This is important for recovery of confidence, psychological and physical well-being.

information and support

Will I receive information and support?

Your doctor or practice nurse should give you information on support groups and refer you to your nearest group if you feel this would be useful. There are cardiac support groups across Scotland supported by Chest Heart and Stroke Scotland (CHSS). These self help groups are run by lay people with experience of heart disease. You and your family may find it helpful to meet and talk to people who have gone through similar experiences. You can refer yourself to one of these support groups if your healthcare team hasn't already done so (details of CHSS are listed on page 20). Support groups can give you and your family/friends:

- emotional and social support;
- rehabilitation (through a structured exercise programme);
- advice on preventing further heart problems; and
- information and education.

Where can I find out more?

Action on Smoking and Health (ASH)
8 Frederick Street
Edinburgh
EH2 2HB
Phone: 0131 225 4725 • Fax: 0131 225 4759
Email: ashscotland@ashscotland.org.uk • **www.ash.org.uk**

ASH Scotland is a voluntary organisation providing expert information and advice on all aspects of tobacco. Provides a range of written information including advice on passive smoking, smoking and young people, smoking cessation and smoking policies in the workplace.

Blood Pressure Association
60 Cranmer Terrace
London
SW17 0QS
Phone: 020 8772 4994 (Best time to telephone: 9.30am - 5.30pm, Monday to Friday) • Fax: 020 8772 4999
Email Information Service: www.bpassoc.org.uk/mailform.htm
www.bpassoc.org.uk

The Blood Pressure Association (BPA) helps people with high blood pressure to become more involved in controlling their condition. Provides a range of information including management of hypertension, medications, lifestyle changes and other risk factors.

British Cardiac Patients Association
BCPA Head Office
2 Station Road
Swavesey
Cambridge
CB4 5QJ
Phone: 0800 479 2800 • Fax: 01954 202 022
Email: enquiries@bcpa.co.uk • **www.bcpa.co.uk**

The British Cardiac Patients Association is a charitable organisation run by volunteers providing support, advice and information to cardiac patients and their carers.

British Heart Foundation (Scotland)
4 Shore Place
Edinburgh
EH6 6WW
Phone: 0131 555 5891 • Email: scotland@bhf.org.uk
Heart Information line: 08450 70 80 70 (available Mon-Fri 9am-5pm)
www.bhf.org.uk

The British Heart Foundation provides a free telephone information service for those seeking information on heart health issues. Also provides a range of written materials offering advice and information to CHD patients and carers. Topics include physical activity, smoking and diabetes.

Chest Heart and Stroke Scotland
65 North Castle Street
Edinburgh
EH2 3LT
Phone: 0131 225 6963 • Freephone helpline: 0845 0776000
Email: admin@chss.org.uk • **www.chss.org.uk**

Chest Heart and Stroke Scotland provides a 24 hour advice line offering confidential, independent advice on all aspects of chest, heart and stroke illness. A series of information booklets, factsheets and videos are available free of charge to patients and carers. There are over 30 cardiac support groups in Scotland which are affiliated to CHSS, patients can contact CHSS for details of their nearest local support group.

Depression Alliance Scotland
3 Grosvenor Gardens
Edinburgh
EH12 5JU
Phone: 0131 467 3050 • E-mail: info@dascot.org
www.depressionalliance.org

Depression Alliance Scotland provides information and support for people in Scotland who have depression.

Diabetes UK
10 Parkway
London
NW1 7AA
Phone: 020 7424 1000 • Careline: 0845 120 2960 (Best time to telephone: 9.30am - 5.30pm, Monday to Friday)
Email: careline@diabetes.org.uk • **www.diabetes.org.uk**

Diabetes UK is a national organisation providing information and advice on all aspects of diabetes such as diabetic care and diet. Provides a series of information leaflets including Diabetes UK's own magazine Balance.

Heart Surgery in Great Britain
http://heartsurgery.healthcarecommission.org.uk/

This website has been developed by the Healthcare commission and the Society for Cardiothoracic Surgery in Great Britain and Ireland to help heart surgery patients make informed choices about their treatment. It provides patients and carers with information on the different operations available and the benefits of having heart surgery.

Heart UK
7 North Road
Maidenhead
Berkshire
SL6 1PE
Phone: 01628 628 638 (Best time to telephone: 9.30am - 4pm, Monday to Friday) • Fax: 01628 628 698
Email: ask@heartuk.org.uk • **www.heartuk.org.uk**

Heart UK is a national charity aiming to offer information and support to anyone at high risk of CHD, particularly families with inherited high cholesterol. Provides a range of information including management of CHD by lifestyle, drugs and diet.

High Blood Pressure Foundation
Department of Medical Sciences
Western General Hospital
Edinburgh
EH4 2XU
Phone: 0131 332 9211 (Best time to telephone: 9.30am - 5pm, Monday to Friday) • Fax: 0131 332 9211 • Email: hbpf@hbpf.org.uk
www.hbpf.org.uk

The High Blood Pressure Foundation is a registered charity which aims to improve the assessment, treatment and public awareness of high blood pressure. Provides a range of information leaflets including understanding high blood pressure and cholesterol and cardiovascular risk.

Mental Health Foundation (Scotland)
Merchant's House
30 George Square
Glasgow, G2 1EG
Phone: 0141 572 0125 • Email: Scotland@mhf.org.uk
www.mentalhealth.org.uk

The Mental Health Foundation helps people prevent, cope with and recover from mental health problems. Provides a range of factsheets on mental health issues including anxiety and depression.

NHS Health Scotland
Woodburn House,
Canaan Lane,
Edinburgh,
EH10 4SG
Phone: 0131 536 5500 • Textphone: 0131 535 5503
Fax: 0131 535 5501
Email: publications@health.scot.org.uk (information on obtaining Health Scotland publications); library.enquiries@health.scot.nhs.uk (help with general health information enquiries)
www.hebs.com

NHS Health Scotland is a special health board within NHS Scotland. The organisation provides information on projects, publications, support groups and information leaflets relating to CHD.

NHS 24
Phone: 0845 4 24 24 24
www.nhs24.com

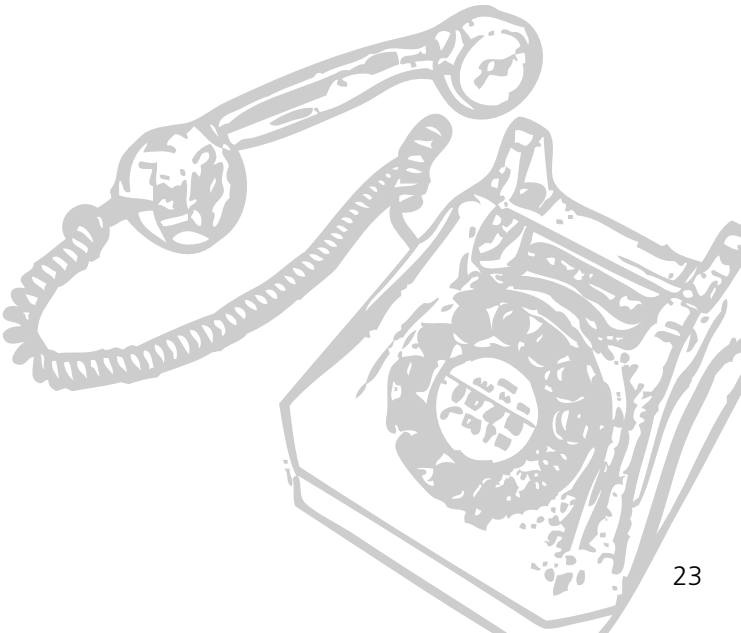
NHS 24 is a nurse led service for members of the public. It is a free helpline offering health information, advice and help over the phone.

Scotland's Health on the Web
www.show.scot.nhs.uk

This website provides public access to publications relating to CHD such as the strategy for CHD and stroke in Scotland.

Scottish Association for Mental Health (SAMH)
Cumbrae House
15 Carlton Court
Glasgow
G5 9JP
Phone: 0141 568 7000 (Best time to telephone: 2pm-4.30pm, Monday to Friday) • Email: enquire@samh.org.uk
www.samh.org.uk

Provides patients and carers with information on all aspects of mental health.



glossary

Acute coronary syndromes a pattern of symptoms of chest pain including unstable angina and heart attack

Angina chest discomfort brought on by activities such as exercise and emotional stress

Angiotensin converting enzyme inhibitor (ACE inhibitor) a drug used to lower blood pressure

Angiotensin receptor blocker (ARB) a drug used to lower blood pressure

Aspirin a drug which is used to help prevent blood clots

Beta blocker a drug which blocks the action of hormones called noradrenaline and adrenaline, which normally increase your heart rate (make your heart beat faster). Using beta blockers slows down your heart rate and lowers your blood pressure

Calcium channel blocker a drug that is used to treat angina and high blood pressure

Cardiac rhythm monitoring monitoring of the heart rhythm using an ECG

Cardiogenic shock sudden drop in blood pressure and blood flow to the body

Cardiologist a doctor specialising in heart disease

Clopidogrel a drug used to treat acute coronary syndrome

Coronary angiography a procedure where a catheter is inserted into your groin or arm and directed through your blood vessels. A dye is then put down the catheter into the blocked arteries and an x-ray is taken to give the doctors pictures showing where your blood vessels are narrow

Coronary artery bypass grafting (CABG) an operation to bypass a narrowed section or sections of coronary arteries and improve the blood supply to the heart

Coronary revascularisation a procedure that restores blood flow to a part of the body

Electrocardiogram (ECG) a test which records the rhythm and electrical activity of your heart by putting electrodes on your body and connecting these to a recording machine

Eplereone a drug given to people who have had a heart attack and have diabetes or have signs of heart failure

Glycoprotein IIb/IIa receptor antagonist a drug used to prevent blood clots from forming

High blood pressure occurs when the smaller blood vessels in the body become narrow and cause pressure to build up. Also known as hypertension

Hypertension high blood pressure

Inotropic therapy special fluids (called inotropic fluid) given to increase the volume of fluid that is circulating around your body

Myocardial infarction heart attack

Nitrates drugs used to relieve angina

Percutaneous intervention (PCI) an operation to widen your narrowed artery using a catheter (thin hollow tube) with an inflatable balloon. Your doctor will insert the catheter into an artery at your groin or arm and directs the catheter to the narrowed section. The balloon is inflated to remove the fatty tissue which is causing the narrowing. The doctor will use the tube of steel mesh from the catheter to keep the widened artery open. This is known as a stent

Peripheral arterial disease a disease of the arteries which supply blood to the limbs

Pulmonary oedema a collection of fluid in the lungs

Revascularisation any procedure that restores blood flow to a part of the body

Statin therapy drugs used to reduce cholesterol levels (a fatty material made in the body by the liver)

Troponin a protein found in heart muscle cells. It leaks into the blood when the heart muscle is damaged

Unstable angina is angina which you have experienced for the first time or angina which has previously been stable but has worsened. Unstable angina can occur during periods of rest or with minimal activity

References:

British Heart Foundation (BHF). The heart – technical terms explained: Heart Information Series Number 18; BHF; London; 2004.

notes

notes

What is SIGN?

The Scottish Intercollegiate Guidelines Network (SIGN) writes guidelines which give advice to doctors, nurses, physiotherapists, occupational therapists, other healthcare staff and patients about the best treatments that are available. We write them by working with doctors, nurses and other NHS staff and with patients, carers and members of the public. The guidelines are based on the most up to date medical evidence.

Alternative formats

If you would like a copy of this booklet in an alternative language or format such as large print, please contact

Karen Graham
Patient Involvement Co-ordinator
Phone: 0131 623 4740 • Email: karen.graham2@nhs.net

This booklet is based on a clinical guideline issued to all NHS staff.

The 2007 guideline was developed by SIGN, the Scottish Intercollegiate Guidelines Network. It is based on the most up to date medical evidence.

The full clinical guideline can be downloaded from the SIGN website www.sign.ac.uk

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