

HEART SERIES H9

Chest
Heart &
Stroke
Scotland



UNDERSTANDING ATRIAL FIBRILLATION





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.

If you have any comments about this booklet please email: publications@chss.org.uk or tel: 0131 225 6963.

UNDERSTANDING ATRIAL FIBRILLATION

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INTRODUCTION

The function of your heart is to pump blood round your whole body. To do this the four chambers of your heart (2 atria and 2 ventricles) have to pump regularly and in sequence.

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

If the electrical signals within your heart are disturbed this is called an arrhythmia.

Your heart can beat too quickly (tachycardia), too slowly (bradycardia) and / or in an irregular way.

A normal heartbeat should be between 60 and 100 beats at rest. If you have Atrial Fibrillation (AF) your heartbeat will be irregular and may be as high as 200 beats per minute at rest.

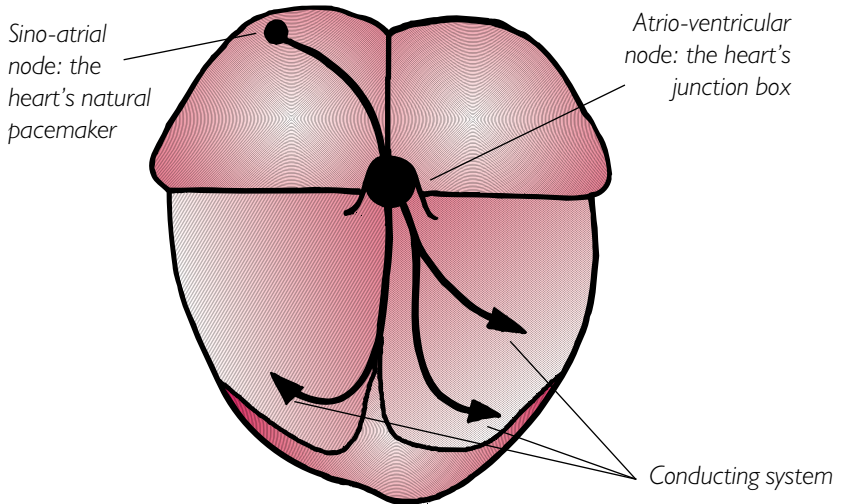
AF is the most common type of heart arrhythmia.

AF can affect adults of any age but it is more common in men than women and becomes more common with age. It affects approximately 2% of the general population, increasing to over 6% in people aged over 65.

HOW DO THE ELECTRICAL SIGNALS WORK?

Normally the electrical signal starts in the right atrium (see Figure 1) where the heart's natural 'pacemaker', the sino-atrial node, is situated. This signal crosses the atria, making them contract. Blood is then pumped through the valves into the ventricles.

Figure 1. Diagram of electrical pathway



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 ventricles contract. Blood is then pumped through the pulmonary and aortic valves into the main arteries. The 'pacemaker' produces another electrical signal and the pumping cycle starts again.

WHAT HAPPENS IN ATRIAL FIBRILLATION?

In AF the electrical signals in the **atria** become chaotic and disorganised making the atria contract very rapidly and in an irregular way. This is known as **fibrillation**.

The atrio-ventricular node can not pass on all of these signals to the ventricles but it still results in fast and irregular contraction of the ventricles.

This fast, irregular rhythm prevents the heart from pumping effectively and the circulation of blood can be impaired.



ECG tracing of a normal heart rhythm



In atrial fibrillation, the tracing shows tiny irregular "fibrillation" waves between heartbeats. The rhythm is irregular and erratic.

DIFFERENT TYPES OF AF

There are different types of AF and different degrees of severity. Each situation will be treated differently depending on how it affects the individual person.

- **Paroxysmal atrial fibrillation** comes and goes and usually stops within 48 hours without any treatment.
- **Persistent atrial fibrillation** lasts for longer than 7 days and can be treated with drugs or by 'cardioversion' to help the heart return to beating normally (see section on 'treatments' later in this booklet).
- **Permanent or chronic atrial fibrillation** lasts for a long time (usually longer than a year). Cardioversion is rarely used in this case and is not usually successful. Drug treatment can be used to help control the heart rate.
- **Acute-onset atrial fibrillation** is an episode of AF that either starts suddenly (for the first time) or when existing AF becomes suddenly worse. This kind of AF can cause potentially dangerous symptoms (e.g. very fast heart rate) which may need to be treated in hospital.

WHAT ARE THE SYMPTOMS OF AF?

There are varying symptoms with AF depending on the effect it has. Some people have no symptoms and AF is only discovered when a nurse or doctor feels your pulse and finds it to be **fast** and **irregular** (no pattern to the beats).

However, when the heart beats fast and in an irregular way it can not work efficiently and the following symptoms may occur:

- dizziness
- tiredness
- chest pain
- shortness of breath
- palpitations (increased awareness of your heartbeat)

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





WHAT CAUSES AF?

Sometimes AF develops along with other medical conditions such as:

- heart conditions such as: high blood pressure, coronary heart disease (especially after a heart attack or heart surgery), heart valve disease, congenital heart disease, cardiomyopathy
- lung conditions such as: pulmonary embolism, asthma, emphysema, chronic obstructive pulmonary disease (COPD), pneumonia and lung cancer
- an overactive thyroid gland
- diabetes
- imbalances in the blood, e.g. potassium and calcium

Sometimes the cause of AF is unknown.

WHAT TRIGGERS AF?

There are a variety of situations that can trigger an episode of, or contribute to, AF:

- drinking excessive amounts of alcohol, particularly 'binge drinking'
- being overweight
- drinking a lot of caffeine, e.g. coffee, tea and energy drinks
- taking illegal drugs, particularly those that stimulate the heart, e.g. amphetamines ('speed') or cocaine
- smoking



Learning to recognise your individual trigger factors and reducing, or avoiding, them can sometimes help to minimise the symptoms of AF.

WHAT ARE THE RISKS OF AF?

Stroke

The main risk of AF is causing a stroke. When the atria are not pumping effectively they do not always empty completely leaving a pool of blood in the chamber. This blood can become sludgy and may clot. If a blood clot enters the blood stream it may travel to the brain and lead to a stroke.

Heart failure

Over time AF can weaken the heart. 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.

WHAT TESTS MIGHT BE NEEDED?

Your doctor may decide to do some tests to diagnose AF and identify any possible underlying causes.

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.

An ECG can confirm the diagnosis of AF and can also help to rule out other types of arrhythmia.

Variations of ECG include:

- 24-hour ECG: (also known as '24-hour tape', holter monitor or ambulatory ECG) This records the activity of your heart over a 24 hour period as you go about your normal daily activities and can identify if you are having even just short periods of AF.
- Exercise ECG ('stress test' or 'treadmill test'): this records the activity of your heart as you make it work harder, i.e. by walking on a treadmill. You



will be closely monitored by medical staff during this test. It will be used to identify any underlying problems with the heart which have led to AF. Not everyone is able or fit enough to have this test or needs it.

Echocardiogram ('echo')

This is an ultrasound scan of the heart. It can help to identify any other heart problems and assess the structure and function of the heart and valves.

Chest x-ray

This will help to rule out any lung problems that might cause AF.

Blood tests

These are taken to rule out any imbalances in your blood that might cause AF or need to be corrected, e.g. thyroid function, electrolytes.

WHAT IS THE TREATMENT FOR AF?

Factors that your doctor should consider when deciding what treatment, if any, is best for your individual circumstances include:

- what type of AF you have
- what symptoms you have
- treatment of any underlying causes you have
- your age
- your overall health

Depending on what treatment you receive you may have to attend regular follow up appointments to help assess how the treatment is working for you. These may be with your GP or with a specialist heart doctor (cardiologist) or nurse.

Treatment for AF involves the following:

- controlling the heart rate (i.e. how fast it beats)
- controlling the heart rhythm (i.e. how regularly it beats)
- prevention of blood clots and stroke

Drug treatment

It is important that you take any prescribed drugs regularly and discuss any troublesome side effects, as well as any new symptoms, with your doctor. Sometimes you may have to try several different treatments until you find the right one for you.

The following groups of drugs can be used to treat AF:

- beta-blockers
- calcium-channel blockers
- anti-arrhythmics

See the CHSS booklet 'Understanding heart disease' for more information about commonly used heart drugs.

Cardioversion

Sometimes a treatment called cardioversion may be used, either on its own or in addition to drug treatment. Only some people with AF will benefit from cardioversion treatment. Your heart specialist will carefully consider whether this is a possible treatment option for you.

Cardioversion uses a controlled electric shock to the heart, from a machine called a defibrillator, to restore the normal heart rhythm. Cardioversion allows the conduction system of the heart to reset. It can be performed under a general anaesthetic or with sedation. Cardioversion can be repeated if necessary.

Other treatments that are used to treat AF:

Catheter ablation

Catheter ablation is a surgical procedure where any areas producing electrical signals which interfere with the natural pacemaker, are destroyed using a laser.

Insertion of an artificial pacemaker device

A pacemaker is a device that sends electrical pulses to your heart to keep it beating regularly. Some people with atrial fibrillation have a slower pulse rate than normal. In this case a pacemaker may be recommended.

PREVENTION OF BLOOD CLOTS AND STROKE

If you have AF then you may have an increased risk of blood clots and stroke (a stroke happens when a blood clot blocks an artery in the brain).

Your doctor may prescribe a medicine to reduce the risk of blood clotting and therefore reduce the risk of a stroke. This medicine is called an anticoagulant.

Warfarin is the most commonly used anticoagulant in people with AF but the use of the newer direct oral anticoagulants (dabigatran etexilate, rivaroxaban, apixaban and edoxaban) is increasing.

If you are prescribed warfarin you will need regular blood tests and your treatment will be closely monitored by your doctor and / or nurse.

Your doctor will decide which type of drug is best for you and for how long you should take it.

As well as benefit of risk reduction, there are risks associated with anticoagulants such as a risk of bleeding more than usual if you are cut or injured.

Except in an emergency, your doctor should discuss these benefits and risks with you before you decide whether to go ahead with treatment.



Warfarin

Warfarin is the anticoagulant most commonly used in AF. If you are prescribed warfarin you will need regular blood tests and your treatment will be closely monitored by your doctor and / or nurse.

How is my warfarin monitored?

The effect of warfarin is monitored by regular blood tests, that measure how long it takes your blood to clot, called the PT (Prothrombin Time) or INR (International Normalised Ratio of Prothrombin Time).

Based on this blood result your doctor will be able to prescribe the appropriate dose of warfarin that will help to keep your warfarin levels within the desired range for you.

See the CHSS factsheet 'Warfarin' for more information.

Direct oral anticoagulant drugs (DOACs)

Direct oral anticoagulant drugs inhibit (prevent) clots from forming in the blood.

Direct oral anticoagulant drugs currently in use in the UK are:

- Dabigatran (Pradaxa[®])
- Rivaroxaban (Xarelto[®])
- Apixaban (Eliquis[®])
- Edoxaban (Lixiana[®])

These drugs may be more suitable for some people with atrial fibrillation. Your doctor will be able to discuss this with you.

USEFUL ADDRESSES AND WEBSITES

AntiCoagulation Europe

PO Box 405,
Bromley,
Kent BR2 9WP
Tel: 020 8289 6875
Email: anticoagulation@ntlworld.com
Website: www.anticoagulationeurope.org

Arrhythmia Alliance

PO Box 3697,
Stratford-Upon-Avon
Warwickshire CV37 8YL
24-hour helpline: 01789 867 501
Email: info@hearhythmiaalliance.org
Website: www.arrhythmiaalliance.org.uk

Chest Heart & Stroke Scotland

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9 Haymarket Terrace,
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Email: adviceline@chss.org.uk
Website: 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.

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

ASK THE NURSE



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call our specialist nurses or visit

www.chss.org.uk

Chest Heart & Stroke Scotland (CHSS) is a wholly Scottish charity
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