Healthcare Improvement Scotland

Acute coronary syndrome

Immediate assessment, diagnosis and treatment

A booklet for patients, their families and carers

SIGN
Scottish guidelines

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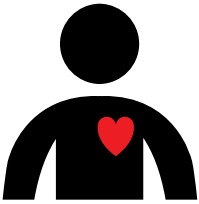
Contents

Who is this booklet for?

This booklet is for you if:



You have been admitted to hospital with a suspected heart attack or unstable angina.

Or

You are a family member or carer of someone who has a suspected heart attack or unstable angina on admission to hospital.

The booklet covers:

- assessment and investigation (see page 5)
- treatments during the first 12 hours (see page 10), and
- continuing investigation and treatment (see page 13).

What is this booklet about?

This booklet explains the recommendations in a clinical guideline produced by the Scottish Intercollegiate Guidelines Network (SIGN). The guideline is about patients who are assessed and treated for acute coronary syndrome (heart attack or unstable angina).

It gives you information about the care you are likely to get but it does not give a lot of information on acute coronary syndrome.

On pages 24 to 27 there are details of organisations who can give you information about acute coronary syndrome (heart attack and unstable angina).

The clinical guideline is based on what we know from current medical research. It also gives advice based on the opinion of healthcare professionals who are trained on how best to manage your care. On page 28 you can find more about us at SIGN and how we produce our guidelines.

There are four types of recommendations in this booklet.

Strong recommendation based on the research evidence.

Recommendation based on the research evidence.

Recommendation based on clinical experience.

Not enough research evidence to tell us if something is of benefit.

If you would like to see the clinical guideline, please visit **www.sign.ac.uk**

What is acute coronary syndrome?

Acute coronary syndrome (ACS) describes a group of problems that can be caused by a sudden reduction in blood flow to the heart muscle. This happens because of narrowing or blockage of one of the arteries (blood vessels) around the heart. The problems include unstable angina (chest pain where there is no permanent damage to the heart muscle) and heart attack (myocardial infarction).

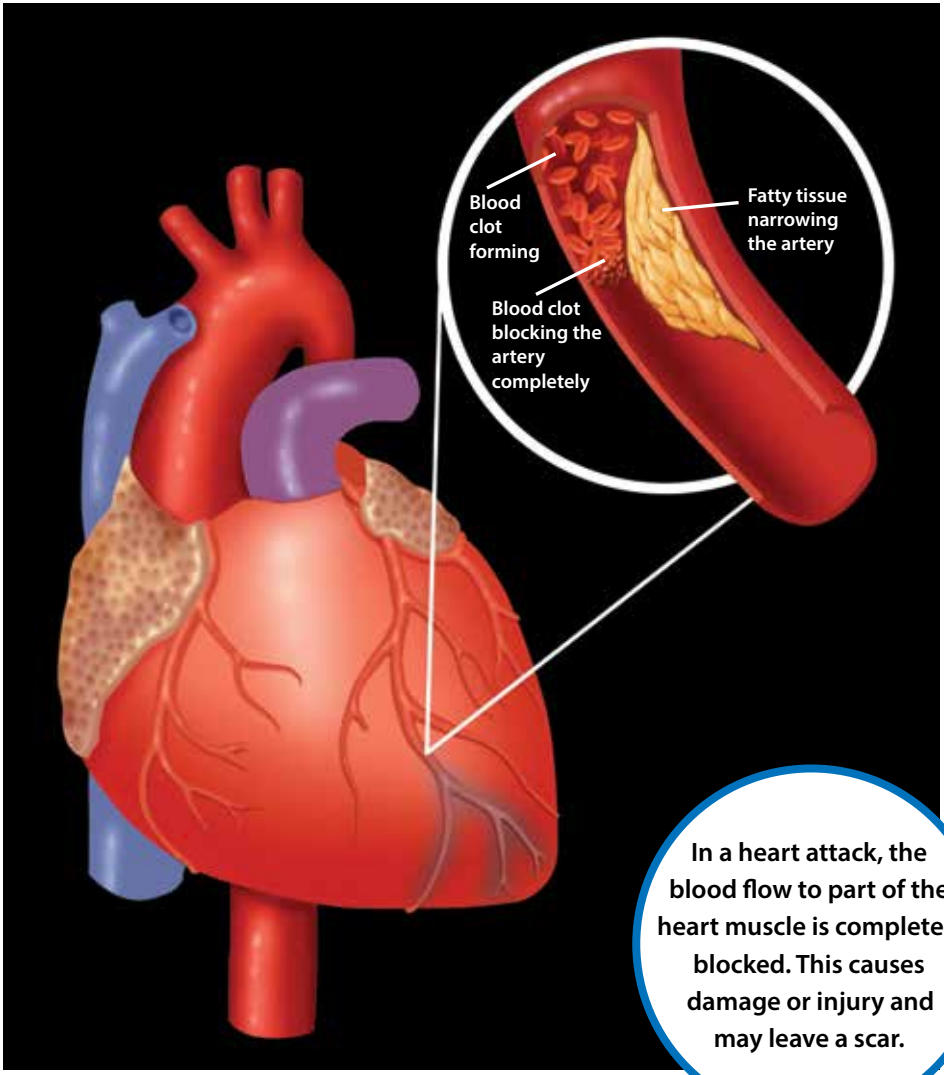
Usually, a heart attack starts with chest pain or discomfort.

If you have angina for which you have already been prescribed glyceryl trinitrate (GTN) medication and you start to feel symptoms, you should:

- stop what you are doing, sit down and rest
- take your GTN spray or tablets. The pain should ease within a few minutes – if it doesn't, take a second dose
- call 999 immediately (or 112 from a mobile phone) if the pain doesn't ease within a few minutes after a second dose.

Diagram of the heart

Diagram of the heart showing a blocked coronary artery



In a heart attack, the blood flow to part of the heart muscle is completely blocked. This causes damage or injury and may leave a scar.

MONICA SCHROEDER / SCIENCE SOURCE/SCIENCE PHOTO LIBRARY

How will healthcare professionals know if I have had a heart attack?

The paramedic will probably be the first person to respond to your 999 call and will ask about your symptoms. They will ask you to describe the pain and discomfort you feel. This gives them a good idea whether or not you have had a heart attack. Later, you will be asked similar questions in hospital by the nurse or doctor.

Assessment and investigation

Strong recommendation

You should be given an **electrocardiogram** (ECG) as soon as possible. This may be given first by the ambulance service. Paramedics may also ask for your medical history and your symptoms, and will record your blood pressure. Paramedics may give you some medications before taking you to hospital.

ECG is a painless test that records your heart's rhythm and electrical activity. Electrodes are placed on your body and connected to a recording machine. The machine records your heart's pattern of activity. Particular patterns are associated with acute coronary syndrome.

"Patients need to feel secure and confident that they are in safe hands."
Patient

Troponin is a protein found in heart muscle cells. It leaks into your blood when the heart is damaged, which happens after a heart attack.

Strong recommendation

When you arrive at hospital you will be seen straight away by a doctor or nurse, who will take blood for a **troponin** test. This will help them decide how you should be treated. You will have another troponin test a few hours later to help diagnose your heart problem.

Strong recommendation

Different levels (cut-off points) of troponin should be used to diagnose a heart attack in men and women.

You may also be asked:

- if you, or someone in your family, have a history of heart disease
- your age, and
- whether or not you are a smoker.

This information can help to identify whether or not you are at risk of heart disease.

Early treatment

Will healthcare professionals be able to fix my blocked coronary artery straight away?

Strong recommendation

If you have a heart attack, you may need to receive treatment as soon as possible to open your blocked artery. You will either receive **primary angioplasty** (also known as primary percutaneous coronary intervention (PCI), or **thrombolysis** unless this is not suitable for you because of other health conditions.

See pages 8 and 9 for more about these treatments.

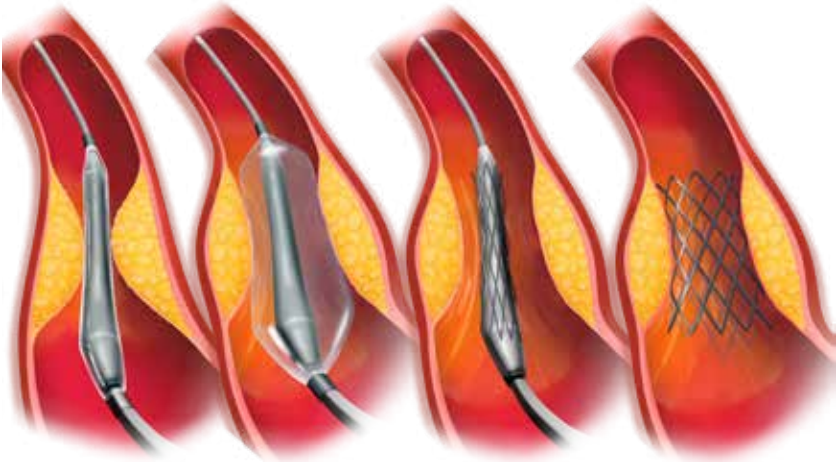
"It's a shock. When I was getting my angioplasty I thought I'm lucky to be here. I had so many questions and I thought I need to ask." ***Patient***

Primary angioplasty

Strong recommendation

When you get to hospital, you may be taken straight to the cardiac catheter lab (cath lab) where you will have primary angioplasty. This may not be available at your local hospital so the ambulance service may take you to a hospital out of your area.

In this procedure a catheter (a thin hollow tube) is passed into your artery (blood vessel), usually through your arm. Wires and balloons are passed through the catheter to repair your blocked artery.



A wire and balloon are passed into the coronary artery until they reach the narrowed section.	The balloon is inflated to squash the blood clot and fatty tissue that have caused the narrowing. This helps the blood to flow more easily.	A short tube of stainless steel mesh, called a stent, is then expanded at the site of the damage using another balloon.	The balloon and wire are removed. The stent is left in place to hold the artery open.

Thrombolysis

Strong recommendation

If it is not possible for you to receive primary angioplasty within 120 minutes of your diagnosis, you should receive immediate **thrombolytic (clot-busting) medicine**. This emergency treatment helps to dissolve any blood clots that may be blocking your arteries. It may be given by a paramedic before or during your transfer to hospital.

Recommendation

If you have been treated with thrombolytic medicine, you should be considered for early angiography and revascularisation. Revascularisation describes a range of procedures to unblock narrowed arteries.

Side effects of **thrombolytic medicine** can include nausea, sickness and bleeding. A low risk of stroke is associated with thrombolytic medicine.

Management in the first 12 hours

Where should I be treated?

Strong recommendation

If possible, you should be cared for in a specialist cardiology unit by doctors and nurses who have specialised in treating heart conditions.

"Patients want a jargon-free explanation of what has happened to them and what will happen next." ***Patient***

Strong recommendation

Cardiac monitoring

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

Not enough research evidence

There is not enough evidence to show whether **oxygen therapy** is of benefit.

Oxygen therapy is when you breathe in gas through a mask or tube under your nose (nasal cannula) that contains more oxygen than you would get from the air.

What other treatments may I receive straight away?

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

Medicine	
Aspirin (antiplatelet therapy) 	Aspirin may be given by the ambulance service or you may have been advised to take an aspirin by ambulance control before the ambulance collected you. Aspirin will help prevent your blood clotting by reducing the stickiness of platelets.
Combination aspirin and a second antiplatelet medicine 	You should be treated immediately with both aspirin and a second antiplatelet medicine if: • your electrocardiogram (ECG) result is abnormal, or • your troponin level is raised. You may be given one of three antiplatelet medicines called ticagrelor or prasugrel or clopidogrel. Which one is chosen by your doctor depends on whether you have had angioplasty (see page 7) after coming in to hospital and your risk of bleeding. Combination treatment is more effective than having just one type of antiplatelet medicine.
Anticoagulant therapy 	Anticoagulants are another kind of medicine that help to reduce the risk of blood clots forming. Whether you are given them will depend on whether you have had angioplasty and when you were admitted to hospital. You should be treated with either: • low molecular weight heparin, or • fondaparinux.

Medicine	
Beta blockers 	These work by slowing your heart rate. They reduce the risk of having another heart attack. You may receive a beta blocker unless you have: • signs of heart failure, • a slow heart rate, or • low blood pressure.
Insulin 	If you have a raised blood sugar level, and have had a heart attack, you will receive insulin to control it and be monitored for at least 24 hours, whether you have diabetes or not. This is called glycaemic control.

Strong recommendation

Glycoprotein IIb/IIIa receptor antagonists are another antiplatelet medicine that works slightly differently from the others.

Not all patients receive this medicine as it is not used routinely. The doctor looking after you will decide if it is needed as part of your treatment.

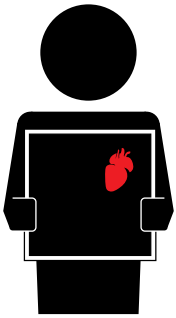
Your doctor should consider using this medicine at the time of angioplasty (see page 8).

Recommendation

If thrombolytic medicine (see page 9) has not helped you within six hours, your doctor may suggest PCI (percutaneous coronary intervention) (see page 8). This procedure is known as **rescue PCI**.

Continuing investigation and treatment

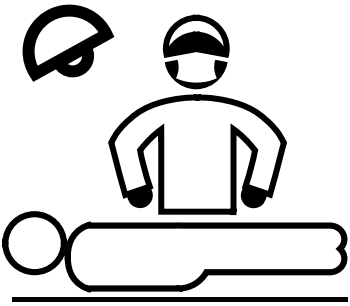
What happens after the first 12 hours?



Coronary angiography

If you have been diagnosed with unstable angina, you may have a procedure known as coronary angiography. In this procedure a catheter (small hollow tube) is inserted in your arm or groin 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 get pictures of your blood vessels. If the doctors see a very narrowed artery, you may need angioplasty (see page 8) or bypass graft surgery (see page 14).

Coronary artery bypass graft is a procedure to divert blood around narrowed parts of the major arteries. This improves blood flow and oxygen supply to your heart



You may need to have a **coronary artery bypass graft** operation depending on:

- which artery is narrowed
- how many arteries are narrowed, and
- how severe the narrowing is.

Exercise stress test

During your admission you may have an **exercise stress test** (using a treadmill or putting your heart under stress using another medication). This helps healthcare professionals to find out how well your heart works during physical activity and whether the heart muscle is getting enough blood. You may have this test if you did not have angiography (see page 13) when you came in to hospital.

Medicines you may need to take in the long term

Medicine	
Aspirin (antiplatelet therapy) 	You should continue to take aspirin. This can prevent blood clots forming and also reduces your chance of another heart attack. It's called long-term aspirin therapy. One pill, containing 75 mg, each day is recommended.
Additional antiplatelet therapy  	This can prevent blood clots forming and also reduces your chance of another heart attack. You take these medicines along with the aspirin. If you are taking ticagrelor, you take two of these pills each day. Each contains 90 mg of ticagrelor. If you are taking prasugrel, you take one pill containing 10 mg each day. If you are taking clopidogrel, you take one pill containing 75 mg each day. Most patients should take this additional antiplatelet therapy for at least six months, but your doctor will discuss with you how long you should be treated.
Beta blockers 	You should continue to take beta blockers if you received them while in hospital.

Medicine	
Nitrates 	Nitrates give immediate relief from chest pain. They relax and widen the blood vessels, which increases blood supply to the heart. If you continue to have symptoms of angina, you should be given nitrates to relieve your pain. Nitrates may be given as a glyceryl trinitrate (GTN) spray or a tablet to put under your tongue. While you are in hospital, it may be given as tablets placed under your lip or as a solution and drip into your arm.
Statins 	A statin is a medicine that helps to lower your cholesterol levels. You should be started on a long-term statin before you leave hospital.
Angiotensin converting enzyme inhibitors (ACE inhibitors) 	You should be started on a long-term ACE inhibitor within 36 hours if you have: • had a heart attack • unstable angina, or • damaged heart muscle. ACE inhibitors help to lower your blood pressure and reduce the work of your heart in pumping blood around your body. You may get some side effects from your ACE inhibitor. Your doctor, nurse or pharmacist should discuss these with you.

Medicine	
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: • have had a heart attack that was caused by the left side of your heart not working properly, and • are unable to take an ACE inhibitor.
Eplerenone 	Eplerenone belongs to a class of medicines called mineralocorticoid receptor antagonists. You may be given this if you: • have had a heart attack caused by the left side of your heart not working properly, and • have diabetes or heart failure.

You can use this space to write down information about your medication.

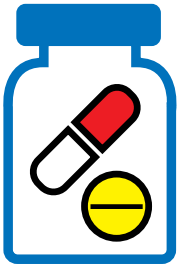
Complications

How will complications be treated?

Breathing difficulties

Non-invasive ventilation

Some patients develop fluid in their lungs. This is called pulmonary oedema. It may leave you short of breath so doctors should discuss with you whether or not you need non-invasive ventilation. This is when a mask is placed over your nose and mouth and oxygen is pushed into your lungs to make your breathing easier.

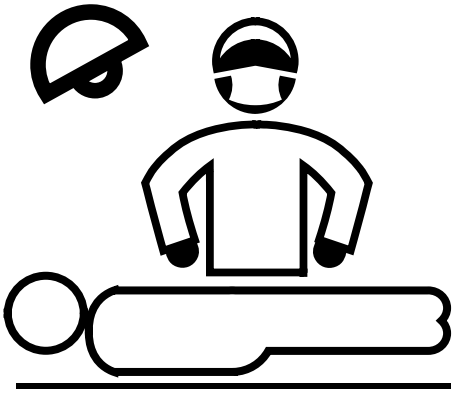


Low blood pressure or damaged heart muscle

Inotropic medicine

Some patients have a sudden drop in blood pressure (hypotension) and blood flow around their body. If this happens, your body is said to be in cardiogenic shock so you may be given inotropic medicine.

Inotropic medicine increases the force of the pumping action of your heart.



Urgent surgery

If a heart attack has severely damaged your heart muscle, it may be ruptured and not working properly. If so, your doctor should consider surgery within two days of your heart attack.

How will a heart attack affect my life?

How might I feel?

It is normal to experience such emotions as fear, anger and anxiety. You may have feelings of stress and worry that you have never felt before. While these feelings may pass, you may need some help from others. You can talk to your doctor or nurse any time about your feelings. The organisations listed on pages 24 to 27 can put you in touch with people who can help.

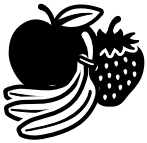
Strong recommendation

You should be offered early psychosocial assessment and treatment as part of your rehabilitation. This can help you understand and cope with your condition.

"It's important for doctors and nurses to recognise and discuss the emotional effects of having a heart attack." ***Patient***

How can I help myself?

Things you can do to help yourself to improve your chance of a good recovery.



eat healthily

limit the amount of alcohol you drink

keep your weight within normal limits

avoid smoking

keep fit by exercising

look after your mental well-being

What information should I receive when I leave hospital?

Patients with acute coronary syndrome often have misunderstandings about their illness.

So, before you leave hospital, your doctor or nurse should make sure you have suitable information.

Information

Your doctor or nurse should:

- ☐ discuss the benefits of cardiac rehabilitation and encourage you to visit your GP or contact your cardiac rehabilitation nurse for further information and support
- ☐ ensure you and your family are given written information on angina, heart attack, lifestyle changes and where to find more help and support
- ☐ explain to you and your family/carer that you may feel 'low', vulnerable or emotional when you get home as many feel 'good' in hospital just to have survived
- ☐ give you advice about exercise, resuming sexual activity, driving and returning to work
- ☐ ensure you have information about follow-up appointments and, if appropriate, a GP letter and telephone helpline card, and
- ☐ explain to you and your family/carer what you should do if symptoms return or you are not recovering as expected.

"Cardiac rehab helped me to get back on my feet again. I was able to learn about my heart attack and the things that could help. I was able to lead a normal life again." ***Patient***

Information

Across Scotland there are cardiac support groups working with various charities such as Chest Heart and Stroke Scotland (CHSS). These self-help groups are run by 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 25).

Support groups can give you and your family and friends:

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

You can read more about cardiac rehabilitation in the SIGN guideline on cardiac rehabilitation **www.sign.ac.uk** or request a copy by phoning 0131 623 4720.

Where can I find out more?

NHS inform

NHS inform provides a health and care information service for the people of Scotland, including information on over 850 medical conditions such as heart failure, high blood pressure, depression and diabetes.

Phone: 0800 22 44 88 (8am–10pm)
www.nhsinform.co.uk
Email: **nhs.inform@nhs24.scot.nhs.uk**

NHS inform A-Z articles
www.nhsinform.co.uk/health-library/subjects/heart-and-circulation-disorders

The Heart Zone

The Heart Zone provides a range of information and resources to support the self-management of short- and long-term heart disease, including a range of inherited and congenital heart conditions.

www.nhsinform.co.uk/heart

Organisations that help with heart disease

British Heart Foundation (BHF)

The BHF is the nation's heart charity and the largest independent funder of cardiovascular research. The BHF provides vital information for patients and carers. To speak to one of its cardiac nurses for advice and support, call its helpline. To order any of its publications, visit **http://bhf.org.uk/publications** or Phone. 0870 600 6566 or email **orderline@bhf.org.uk**

Phone: 020 7554 0000 • Heart Helpline: 0300 330 3311
www.bhf.org.uk

Chest Heart & Stroke Scotland (CHSS)

This is Scotland's health charity set up to improve 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

Phone: 0131 225 6963
Advice Line Nurses: 0808 801 0899 (9.30am–4pm, Monday to Friday) free from landlines and mobiles
www.chss.org.uk
Email: **admin@chss.org.uk**

Local support groups and telephone helplines

Phone: 0800 22 44 88 (8am–10pm)
www.nhsinform.co.uk/support-services

To find local support, visit the **Support Service Directory** on the NHS inform website.

Other websites

Action on Depression

Action on Depression can refer people to local support. They provide advice and information on low mood and depression.

www.actionondepression.org
Email: **admin@actionondepression.org**

Active Scotland

This website gives information and ideas on a range of indoor and outdoor activities in Scotland on land, water and in the air.

www.activescotland.org.uk

Blood Pressure UK

This charity is dedicated to lowering people's blood pressure to prevent disability and death from stroke and heart disease.

Phone: 020 7882 6218
www.bloodpressureuk.org • Email: **help@bloodpressureuk.org**

Breathing Space

Breathing Space is a free, confidential phone and web-based service for anyone who is experiencing low mood or depression, or who is unusually worried and in need of someone to talk to.

Phone: 0800 83 85 87
weekdays: Monday to Thursday 6pm to 2am
weekend: Friday 6pm to Monday 6am
www.breathingspace.scot

Diabetes UK

Diabetes UK provides information, advice and support to help people with diabetes manage the condition well, and bring people together for support when it's needed most.

Phone: (Careline Scotland) 0141 212 8710
www.diabetes.org.uk
Email: **careline.scotland@diabetes.org.uk**

How are SIGN guidelines produced?

Our guidelines are based on the most up-to-date scientific evidence. We read research papers to find evidence for the best way to diagnose, treat and care for patients. If we cannot find this out from the research evidence, we ask healthcare professionals to use their clinical experience and judgment to suggest treatments.

1

Identify questions

2

Search for evidence

3

Look at the evidence

4

Make judgements and recommendations

5

Publish

6

Let everybody know about our guidelines

You can read more about us by visiting **www.sign.ac.uk** or you can phone **0131 623 4720** and ask for a copy of our booklet *SIGN guidelines: information for patients, carers and the public.*

The Scottish Intercollegiate Guidelines Network (SIGN) writes guidelines that give advice for healthcare professionals, patients and carers about the best treatments available.
We write these guidelines by working with healthcare professionals, other NHS staff, patients, carers and members of the public.

If you would like a copy of this booklet in another language or format, such as in large print, please phone **0131 623 4720** or email **sign@sign.ac.uk.**

www.sign.ac.uk

www.healthcareimprovementscotland.org

Edinburgh Office
Gyle Square | 1 South Gyle Crescent | Edinburgh EH12 9E
Telephone 0131 623 4300 Fax 0131 623 4299

Glasgow Office
Delta House | 50 West Nile Street | Glasgow | G1 2NP
Telephone 0141 225 6999 Fax 0141 248 3776

The Healthcare Environment Inspectorate, the Scottish Health Council, the Scottish Health Technologies Group, the Scottish Intercollegiate Guidelines Network (SIGN) and the Scottish Medicines Consortium are key components of our organisation.

HEI Healthcare Environment Inspectorate
Ensuring your hospital is safe and clean

scottish health council
making sure your voice counts

SIGN

Scottish Health Technologies Group