

Atrial Fibrillation (AF) FACT FILE



Foreword

In the past few years, there has been a remarkable improvement in the understanding and management of Atrial Fibrillation (AF).

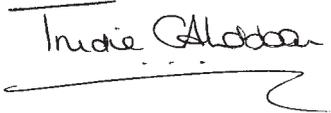
There have been many medical advances and innovations in the treatment of AF. Today, the outlook for people with AF is excellent and there is every reason to believe that quality of life will be as good as anyone else's.

When you are first diagnosed with atrial fibrillation, simply understanding your condition can be challenging, and that is before considering the wide range of treatment options available. Procedures like cardioversion and catheter ablation are regularly performed and new anticoagulant medication is prescribed routinely unless there is a medical condition that prevents this.

It is perfectly natural to have many questions, and with this in mind, the AF Association has worked with healthcare professionals and patient representatives to produce the AF fact file.

A diagnosis of AF is a dramatic event and often comes as a surprise. We hope this new resource will help address some of your initial concerns and help you feel more confident with living with atrial fibrillation.

Best wishes,



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Glossary

Ablation

A treatment which destroys a very small area of tissue inside the heart which is causing an arrhythmia

Antiarrhythmics

A group of medications used to suppress the irregular rhythms of the heart

Anticoagulant therapy

Medication which helps to reduce the risk of AF-related stroke

Arrhythmia

Irregular heart rhythm disorder

Atria

The two upper chambers of the heart

Atrial Fibrillation (AF)

A common heart rhythm disorder that causes an irregular and often abnormally fast heart rate

AV Node

Part of the electrical pathway between the atria and the ventricles

Beta blockers

Medicine used to slow the heart rate that can be prescribed in AF patients

Body scanning

A type of meditation in which a person focuses on or scans parts of the body

Bradycardia

A slow heart rate below 60 beats per minute

Cardiologist

A doctor who specialises in diagnosis and treatment of heart disorders and diseases

Cardioversion

The use of a small synchronised energy shock to stop fast or irregular heart rhythms

Cognitive Behavioural Therapy (CBT)

A talking therapy that can help you manage your problems by changing the way you think and behave

Electrophysiologist

A type of cardiologist who specialises in the diagnosis and treatment of disorders of the electrical system of the heart

Electrophysiology (EP) study

A study performed by an electrophysiologist that examines the electrical activity of the heart

Hypertension

High blood pressure

INR value

The International Normalised Ratio (INR) value shows how fast blood clots compared to what is considered 'normal'

Left atrial appendage occlusion (LAAO)

A term given to the removal or closure of the left atrial appendage. This can be achieved with surgery or an implantable device

Mindfulness

A branch of meditation bringing focus into the present moment

National Institute for Health and Care Excellence (NICE)

Provides national guidance and advice to improve health and social care

Pacemaker

A small device that is placed in the chest to help control abnormal heart rhythms (arrhythmias)

Psychological

A term used to describe a condition relating to or arising from the mind or emotions

Sinus node

The natural pacemaker of the heart

Sinus rhythm

Normal rhythm of the heart

Stroke

A medical condition where the brain is deprived of oxygen, which can be caused by a blood clot or a bleed in the brain

Tachycardia

A fast heart rate over 100 beats per minute

Ventricles

The two lower chambers of the heart which provide the most pumping force

Yoga

A physical, mental and spiritual practice. The word itself meaning 'union' or 'connection'



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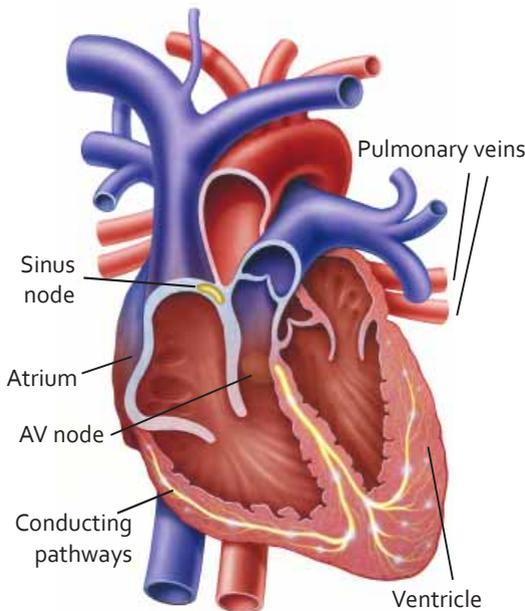
The heart during normal rhythm

The heart is a muscular pump, which delivers blood containing oxygen to the body. It is divided into two upper chambers (atria), that receive blood from the body, and two lower chambers (ventricles), which pump blood out to the lungs and through the aorta (main artery) to the rest of the body.

Normally, the heart beats in a regular, organised way, at a rate of 60-100 beats per minute (bpm).

This is because it is driven by the 'sinus node', a specialised group of cells situated in the right atrium, which emits electrical impulses. The sinus node is sometimes referred to as the heart's natural pacemaker. These electrical impulses spread through the atria and then into the ventricles via a connecting cable (the 'AV node'). The sinus node controls the timing of the heart, according to the needs of the body.

An example of this is during exercise, when the heart rate speeds up. When the heart is beating normally, we refer to it as 'sinus rhythm', or 'normal sinus rhythm'.



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What is AF?

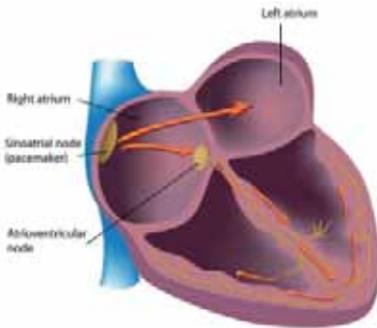
Atrial Fibrillation (AF) is an abnormality in the rhythm of the heart (an arrhythmia). It involves the upper chambers of the heart, the atria, beating irregularly. As the atria controls the normal (sinus) rhythm of the heart, this means that your pulse becomes irregular.

AF is the most common arrhythmia, affecting four out of every 100 people over the age of 65.

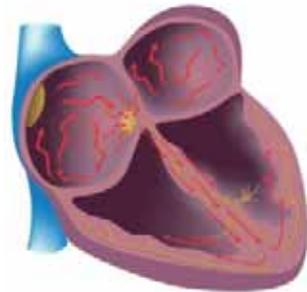
AF occurs when chaotic electrical activity develops in the atria, and completely takes over from the sinus node. As a result, the atria no longer beat in an organised way, and pump less efficiently. The AV node (a specialised cluster of heart cells) will stop some of these very rapid impulses from travelling to the ventricles, but the ventricles will still beat irregularly and possibly rapidly. This may contribute to symptoms of palpitations, shortness of breath, chest discomfort, light headedness, fainting or fatigue.

The goal of treatment for AF is to restore the heart's normal rhythm and if this is not possible, then to slow the irregular heart rate, to alleviate symptoms and prevent complications of AF.

Normal



Atrial Fibrillation



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Different types of AF

There are five categories of AF that describe the progression of the disease, ranging from occasional episodes to the complete absence of a normal heart rhythm:

First diagnosed AF:

AF that has not been diagnosed before, irrespective of the duration of the arrhythmia or the presence and severity of AF-related symptoms.

Paroxysmal AF:

Self-terminating, in most cases within 48 hours. Some AF paroxysms may continue for up to 7 days. AF episodes that are cardioverted within 7 days should be considered paroxysmal.

Persistent AF:

AF that lasts longer than 7 days, including episodes that are terminated by cardioversion, either with drugs or by direct current cardioversion, after 7 days or more.

Long-standing persistent AF:

Continuous AF lasting more than one year when it is decided to adopt a rhythm control strategy.

Permanent AF:

AF that is accepted by the patient (and physician). Hence, rhythm control interventions are, by definition, not pursued in patients with permanent AF. Should a rhythm control strategy be adopted, the arrhythmia would be re-classified as 'long-standing persistent AF'.



AF and you

A diagnosis of Atrial Fibrillation (AF) can be a dramatic event and often comes as a surprise. It can be hard to come to terms with. A common response is “why me?” especially if you have been conscious of your diet and tried to be fit and active. Whatever the cause of the AF, there will be a period of psychological adjustment following diagnosis as well as changes in how you think and behave.

At first, simply understanding your condition can be challenging, and that is before considering the wide range of treatment options available.

There have been many medical advances and innovations in the treatment of AF. The outlook for people with AF is excellent and there is every reason to believe that quality of life will be as good as anyone else’s.

Whatever your situation, a diagnosis of AF is an ideal time to take stock of your health and lifestyle, and that is where this booklet comes in. There may be things you can do to reduce the impact of your condition and to look after your health and heart.

There is not only life after diagnosis, but also a healthy and fit lifestyle with the right treatment.



Causes of AF

AF is often related to age, the older you get, the more likely you are to develop the condition. AF is frequently noted after an 'open heart' operation. Other conditions or diseases can also increase your risk of getting AF. This does not mean that AF always develops but the risk does increase.

Below are several conditions associated with AF:

- High blood pressure
- Coronary heart disease
- Mitral valve disease
(caused by rheumatic heart disease, valve problems at birth, or infection)
- Congenital heart disease
(abnormality of the heart present since birth)
- Pneumonia
- Lung cancer
- Pulmonary embolism
- Overactive thyroid
- Obesity
- Sleep apnoea
- Dementia

In addition, alcohol and drug abuse or misuse may predispose you to AF. While your risk of developing AF increases with the conditions mentioned above, many people develop AF for no explainable reason.

There is no 'typical' AF patient. AF occurs in men and women, in all races, and can occur at any age. While it can 'run in the family', many people diagnosed with AF will not have a family history of the condition. Some events and diseases may make AF more likely, but it can also occur without warning.

Symptoms of AF

Some people with AF do not have any symptoms, and it may only be discovered at a routine medical examination or following an admission to A&E with another condition. However, some patients may present with palpitations (being able to feel the increased and irregular heart rate), shortness of breath or chest pains.



The easiest way to detect AF is to feel your pulse. This should then be confirmed using an ECG.

Common symptoms of AF can include:

- Palpitations which may be rapid
- Tiredness
- Shortness of breath
- Dizziness
- Chest pains

AF-related stroke

The main risk associated with AF is stroke. This occurs because the atria are fibrillating and not beating in a co-ordinated way. As a result, the blood in the atria can become stagnant and then does not flow through the heart smoothly.

This causes blood cells to stick together and form a clot which can travel to the brain and result in a stroke.

In general, AF is not considered a life-threatening condition, as long as it is treated appropriately.



Anticoagulation therapy

AF increases the risk of stroke by 500%, a five-fold increase. It is imperative that an AF patient classed as 'at risk' is prescribed anticoagulant medication to inhibit the coagulation of the blood. Anticoagulation reduces the risk of clots and stroke. Any risk of AF-related stroke will have been assessed following your diagnosis, depending on your 'CHA₂DS₂-VASc' score. It is likely (especially if you are over 65 years old) that you will have been advised to take an oral anticoagulant. Your doctor will assess your personal risk of stroke, using a scoring system called the CHA₂DS₂ –VASc.

Question	Points	Your Score
Are you over 75?	2	
Are you aged between 65-74?	1	
Are you over 65 and female?	1	
Do you have high blood pressure?	1	
Do you have Diabetes?	1	
Do you have heart failure?	1	
Do you have Angina, suffered a heart attack or have circulation problems including problems with the aorta*?	1	
Have you suffered a stroke (even a mild stroke)?	2	
Total	-	

The scoring system is used to assess whether anticoagulation medicine is required. Treatment is recommended when your score is two or more, however in some instances treatment may even be recommended with a score of below two. Your doctor will decide your personalised treatment plan depending on your AF-related stroke risk.

Anticoagulants will not reduce or take away any symptoms of AF as they do not treat AF. Anticoagulants are prescribed to prevent blood clots from forming inside your heart and to reduce your risk of having an AF-related stroke. It is important to understand the effect of an anticoagulant on your body to ensure you receive the best therapy to suit you. It is also very important that you take your anticoagulant as prescribed by your doctor whether or not you are experiencing symptoms of AF.

Thanks to a number of medical advances, there are more anticoagulant options available than there were a few years ago. They all help to prevent the risk of AF-related stroke by slowing down and reducing the formation of blood clots. Your doctor will work with you to find the right therapy, taking into account your individual risk of AF-related stroke, any other medicines that you might be taking and your medical history. Anticoagulant therapy options currently available for reducing the risk of AF-related stroke can be divided into two groups; Vitamin K antagonists (VKAs) and Non-Vitamin K antagonist oral anticoagulants (NOACs).



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Vitamin K antagonists (VKAs)

VKAs affect how the liver uses Vitamin K to form proteins which regulate blood clotting. VKA therapy takes a few days to have an effect and it takes a few days for the effect to wear off when treatment is stopped, unless an antidote is given. Vitamin K is consumed in the body from food intake and is essential for the function of several proteins involved in the regulation of blood clotting. Vitamin K is found in many everyday foods, particularly green leafy vegetables.

The most commonly used VKA is warfarin. VKAs have been used as anticoagulants for more than 60 years. Two out of three AF-related strokes are prevented with warfarin compared to those not taking anticoagulant therapy. VKAs work by interfering with how your liver uses vitamin K. The effectiveness of VKAs is affected by the amount of vitamin K in your diet. If your diet is reasonably consistent, then the amount of vitamin K in your body will be matched by the warfarin dose. If the amount of vitamin K in your diet changes it can affect the ability of the VKA to prevent clot formation and the dose will need to be adjusted. Taking other medicines and consuming alcohol can also have an impact on how VKA works in the body.

Regular monitoring with blood tests is needed with VKAs by taking a blood sample from a vein. The specific test used to measure the blood's clotting capability is called the INR (International Normalised Ratio). By measuring the INR, anticoagulant clinics and healthcare teams can optimise the amount of VKA therapy given to a patient. Too little warfarin reduces the therapy's ability to prevent an AF-related stroke whereas too much warfarin can put you at increased risk of bleeding.

The dose of warfarin might need to be adjusted to ensure your INR remains within the target required for your condition. It might take a little while to get the dose right for you and initially your monitoring will be frequent. Once your INR is more stabilised your monitoring can become a little less frequent however it will still need to be done on a regular basis.

Regular monitoring can be done at your doctor's surgery or there may be the possibility for you to self-monitor. Self-monitoring involves the use of a hand-held device to measure the INR in a drop of blood, rather like monitoring blood sugar levels in diabetes. This testing can be undertaken in the comfort of your own home, at work or while away on business or holiday.



Non-vitamin K antagonist oral anticoagulants (NOACs)

NOACs are known as DOACs by some medical professionals (Direct Oral Anticoagulants).

NOACs work in a different way to VKAs to prevent the blood from clotting. There are four NOACs currently available in Europe: apixaban (Eliquis), dabigatran (Pradaxa), edoxaban (Lixiana), and rivaroxaban (Xarelto).

NOACs are proven to be safer than VKAs while being as effective or even more so. NOACs do not require monitoring with regular blood tests. Unlike VKAs, there are no interactions with foods. NOACs have fewer interactions with other medicine compared with VKAs and they are given at a fixed dose. NOACs start to work more quickly than VKAs and the effect of NOACs wears off quickly too if therapy is stopped.



Apixaban

In February 2013, apixaban was approved by The National Institute for Health and Care Excellence (NICE) for use within the UK. It is prescribed for reducing AF-related stroke risk in people with AF that is not caused by a heart valve problem.

Apixaban is a medication that has a direct effect on an enzyme called 'Ten A', often written 'Xa'. This is part of the clotting cascade that leads to the soluble fibrinogen being converted to the fibrous fibrin, then causing clots (thrombus). This controlled blocking of Xa stops the blood clotting as quickly so helps to prevent the formation of clots in the heart that can cause a stroke.

The recommended dose of apixaban is 5mg twice daily. If you are over 80, have low body weight, or impaired kidney function, you may be offered a lower dose of 2.5mg twice daily.

You should inform your doctor and dentist that you take apixaban before having any operation or procedure, or before changing or starting other medications including herbal remedies.

Apixaban is rapidly metabolised by the body, requiring a twice daily dose. In clinical trials, apixaban was shown to be at least three times more effective than aspirin in preventing AF-related stroke. There are no known lifestyle issues like those that apply to warfarin, and apixaban does not involve frequent blood monitoring.

There are few identified interactions between apixaban and other medications. Trials have suggested that there may be fewer bleeds in the brain (intracranial haemorrhages) and fewer fatal bleeds when compared with warfarin.

Apixaban's anticoagulation effect is not currently reversible. Its effects on the blood's clotting does reduce over a few hours (this is why it is taken twice daily) so a bleed would not be indefinite. If you are concerned about a bleeding event then you should attend an A&E/Emergency Department as they may need to assist.



Dabigatran

NICE approved the use of dabigatran in March 2012 for the prevention of AF-related stroke and systemic blood clots in patients with AF. Dabigatran is a medication that has a direct effect on the enzyme thrombin - it is called a direct thrombin inhibitor. It takes effect on the final step of the 'clotting cascade'.

Dabigatran is specifically licensed in patients with non-valvular AF without underlying heart valve disease, who have at least one or more risk factors.

It is also licensed for the treatment of deep vein thrombosis and pulmonary embolism, and as a preventive measure for these conditions. Unlike warfarin, dabigatran does not require regular blood tests to determine the dose. Dabigatran is also used in medical practice to reduce the risk of clots forming after orthopaedic surgery, such as a hip or knee replacement.

The recommended dose of dabigatran is 150mg twice daily. If you are over 80, have low body weight, or impaired kidney function, you may be offered a lower dose of 110mg twice daily. Unlike warfarin, dabigatran is rapidly metabolised by the body, requiring a twice daily dose. If a tablet is missed or overlooked then it should be taken as soon as possible after the missed dose is noticed, unless it is almost time for your next dose. Dabigatran requires acidic surroundings to help be absorbed, which is why you may find it causes indigestion problems. You are advised to swallow the capsules whole with a glass of water.

In December 2015, idarucizumab (Praxbind); a dabigatran-specific reversal agent was launched for emergency surgery or urgent procedures; and in uncontrolled bleeding. The use of Praxbind is restricted to hospital use only.



Edoxaban

Edoxaban is an anticoagulant drug that helps to reduce the risk of blood from clotting inappropriately. It does this by interfering with a substance in the body (Factor Xa, 'ten A') that is involved in the development of blood clots. Unlike warfarin, it does not require regular INR monitoring.

Edoxaban is licensed in the UK for use in nonvalvular AF patients to reduce the increased risk of stroke caused by AF. It is also approved for other indications specifically treatment and prevention of deep vein thrombosis (DVT) and pulmonary embolism which is a blood clot in the lungs.

The recommended dose of edoxaban is 60 mg once daily and should be swallowed preferably with water. It can be taken with or without food. If your kidney function is impaired, you have low body weight, or you are taking other medication that affects the amount of edoxaban required to be effective, you may be offered a lower dose of 30mg once daily. Talk to your doctor who will advise on the best dose for you.

The effectiveness and safety of edoxaban was assessed in the largest and longest trial with any novel oral anticoagulant in patients with AF performed to date. The trial was conducted in 21,105 patients and showed that edoxaban had similar efficacy to warfarin for stroke prevention.



Rivaroxaban

In May 2012, NICE published a recommendation for rivaroxaban as a possible treatment to reduce the risk of stroke in AF patients who are already assessed as being at increased risk of stroke and systemic embolism.

Rivaroxaban interferes with Factor Xa (Ten A) which is involved in the development of blood clots. Unlike warfarin, it does not require regular INR monitoring.

Rivaroxaban is licensed in the UK for use in non-valvular AF patients to reduce the increased risk of stroke caused by AF. Rivaroxaban is approved for other indications including reducing the risk of clots in adults who have hip or knee replacement surgery, and treating thrombosis due to a clot formation in the body (e.g. the leg), a DVT (deep vein thrombosis).

For stroke prevention in AF, rivaroxaban is administered at a fixed dose of 20mg once daily. If your kidney function is impaired, you have low body weight, or you are taking other medication that affects the amount of rivaroxaban required to be effective, you may be offered a lower dose of 15mg once daily. Rivaroxaban should be taken once a day with your main meal so that it will be completely absorbed.

Heparin

Heparin is an injectable anticoagulant used in hospitals and other clinical environments to rapidly 'thin' the blood. It provides protection from AF-related blood clots which may cause a stroke but has uses in other clinical situations as well such as pulmonary embolism, valvular heart disease and deep vein thrombosis. It has a rapid onset of action combined with a shorter half-life compared to warfarin. For this reason, it is often used so that perioperative patients, including those who may have been asked to discontinue their normal oral anticoagulant, spend as little time as possible unprotected from clot formation.



Transcatheter Closure of the Left Atrial Appendage (LAA) or Left Atrial Appendage Occlusion (LAAO)

Unfortunately, some patients at high risk of stroke are either unable or unwilling to take anticoagulants because of associated risks, or side effects. An alternative to medication for patients with AF at high risk of stroke is to close off the appendage with a medical closure device.

The device is designed to close the left atrial appendage (which is known to be the main source of blood clots in patients with AF), preventing clots from forming in the LAA, or breaking free from it and travelling to the brain.

Transcatheter closure of the LAA is carried out in a cardiac catheterisation laboratory, a specially equipped cardiology room where patients with heart rhythm disorders are examined and treated, or in an electrophysiology laboratory. The procedure lasts about 45-90 minutes. The procedure is usually done under general anaesthesia (but may also be done under sedation in some instances).

During the procedure, a cardiac ultrasound (echocardiogram) examination is undertaken (to get clear pictures of the heart) by placing a probe in the oesophagus. A small cut (or incision) is made in the groin and through this opening a small plastic tube (catheter) is inserted into a vein in the leg. This catheter contains the compressed umbrella shaped device which is used to close the opening of the left atrial appendage.

Using X-rays and ultrasound images, the catheter is guided into the heart. The umbrella-like device is then passed through the catheter and into position within the LAA. As the compressed device is pushed from the end of the catheter tip it expands, thereby blocking the mouth of the left atrial appendage

The patient may need to return to their doctor for periodic follow-up visits over the next year. The doctor will also advise the patient when normal daily activities can be resumed. Typically all strenuous activity should be avoided for one month following the procedure. If the patient experiences shortness of breath or chest pain, they should seek medical help immediately.



What happens after the procedure?

Recovery following the procedure will take about 24 hours. After recovery from anaesthesia and with adequate bed rest the patient should be able to sit up and walk around. Before leaving the hospital, tests such as an echocardiogram (ultrasound scan of the heart) may be performed to make sure the device is still positioned correctly.

As the procedure is minimally invasive, the recovery process is likely to be quick and easy. There may be an adhesive plaster used in the groin where the catheter was inserted. The patient may also have a sore throat due to the use of imaging probe (transoesophageal echo).

What are the benefits of the LAA closure?

The main benefit of this procedure is that it potentially eliminates the need to take anticoagulants. In the majority of patients who undergo the procedure, anticoagulation is continued for a minimum period of six to eight weeks post procedure so as to allow time for the implanted device to bed in. During this time, the body will form a new layer of natural tissue over the device, sealing it into place



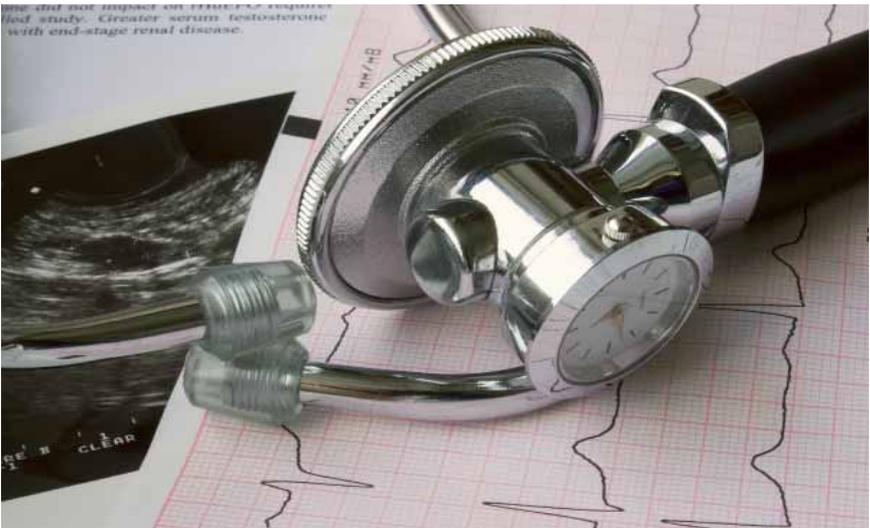
Are there any drugs I should not take with my anticoagulant?

Do not start any new medicine (prescribed and/or over the counter), supplements such as vitamins or herbal remedies without first checking with your healthcare provider or pharmacist.

Each anticoagulant is different, so it is important to ask your doctor or pharmacist in relation to the anticoagulant you are taking. VKAs such as warfarin interact with other medicines more than the NOACs.

Why treat AF?

Many people with AF have symptoms that are severe enough to cause them to seek medical attention. Even if you do not, it is still important to treat your condition as, over time, AF can cause other serious complications including increasing your risk of AF-related stroke and heart failure, if left poorly managed. Heart failure occurs when your heart has lost its ability to pump effectively, leading to heart damage that can be irreversible. AF is just one of many causes of heart failure.



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How is AF treated?

There are a number of different treatment options and variations of these treatments. The main distinctions in the treatment of patients are whether they are managed medically, through other nonsurgical interventions (cardioversion or catheter ablation) or by surgical procedures (pacemakers, surgical ablation).

All three management types aim to achieve one or more of the following goals for treating AF:

- Managing and controlling symptoms
- Restoring a normal heart rhythm
- Reducing the risk of a stroke

No single treatment has been shown to be effective for all patients with AF, and the choice of which will depend upon the severity of symptoms, the likelihood that the patient will respond to a particular treatment, and consideration of the risk versus benefits of each treatment option. It is important to discuss these issues with your doctor.

Drug treatment for AF

Currently, drugs are the most common treatment for AF, and have the aim of restoring the normal sinus rhythm, alleviating symptoms and reducing the likelihood of stroke. Commonly prescribed medicines include bisoprolol, verapamil, diltiazem, flecainide, sotalol, amiodarone, dronedarone and digoxin. These drugs are used in two different ways. Some are used to restore the normal heart rhythm, these are known as antiarrhythmic drugs. They work by blocking specific channels in the cardiac cells. Others aim to control the rate of your heartbeat whilst it continues in an irregular manner.



Rate control medication for AF

Rate control refers to slowing the irregular heart rate without attempting to restore the normal heart rhythm. Rate control is not inferior to rhythm control and is an attractive alternative in patients with a high risk of AF recurrence.

Drugs used to slow the heart rate aim to improve symptoms and prevent the effects of an uncontrolled irregular fast heartbeat.

Rhythm control medication for AF

A rhythm control strategy aims to use medication to return the heart to its normal rhythm. It is a major goal of AF management, because symptoms can be relieved, and the risk of AF-related stroke and other complications can possibly be reduced, but not eliminated.

A number of drugs are available to restore the normal heart rhythm. Sometimes your doctor might decide to accept that rhythm control drugs will not work. In that case, the doctor may use antiarrhythmic drugs to prevent your heart rate from going too high. Drugs are usually effective with either rhythm control or rate control but have side effects, so they need to be monitored.

Ask your doctor if you have any concerns prior to commencing treatment.



Beta blockers

Beta blockers are commonly used to slow the heart rate and are effective in active patients. These include bisoprolol, atenolol, metropolol, etc. They act by blocking the effects of adrenaline and other similar hormones, thereby decreasing sympathetic activity in the heart. They can only be used with great care in patients with asthma or emphysema and in patients with slow heart rates. Patients taking these medications will need their blood pressure and heart rate checked regularly by their doctor. The most commonly reported side effect is tiredness. Beta blockers will also stunt your heart rate response to exercise. You should be aware of this if you monitor your heart rate during exercise.

Class III drugs

These drugs work mostly by blocking the potassium channel in the cardiac cell. These drugs include sotalol and amiodarone. Sotalol is also a beta blocker and slows the heart rate, but at higher doses can act to stabilise the heart rhythm. The main side effects are related to slow heart rate and low blood pressure, causing symptoms of tiredness or fatigue, dizziness or fainting.

Sotalol can be dangerous if a patient has an illness with diarrhoea and vomiting. Sotalol should not be used if potassium losing diuretics are prescribed. Studies have shown amiodarone to be one of the most effective antiarrhythmic drugs. It is also safe to use in the elderly and in patients with underlying heart conditions.

Amiodarone has many side effects (pulmonary fibrosis, thyroid abnormalities, corneal deposits, abnormal liver function tests, and skin sensitivities) so needs regular monitoring by health care specialists.



Class IV drugs

Verapamil and diltiazem are class IV drugs which also slow the heart rate. They have to be used with caution in patients with heart failure. Adverse side effects include flushing, headaches, low blood pressure and ankle swelling. Any adverse side effects should be reported to your doctor immediately. Patients taking these medications should have their blood pressure and heart rate checked by their doctor. Combinations of beta blockers and calcium channel blockers can only be used with great care, bearing in mind the underlying heart pumping function. Diltiazem is a calcium channel blocker which acts by interfering with calcium in the heart cells. It works by affecting the cells calcium channels which influences the heart's electrical activity. The tablets can come in a huge variety of doses and types (slow-release/ modified release/ long-acting).

Class V drugs

In less active patients, digoxin can be used. Digoxin decreases conduction of electrical impulses through the AV node and increases vagal activity leading to an overall decrease in speed of conduction. The result is a decrease in heart rate. Combinations of digoxin and beta blockers may be required to achieve effective rate control. However, given its ineffectiveness during activity, it is not routinely used for rate control.



Pill-in-the-pocket technique

Patients with AF often ask their doctor whether it might be possible to take a medication only at the time that they experience an episode of AF in order to restore the normal rhythm, rather than taking it all the time to ward off attacks which might only occur rarely. In fact, it is not unusual for patients to forget to take medication when they have the normal rhythm and if they suddenly develop AF, they may then remember to take the medicines and often take a higher dose than normal. This is not recommended without full discussion with the physician, to ensure that it can be safely done.

Only some patients are suitable for this method of treatment. They should;

- be able to recognise the onset of the AF
- have attacks that happen no more frequently than at weekly or preferably monthly intervals
- have no significant underlying heart disease
- have no disabling symptoms during an attack (fainting, severe chest pain or breathlessness)
- be able to understand the proper way of taking the medication

The usual way to begin treating a patient in this way is by asking the patient to report to the nearest Accident and Emergency (A&E) department in the UK, or Emergency Department (ED) in the US, as soon as possible after the onset of an attack. The patient will have been given a letter to inform the A&E staff about the procedure. A routine 12-lead ECG should be performed to check the rhythm and the general state of the heart.

The patient should then be connected to an ECG monitor from which recordings can be taken if needed. The patient will be rested and given the appropriate dose of the antiarrhythmic drug which has been selected for use. This is taken with a small sip of water and the patient then lies down and relaxes, reads or watches the TV. The staff keep an eye on the situation and the ECG monitor is alarmed to alert the emergency staff of any change of the rhythm. From time to time, the blood pressure is taken.

In some cases, the technique does not work and the patient is discharged after about four hours, often after being given medication to control the heart rate and with an



appointment to see the physician in charge. In most patients, the AF does convert to sinus rhythm and the patient is allowed home after an hour of additional ECG monitoring.

Provided that the technique was shown to be effective and safe (no abnormal rhythm has developed, and the blood pressure has been stable), the patient is then allowed to self-administer the same dose of the same medication whenever AF re-occurs. Progress is monitored in the out-patient department and in conjunction with the family physician. Antiarrhythmic drugs that have been used in this way include flecainide, propafenone, sotalol and ranolazine, although none of them are specifically licensed for this mode of treatment.

Medication advice

Always remember to take your prescription or the original packets / boxes for ALL your tablets whenever you visit a nurse or doctor. This will help reduce mistakes in prescribing and helps when the doctors and nurses need to communicate about your treatment.

When taking a complicated 'cocktail' of drugs it can be hard to remember which tablets to take and when. It may be worth considering getting a tablet box which sets out all the tablets you need for the day or week and helps you to take them correctly and on time. It is also wise to check your tablets every time you have a new prescription – mistakes can be made. Sometimes your tablets may look different because they have come from a different manufacturer (even though the drug is the same).

If using a dossett box (with days times etc on), you should ensure your medication is stored as suggested by manufacturer. Some tablets should not be stored out of the packet for example. Speak to your pharmacist and they might be able to arrange this safely when issuing your monthly prescriptions.



Cardioversion

If AF has been present for only a relatively short time (usually less than one year), if the heart has not been damaged by disease or by the AF itself and if the cause of AF has been treated, is transient or is relatively mild, it may be possible to convert the heart rhythm from AF (or atrial flutter) to the normal heart rhythm (sinus rhythm). This procedure is called cardioversion; it may be achieved by giving the patient a rhythm control medicine (antiarrhythmic drug) by mouth (relatively slow response) or through the veins (relatively quick response). However, an electrical shock treatment, which at first sounds rather frightening, is usually the quickest and the most effective treatment.

Who should be considered for cardioversion?

During normal rhythm, the electrical impulse that activates the heart starts in the sinus node (natural pacemaker of the heart) and spreads through the atrium towards the AV node (electrical conduction pathway linking the atrium to the ventricle). The impulse passes through the AV node and down into the ventricles, leading to contraction of the ventricles which can then be felt as a pulse.

When AF occurs, the atria are activated electrically 500 – 600 times each minute. At such a fast rate, it is not possible for the atria to beat mechanically, but some of the electrical activations penetrate the conduction pathway (AV node) and activate the ventricles (the main pumping chambers of the heart) in an irregular fashion.

The result is often a rather rapid (up to about 180 beats per minute) and irregular pulse rate which the patient may sense (palpitations) or feel because of the chest pain, breathlessness, light headedness or fatigue that this rapid pulse may cause.

Patients with AF may be treated in one of two ways: Either by allowing AF to continue and controlling the pulse rate so that the heart operates at a rate which is close to the normal rate and causes none of the symptoms mentioned above. Alternatively, the physician and the patient may choose to try to convert the AF back to the normal rhythm by cardioversion.



AF
FACT FILE

This is usually appropriate if the patient is relatively young (a cardioversion may be considered for older people if criteria are met) and active, suffers from the symptoms of AF despite controlling the pulse rate, has had AF for a relatively short time (usually less than a year) and has no underlying heart or other disease that might be expected to restart the AF.

The treatment options should be thoroughly discussed by the doctor and patient in order to establish the best approach for the individual patient. When AF has only just started but shows no sign of stopping spontaneously, and when the patient is otherwise fit and well, it is easy to decide that cardioversion is the best treatment. However, in most cases before making this decision, a number of tests may be needed.

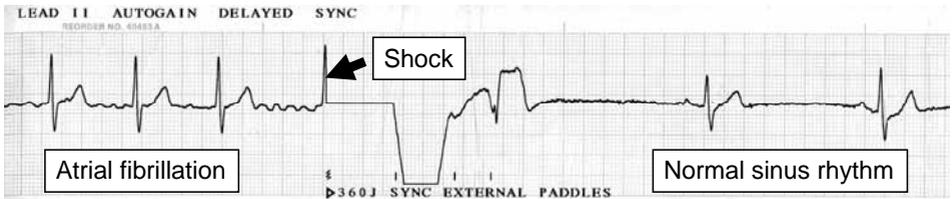


Figure 8: ECG showing the conversion of AF to sinus rhythm after a shock to the heart.



Preparing for cardioversion

During AF, blood may stagnate and clot, particularly in the left atrium. When the normal rhythm resumes and the atria begin to beat mechanically, a blood clot that has formed in the atrium can be ejected into the moving blood stream and circulate to the brain or another vital organ. The blood clot may obstruct an artery, for example in the brain, and the patient may suffer a stroke.

Cardioversion is often considered shortly after the onset of AF. The longer the atria fibrillate, the more likely a blood clot will form. Most physicians use a '24 or 48 hour' rule – if the AF has been present for less than 24 (or 48) hours, the patient does not need to be anticoagulated before cardioversion, although heparin will be injected into the veins at the time of cardioversion in all patients.

Most patients will then be recommended to use an anticoagulant for at least four weeks after the cardioversion procedure. Some who are at more risk than others will be strongly advised that they should never stop taking anticoagulation unless they develop serious side effects.

If AF has lasted for more than 24 or 48 hours there are two approaches to cardioversion. If it is necessary to restore the normal rhythm as quickly as possible, the patient may be offered another test – a trans-oesophageal echocardiogram performed using a probe which the patient swallows so that it lies in the oesophagus (gullet) at the correct level to look directly into the left atrium. It can then be seen whether a clot has formed and whether it is safe to proceed with cardioversion without prior anticoagulation. If a clot is not present, cardioversion may proceed as described earlier with heparin used during the procedure and anticoagulation given after the procedure.



However, if a clot is present or if the patient and physician choose not to use a trans-oesophageal echo test, the patient must be adequately anticoagulated for at least three weeks (but it often takes much longer) before a cardioversion is attempted. For this, the patient may be initiated on anticoagulation treatment by a GP or PCP (primary care physician) who has established a special service to do this, or at the hospital by a cardiologist working with the anticoagulation clinic. In this clinic, specialist doctors and nurses prescribe and monitor treatment with warfarin and provide literature and advice relating to anticoagulation.

If a patient is anticoagulated with warfarin, the treatment involves taking a carefully prescribed dose of warfarin and checking its anticoagulant effect by measuring a value known as the International Normalised Ratio (INR). This is a measure of how effectively the blood will clot; the normal value is 1 and higher values indicate 'thinner' blood. An INR level above 2 must be achieved for at least 3 continuous weeks before cardioversion. In order to improve the chance of this, many physicians routinely advise that the patient should aim at values of 3 (or between 2.5 and 3.5) for a period prior to cardioversion. However, the higher the value of the INR, the greater the danger of bleeding, so treatment with warfarin must always be carefully discussed with the prescribing doctor, particularly because alcohol, diet, as well as medicines may interfere with the action of warfarin.



Electrical cardioversion

While this may sound terrifying, it is very simple in principle and a highly effective treatment in carefully chosen patients. The idea is to use an electric shock to activate the whole heart at once. This prevents the continuation of AF rhythm, and so after the shock, the normal heart beat (sinus rhythm) will be able to emerge.

On the day of the procedure the patient should arrive at the hospital and follow the centre's guidelines on registration and admission.

In the cardioversion unit, the patient will meet the health care professionals involved with the procedure that day. The cardioversion procedure will again be explained in detail and a consent form may be completed by the person performing the procedure. The patient will be asked to sign the consent form, confirming that the cardioversion can proceed and that they have been fully informed about the procedure and its potential complications.

The patient may then move from the waiting area to the room where the cardioversion will take place – often a specialist cardioversion area, but sometimes a recovery area or an anaesthetic room. The cardioversion itself involves connecting the patient to an ECG monitor which in turn is connected to the cardioverter/defibrillator. Electrode patches or plates are positioned on the back and front of the chest, or on the upper right and lower left of the chest. A drip is positioned in a vein and an injection of short acting anaesthetic or powerful sedation is given. The patient is then asleep and/or totally unaware of the procedure.

The cardioverter/defibrillator is charged and set to deliver a shock simultaneously with the next heartbeat. Often the first shock is successful but sometimes several shocks at increasing energy levels or with different electrode patch positions are required to convert the rhythm. The normal rhythm is restored in about 90% of patients, but a small proportion immediately return to AF.

Over the next few days, 10% - 20% lapse back into the arrhythmia but this can be reduced when necessary by asking the patient to take an antiarrhythmic drug.



After the procedure, the patient is awake within a minute or so and, although groggy for a while, quickly regains full consciousness and will be ready to go home after a few hours. The ECG is monitored until the patient is fully recovered, a 12-lead ECG is recorded, and the patient is then allowed to get up and move around.

The patient should not drive for 24 hours after the procedure and should be taken home by a responsible adult. Someone should also stay with them on the night after the procedure in case of any complications.

Risks of cardioversion

- Slow heart rate (bradycardia) – usually very transient and at most needing treatment with an intravenous medicine (atropine) or a short period of pacing (electrical stimulation of the heart to initiate heart beats)
- Fast heart rate (such as ventricular tachycardia) which may need a follow-up shock before the patient regains consciousness
- Stroke, which is very unusual if the patient has been fully anticoagulated before the procedure, if the duration of the AF is short, or if a TOE (transoesophageal echocardiogram) has not demonstrated a clot in the heart
- Skin burns or irritation from the electrodes (patches) – this is unusual with modern patch electrodes but can happen more frequently with older metal paddle electrodes
- Early reversion of the normal rhythm back to AF – this may require further shocks (when still under anaesthetic/sedation)
- General anaesthetic risks – the anaesthetist will address any patient's specific concerns



Internal electrical cardioversion

Sometimes, if your BMI is high, or the external cardioversion has not worked even momentarily, your cardiologist may suggest another form of electrical cardioversion called internal cardioversion. In essence, it works in a similar way to standard electrical cardioversion, except the shock is delivered via a catheter placed temporarily inside the heart rather than via paddles placed on the chest.

The catheter is a narrow plastic tube which is passed in to the heart from a small puncture at the top of your leg and the shock is delivered from the catheter. The environment where internal cardioversion takes place can also be different, in that equipment is required for the cardiologist to position the catheter in the heart. The procedure is usually conducted in a room which looks similar to an operating theatre called a cath lab.

When you arrive in the cath lab you will be asked to lie on a bed in the middle of the room and a special large moving camera will be positioned above your heart. This camera is part of a system called a fluoroscopy system which allows the cardiologist to see a moving X-ray of your heart and the catheter which needs to be positioned correctly within the heart. When the cardiologist is ready to proceed he will inject a local anaesthetic into the top of your leg and pass the catheter into a vein. The catheter is then passed up the vein and into the heart, a process which takes only a few minutes and is not felt at all.

Once the catheter is in position, the cardiologist or an anaesthetist will inject a sedative which will make you temporarily fall asleep. They will then deliver a shock through the catheter, the purpose of which will be to reset the rhythm of the heart back to normal sinus rhythm in much the same way as previously described for electrical cardioversion. You will be then transferred to a recovery area and normally be allowed to leave the hospital later that day. The whole procedure usually takes about 30 minutes, most of which time is spent positioning the catheter in the correct place to deliver the shock.



Complications

These are essentially the same as for electrical cardioversion with the exception of skin burns and the addition of complications inherent in any catheter procedure described more fully by your cardiologist.

Medical cardioversion: Intravenous (injected through the veins) medicine

Several antiarrhythmic drugs can be used to convert AF into sinus rhythm. Flecainide, ibutilide (ibutilide is not available in the UK) and amiodarone can be used. If this procedure is selected, no anaesthesia or sedation is necessary. The injection is usually (depending on the drug chosen) given over a period of ten minutes to several hours.

During this time, the ECG is monitored continuously and may be recorded from time to time. The arrhythmia may terminate within minutes, but often it is one to two hours after the injection. The ECG is often monitored for some minutes to hours after the drug has been administered to be sure that any abnormal rhythm which may emerge may be quickly detected and treated. When the situation is stable, the patient is allowed to go home. If the AF has not been converted to normal sinus rhythm, another treatment strategy will be discussed with the patient.

Medical cardioversion: Medicines by mouth

It is possible to convert early onset AF (into sinus rhythm) by taking antiarrhythmic medicines by mouth. However, at normal doses, this may take several days or weeks to occur. Amiodarone is usually the most effective agent although sotalol and other drugs such as flecainide and propafenone may be effective in some patients. Administration of a higher than normal dose of antiarrhythmic medication is usually more successful, but this must be done initially in hospital to test the effect and safety of the technique.



What happens after cardioversion?

An hour or two after a routine cardioversion, the patient is allowed home after appropriate assessment. Preferably, the patient should be accompanied by a responsible adult and certainly should not drive, operate machinery or do anything requiring concentration and skill for 24 hours. The patient will be given anticoagulation medicine to take and may be informed about the likely duration of treatment with this medicine. Often, an antiarrhythmic drug is recommended, to be taken at least for some months after a successful cardioversion. The patient will receive an appointment for the out-patient department to discuss subsequent management.

Patients whose cardioversion have been unsuccessful are checked to ensure that they are well and then scheduled for an early out-patient visit.

If a complication has occurred, it may be necessary for the patient to remain in hospital depending on the nature and extent of the complication.



Ablation

Successfully managing atrial fibrillation can be difficult. At some point, doctors will likely discuss the term ablation, and in this context, it means the destruction of abnormal conducting tissue.

Using the various different types of ablation, the abnormal electrical signals within the heart can be blocked. The success of each approach varies and the type of AF you have can play a role in the options that are available. Surgical procedures also carry small but significant risks that the doctors will discuss with you.

Ablation is not suitable for everybody and is currently indicated for those who have failed to respond to two different drug strategies and whose symptoms impact severely on their lives. The procedure has not been proven to make a person live longer or specifically reduce the AF-related stroke risk, but studies are ongoing.

The most frequently used form of ablation is catheter ablation. Trials and research have shown this style of ablation procedure to have relatively low complication rates and good success rates for the appropriately selected symptomatic AF patients.

In some circumstances, surgical ablation is a very effective treatment, however this is carried out by a cardiothoracic surgeon, and is usually considered for AF patients either already undertaking an open-heart procedure, or for whom catheter ablation may not be the most appropriate option. Both catheter ablation and surgical ablation seek to stop future occurrences of AF.

In some symptomatic AF patients, it may be judged that neither surgical nor catheter ablation is appropriate, and antiarrhythmic drug therapies may either be contraindicated or no longer effective. Therefore, an AV node ablation and pacemaker implant (pace and ablate) may be considered as a suitable option. Unlike catheter or surgical ablation, this procedure does not stop the AF or remove the stroke risk but seeks to mask the unpleasant symptoms caused by the condition, particularly those related to the heart beating very fast.



Catheter ablation

The purpose of a catheter ablation is to stop the rogue electrical pulses that cause atrial fibrillation. These are predominantly found in the left atrium, most commonly close to or around the pulmonary veins. To achieve this, small areas of the tissue within the left atria are destroyed, commonly using either heat or freezing techniques. Once these lesions (areas of ablated tissue) have been formed, the scarred tissue acts to block and isolate the rogue electrical impulses thus preventing them from causing AF.

Before the procedure, information will have been given to you about which of your medications to take and which to avoid, plus how long you need to fast for (avoiding anything to eat or drink) prior to admission. You must follow these instructions carefully as your procedure may be cancelled if this is not done correctly, particularly regarding anticoagulation.

To assist with the procedure, it may also be necessary to have a detailed scan of the heart, such as a transoesophageal echocardiogram (TOE), CT, and/or MRI scan. These may provide useful information about the atrial chambers and pulmonary veins, which can make the procedure technically easier, and rule out a blood clot in the atria, which would make it too dangerous to proceed. You will be admitted into hospital either on the day of or the day before your procedure.

The ablation procedure usually takes a few hours and is performed with local anaesthetic and either sedation or a general anaesthetic. A thin, flexible tube (a catheter) is inserted into a vein in your groin, then carefully guided into your heart. The affected area/s inside your heart are identified and targeted with energy, destroying the tissue responsible for causing the abnormal heart rhythm. Catheter ablation can be done as a day-case procedure but may require an overnight stay in hospital.



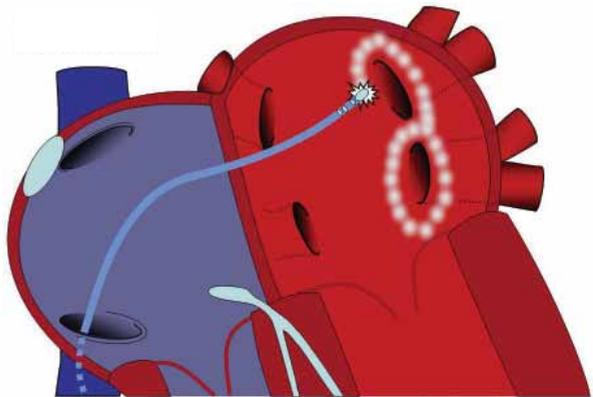
Radiofrequency ablation

Radiofrequency energy is applied from the tip of the catheter creating short bursts of high temperature heat to burn small areas of tissue. In order to isolate the electrical impulses causing the AF, a series of small dots are made around the pulmonary veins to create a ring which then completely isolates the area. In patients with more persistent symptoms, one or more lines may be also drawn within the atria to prevent the spread of these erratic signals and other areas ablated that might be possible causes of the AF.

Cryoablation

This is often used for treating paroxysmal AF and can isolate the pulmonary veins. The catheter has a small balloon at the tip that is filled with liquid nitrous dioxide which is extremely cold. This causes freeze damage around the affected tissue at the entrance to the pulmonary veins. These are then isolated from the rest of the heart, blocking erroneous impulses responsible for AF. Cryoablation may speed up the overall time of a catheter ablation procedure as a ring around the affected areas can be made in one smooth action.

In some cases, either radiofrequency or cryoablation alone will be sufficient. However, other patients require a combination of the two ablations to achieve a greater success level and benefit to the individual.



AF
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Laser balloon ablation

This form of ablation is normally performed under a general anaesthetic. The catheter has a balloon positioned at the tip as well as a camera (endoscope) inside it which allows the doctor to see inside the left atrium. This then allows the electrophysiologist (EP) to use the laser energy under direct vision and create a circle of ablation around the entrance to each pulmonary vein, predominantly for patients with paroxysmal AF.

A potential benefit of this approach is that the inflated balloon pushes blood away from the heart tissue so that all of the laser energy penetrates the tissue. This technology is still not used in many hospitals, and the numbers of ablations performed with it to date are much smaller than those with either radiofrequency or cryoablation. Initial results both in terms of success and risk look promising, and more experience with its use in the future will determine whether it is used more widely.

Surgical ablation

A surgical approach for the treatment of AF has been proven to be effective for a wide range of AF patients, even some with chronic AF. Surgical therapy for AF has until recently been reserved for a carefully selected group of patients who have failed medical therapy and are at risk of complications from medications or strokes. Recent advances in surgical therapy have changed this.

Criteria for selection have changed a lot in recent years, and surgical ablation is now established as a first or second line therapy.

In recent years, the development of a range of alternative energy sources and techniques has made the surgical approach less complex and more widely available. Surgical ablation approaches the heart from the 'outside' under direct vision (as opposed to catheter ablation which approaches the heart from the 'inside' via your blood vessels. As a result, it is much easier to demonstrate a complete conduction block, abolishing the AF).



Open heart surgical ablation

Many patients have been treated successfully with an open-chest surgical ablation ('cut and sew') operation often called a 'Cox-Maze' procedure. It can be successful, but it is highly invasive, requiring open-heart surgery and heart-lung bypass. It is quite complex and has largely fallen out of favour with the advent of radiofrequency (RF) ablation and other modalities of ablation that do not require open heart surgery.

Ablation can now be performed in the open chest, but it does not usually need the heart to be stopped nor bypass to be used. It is almost always performed at the same time as another procedure requiring an open chest such as a bypass operation or a valve replacement. This is called concomitant ablation. Department of Health and NICE guidelines endorsing concomitant ablation for appropriate patients with AF undergoing other cardiac surgical procedures.

In addition to the ablation, it is usual for the surgeon to remove or close off a small outpouching of the heart, the left atrial appendage, that is believed to be the main site where AF-related stroke causing blood clots form during atrial fibrillation. This is one of the key advantages of surgical ablation over catheter ablation, as it greatly reduces the risk of an AF-related stroke whether or not the ablation is successful.

Hybrid AF ablation

Recently some centres have started offering an approach to ablation of AF which combines a surgical and catheter approach. This is not routinely used in many centres but if your specialist thinks this may be of benefit to you then they will discuss it.



The benefits of catheter ablation

The desired outcome of a catheter ablation procedure is to stop, or significantly reduce, debilitating symptoms caused by AF, by blocking the ectopic impulses travelling from the atria to the ventricles, restoring a normal heart rate and rhythm. Trial evidence suggests that the overall success rate in achieving this (i.e. stopping AF/symptoms caused by AF) is between 85-90% after two ablation procedures with paroxysmal AF, and about 70-80% with persistent AF. There is a lower success rate when only one procedure is carried out, with approximately 40-50% not requiring further ablation procedures.

More research is needed to provide stronger evidence for using cardiac ablation, as studies so far are on a limited number of patients and follow-up is only over a relatively short period of time.

Safety of catheter ablation

When deciding whether or not to undergo the ablation, the risks need to be balanced against the potential benefits. If there is very little to be gained, even the smallest risk may make a procedure unacceptable. When considering ablation for AF it should be remembered that the main reason for undergoing the ablation is to improve your quality of life by reducing or eliminating symptoms that result from the AF.

The amount of improvement you hope to achieve should be a balance of the likelihood of success, the number of ablation procedures that may need to be undertaken, and the risk of complications that accompany each ablation procedure. Although some research suggests that AF ablation can improve the heart's pumping function in some patients, and reduce the risk of stroke, this is not clearly established. Improving symptoms and quality of life are the main reasons for having the procedure, and patients at high risk of stroke are strongly recommended to continue anticoagulation even after an apparently successful ablation.



What are the risks of ablation for AF?

Unfortunately, all procedures that involve the heart have a small risk of a serious complication. It is important that you understand what these risks are, so you can make the decision of whether you want to have the procedure performed. These will always be discussed with you by your doctor before the procedure.

Minor problems that may occur are chest pain during the ablation (which may feel like severe indigestion) or bruising and soreness in the groin after the procedure. An x-ray is used during the operation, which could damage an unborn child. You must tell your consultant if there is any chance you could be pregnant. Serious complications are fortunately unusual. Overall, there is a serious complication rate of between 2-4%, depending on your local centre.

A pericardial effusion is a collection of fluid (usually blood) contained in the sack surrounding the heart. In the setting of an ablation, it is usually the result of perforation of the heart muscle, with subsequent bleeding into the space around the outside of the heart. It is most likely to occur during the time of the ablation procedure and is due to trauma from the wires or burns required to perform the ablation.

The anticoagulant used to prevent blood clot formation contributes to the bleeding risk. A collection of blood around the heart can compress it and reduce its ability to pump effectively, causing a fall in blood pressure (cardiac tamponade). During the ablation procedure, continuous blood pressure monitoring is used to alert the medical team to the possibility of tamponade. Small pericardial effusions may not cause any problem. The diagnosis is confirmed by performing an ultrasound scan (echocardiogram). Small effusions usually don't require treatment but if tamponade occurs, where the fluid compresses the heart then urgent action is required. A small tube (pericardial drain) is inserted under the ribs and breast bone into the pericardial space to drain away the excess fluid.

The drain may stay in for a day or so until the echocardiogram shows the blood has gone and there is no further bleeding. The drain may be uncomfortable, causing sharp chest pains, and painkillers are often required. The inflammation from the pericardial effusion may even provoke an attack of atrial fibrillation. Anticoagulation medication may be withheld for a few days before being restarted. Very rarely, if there is ongoing bleeding which does not stop, urgent heart surgery is required to find the damage and repair it.



Pulmonary vein stenosis (PV stenosis) is a recognised complication associated with atrial fibrillation ablation. The PVs are blood vessels that carry blood into the left atrium from the lungs. Stenosis of the PVs means that the veins become abnormally narrowed as a result of the ablation treatment within the region of the pulmonary veins. One or more pulmonary veins need to be severely narrowed before symptoms are noticed. PV stenosis has become less frequent, as nowadays, ablation is usually in the atrium around the veins, rather than inside the veins. However, modern techniques now involve burning in the atrium rather than the vein itself, and the incidence of PV stenosis has fallen and is now a very rare complication in most centres. Typical symptoms of PV stenosis include breathlessness, coughing and haemoptysis (coughing-up blood). The diagnosis is made using MRI or CT scans and nuclear perfusion scans. PV stenosis is often left untreated, but sometimes angioplasty (stretching open the narrowed vein with a balloon) is undertaken.

Stroke is perhaps the most feared complication of ablation for atrial fibrillation. It occurs when the blood supply to the brain is affected, usually by a blood clot blocking a blood vessel, but may also be due to bleeding within the brain. The ablation procedure takes place in the left atrium, from which blood is pumped out of the heart directly to the brain and other vital organs. If the ablation causes a blood clot, debris or an air bubble this may be pumped into the head and block a blood vessel.

To minimise this risk, great care is taken during the procedure and blood thinning medication (heparin) is infused to reduce the risk of clot formation. The cardiologist will also thin the blood with warfarin or another anticoagulant after the ablation procedure while the heart settles down. Currently, patients at high risk of AF-related stroke are recommended to continue anticoagulation indefinitely even if the ablation appears to have been successful. This is because “silent AF” which is not felt by the patient, is quite common, and the first sign of AF recurrence may be a stroke. Also, the risk of stroke is possibly affected by age, the extent of the ablation procedure and the patient’s other medical problems.

The need to be anticoagulated during and after AF ablation means that a slightly increased risk of bleeding complications is the price paid to protect against the much more devastating complication of stroke or heart attack.



A false femoral aneurysm is when blood leaks out of an artery in the leg at the site of the needle puncture, but is contained by the surrounding tissue, creating a pouch. It usually happens within a day or two of the procedure and may be the result of straining or movement. The anticoagulation required after an ablation may contribute to its occurrence.

A false femoral aneurysm is usually painful (which may feel as though it is pulsating) and a lump may be found. Some of the blood will clot and dissolve, causing a dramatic bruise. The diagnosis is made by examining the puncture site and confirmed using an ultrasound scan.

Treatment varies depending on the extent of the leak. In some cases, observation is sufficient, as the clot will reabsorb naturally. Occasionally a radiologist or vascular surgeon will treat the problem by injecting thrombin, a clot-forming drug, to seal the leak. Alternatively, surgical correction of the arterial perforation may be required.

An atrio-oesophageal fistula is an extremely rare but very dangerous complication. This is a hole that forms between the back of the left atrium and the oesophagus (gullet) which lies just behind. This hole allows air bubbles and oesophageal contents into the blood circulation. It is caused by an inflammatory process triggered by the ablation burns. Signs and symptoms can appear without warning in the first few weeks after the ablation procedure: typically, patients are extremely unwell with high fever, chills, stroke, collapse or vomiting blood.

Immediate recognition and treatment is vital. If you have the above symptoms you should seek emergency medical help and make sure this complication is considered. Because atrio-oesophageal fistula is so rare (one in every 1-2 thousand cases), it may not be suspected by doctors who do not undertake AF ablation. Diagnosis must be made urgently using a special scan (usually CT).



Endoscopy (telescope of the oesophagus) should generally be avoided as it may worsen the condition. If atrio-oesophageal fistula is present, it is unfortunately usually fatal, but emergency chest surgery has occasionally saved the patient's life.

Phrenic nerve palsy The phrenic nerve controls the diaphragm, one of the important muscles involved in breathing. There is one phrenic nerve for each side of the diaphragm.

On the right, the phrenic nerve runs down immediately in front of the pulmonary veins and may be damaged during catheter ablation of AF. Phrenic nerve palsy is seen more commonly with cryoablation than radiofrequency ablation. During cryoablation of the right sided pulmonary veins, phrenic nerve function is monitored continuously and ablation can be stopped immediately if there are warning signs. Phrenic nerve palsy usually causes some degree of breathlessness. A chest x-ray confirms the diagnosis. There is no specific treatment, and in most cases, recovery is complete.

A retroperitoneal bleed is when there is a leak from the femoral artery that enters the area around the back and kidneys rather than around the groin. It causes pain, low blood pressure and may interfere with kidney function. Treatment usually involves blood transfusion and stopping anticoagulation medication. In severe cases, vascular surgery may be required.

Pneumothorax (collapsed lung), is caused by accumulation of air or gas in the pleural cavity around the outside of the lungs. This occurs as a result of injury during insertion of the tubes into the subclavian veins, which lie under the collar bone. Many operators do not insert tubes into the subclavian veins, preferring to do everything from the femoral (leg) veins. Depending on the size of the pneumothorax, treatment varies from observation to insertion of a chest drain, which allows the lung to re-inflate.

Death is fortunately a very rare complication of ablation. It could potentially result from a number of mechanisms including stroke, cardiac tamponade, myocardial infarction (heart attack), or atrio-oesophageal fistula. Extremely rare drug reactions or anaesthetic complications are also a remote possibility. The risk of death from AF ablation is about 1 in 1000.



AF FACT FILE

Preparing for an ablation

The following advice was written by patients, for patients to help them prepare for a catheter ablation. It is intended to provide general, non-medical information that will help the patient understand what is likely to happen during and after the procedure so that they can be prepared for the time they will be in hospital.

The procedure can be performed either under general anaesthetic, or under sedation, and the time it takes may vary depending upon several factors including the technique used, how long the AF has been present, and other individual patient characteristics.

A short time before the procedure, it is normal for the patient to attend a pre-operative assessment to ensure that they are prepared and understand the medical aspects of the procedure. It is advisable if possible, to take someone with you as it may help you to remember the information provided and for them to take notes. Also take along a recent prescription of current medications.

You will be asked about your medical and surgical history as well as any allergies you may have and medications you take. An ECG and blood tests may be done. You may be given a fact sheet about the procedure to take home with you. It is important to make a note of any adjustments to medication you must make before the procedure takes place.



Obviously, situations will differ between hospitals but generally you will be asked to attend in good time to prepare for the procedure. Do not worry if you are in sinus rhythm as the electrophysiologist can induce AF as and when required. You should also be prepared to shave your groin in preparation for inserting the catheter(s). The pre-operative assessment will have informed you of their 'nil-by-mouth' policy (what you can eat and drink and when) and what medications to take and/or omit that day.

Try to take as little "luggage" as possible but there are some items that you may find helpful and they will be covered later. For patients opting for sedation, once preparations on the ward are complete, you will be taken to the cath lab where you will meet the team performing the procedure. For some, all the equipment can be quite intimidating, but the team will make sure you are comfortable before the procedure begins.

The doctor (or electrophysiologist) will carry out the procedure with the help of a physiologist (cardiac technician), who provides technical support. A nurse will also be on hand to look after you and assist the doctor and a radiographer, who will control the x-ray equipment. Before the procedure starts you will have adhesive patches attached to areas, such as your arms, back, chest and legs. These are necessary to monitor you and to allow all the equipment to work normally. There will be a blood pressure cuff on your arm, which will inflate during the procedure and a clip on your finger measuring the amount of oxygen in your blood. It may be necessary for you to wear an oxygen mask.

The procedure is performed with long thin wires called catheters, which are guided into your heart via tubes inserted in the groin veins. These are often inserted into either or both sides of your groin and sometimes into your neck or under your collar bone. First these areas will be cleaned and covered with sterile drapes (paper or cotton sheets), and then you will have local anaesthetic injected at these sites, similar to that used at the dentist. Although this will sting for a few seconds, it will cause the skin to become numb so that the insertion of these tubes is painless. Again, experiences vary but generally any pain or discomfort is minimal, but should you begin to feel uncomfortable, you should tell the consultant and he will adjust the sedation accordingly.

You may be asked to lie with your arms by your side during the procedure. If this is the case, you should avoid moving and ask a member of staff for assistance i.e. to scratch



your nose or move things for you. This is to avoid disturbing any of the equipment by lifting your arms from under the sterile drapes.

The first part of the procedure is to introduce several wires into the veins of the leg (or neck), move them into the right atrium, and from there to the left atrium. This last movement is done by making a small puncture hole between the right and the left atrium. This is called a “transseptal puncture” and it allows your specialist doctor to perform ablation in the left atrium. The catheters are then placed into the left atrium and ablation is performed. You may feel some chest pain at this point and if this is too unpleasant you should ask for more painkillers.

Throughout the procedure a nurse will be monitoring you closely and he/she will always be available if you need anything, such as painkillers or sedation. Patients opting for general anaesthetic will, of course, be unaware of anything until they regain consciousness in the recovery ward.



Back in the ward

Once the procedure is completed and you are returned from the recovery room to your ward you will be asked to lie still and flat for several hours. This is to prevent any strain on the groin so that the healing process can begin as soon as possible. Your groin area will be monitored closely, as will your blood pressure and general condition. Normally, water will be provided but you might find it useful to take sports style bottles so that you can drink with minimum movement.

Restricting movement for several hours can be challenging so consider taking a tablet computer or books/magazines, but also take earphones so that you do not disturb other patients who may wish to sleep. Some people suggest taking lip balm to keep your lips moist and also disposable underwear as bedpans may be used during this period. A charger for your phone is also useful, as well as money for the hospital television and radio service if available.

Once the nursing staff are happy with the condition of the groin wound you will be asked to gently walk in the ward and also be encouraged to test your bowel and bladder movements. Normal hospital meals are provided, and it is quite normal for some people to be discharged the same day whilst others stay at least one night in the hospital.

Discharge

All being well, it is normal to be discharged later the same day or the following morning. You will be provided with details of any changes to your medication and information about protecting the wound in your groin. Make sure you have contact details for the arrhythmia nurse or anybody else that can give you medical advice, should you require it.

When leaving the hospital, it is very important that you are escorted by a family member or a friend. You must not carry anything and try to avoid stairs as this could cause damage to the groin. If possible, avoid using public transport as it will be more difficult to deal with any issues should you feel unwell. It is much better to go home in a car.



Back home following ablation

Of course, you will be relieved when it is all over and you are in the comfort of your own home, but it is very important that you do not do anything strenuous for the first week and not much more for the second. It is therefore useful to arrange to have the freezer topped up and plenty of bread and milk available. If you live on your own try to arrange some help for the first week at least. Do not be tempted to do too much, even if you feel well and able, as it can put a strain on both your groin and heart. It is easy to overlook the trauma your heart has experienced. If your groin is bruised consider how your heart must feel! Additionally, organising adequate childcare if appropriate is also important.

The DVLA (Driver and Vehicle Licensing Agency) in the UK and DMV (Department of Motor Vehicles) in the US forbid driving a car for a minimum of 48 hours after the procedure. But many hospital teams will advise people not to drive for up to a week. This is mainly to minimise problems with the puncture sites in the leg(s). If you drive a bus or lorry or another large vehicle then you should check with the arrhythmia nurse/ablation team about when you can drive those again.

Remember it can take up to three months or even longer for the heart to properly heal. During this time you may experience runs of AF, ectopic beats (missed heartbeats) and a heart rate faster than before. It will be helpful if you record such events so that they can be discussed at your review appointments.

Recovering from an ablation

This section has been written and prepared by patients, for patients, in the hope of allaying many of the fears and anxieties which often occur following ablation for atrial fibrillation. It is the result of peer discussion and hopefully includes many of the "things nobody told me" which had caused worry in the weeks and months following an ablation.



Rest

Although you may not have a great scar to show it, your heart has suffered some trauma and will take time to recover. The general recommendation is to take things very easy for the first week (short walks and only a single flight of stairs, generally within the house, or not very far outside), and a slow, gentle progression following that. Some very fit or younger patients may find that they can return to work quite quickly, but many others take much longer. Above all listen to your body and don't push yourself too hard. If you are still working then discuss your condition with your employer and explain that the situation may be fluid. Do not lift anything heavy for at least a week. Above all, you are not a failure and everyone's recovery is very individual, so do not be rushed.

Palpitations after an ablation

Because the heart does not heal immediately you may experience some palpitations, ectopic beats (missed beats) or even runs of AF in the time after your ablation. **THIS DOES NOT MEAN IT HAS FAILED.** If you experience pain, difficulty breathing or are passing out, then please contact the arrhythmia nurse and/or team where your ablation was carried out. Palpitations and other symptoms should gradually fade over time. In fact, many patients found that even six to nine months later their quality of life was still improving.

Sore throat after an ablation

You may find that you have a sore throat after your procedure. This is probably due to having had a transoesophageal echocardiogram (TOE) during the procedure to check for any clots which may be present in your heart. It may also be caused by breathing equipment if you had a general anaesthetic. Treat as any other sore throat and it will soon pass.



Migraine aura after an ablation

A migraine may shock and worry you but it is perfectly normal. Not everybody suffers from this, but it is quite common usually about two to three days after the ablation. It results from the transseptal puncture needing to gain access from the right to left atria. You may find vision disturbance with either flashing lights or blind spots in your sight often with a following headache. Don't worry, you are not having a stroke or going blind, and the symptoms will pass after a week or so. However, if you are concerned then contact the team who did your ablation/arrhythmia nurse, your GP or PCP, or if you feel very unwell then go to A&E/ED.

Ectopic beats after an ablation

Ectopic beats, which feel like missed beats, can be common following ablation. They are considered harmless but can be distressing when frequent. This does not mean that your ablation has failed. Try slow, deep breathing. Use your diaphragm rather than shoulders and breath slowly and deeply for at least five minutes, slowing your breathing down to less than six breaths a minute.

Another side effect is the development of left atrial tachycardia which sometimes occurs in patients in whom AF is eliminated, but the ablation burns lead to a different rhythm disturbance. This may require treatment in the first few months after the ablation with drugs and/or cardioversion but may then settle down and does not mean the ablation has been unsuccessful.

Groin/leg bruises after an ablation

You may find that you get a colourful bruise where the entry wound for the catheter is. You may even find a hard lump there. Don't worry as this is quite normal. When it finally fades away, you know that your heart is beginning to heal so it can be a useful guide to when you can start pushing your recovery a little more. However, if you are concerned at all about infection (pus, increasing redness of the area, temperature, poor wound healing), or the wound site in general, contact your arrhythmia nurse/ablation team or GP/PCP.



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Fast heart rate after an ablation

It is not uncommon to find that your heart rate is a faster than before your AF started and you had your ablation. Typically, this may be around 85-90 bpm which is a common side effect of the ablation. It may take six to eight months (or even longer) to return fully to earlier levels but don't worry, it will normalise. Again, it does not mean that the ablation has failed.

Bloating and digestive problems after an ablation

Some people find that they suffer from abdominal discomfort post-ablation. This is probably caused by irritation to the oesophagus during the procedure, or sometimes to a nerve near the heart known as the vagus nerve. It will usually disappear within a few days but can be alleviated with normal indigestion remedies. Alternatively, see your GP for other medication if needed.

Depression, anxiety and worry after an ablation

Many patients suffer with anxiety post-ablation, worrying that it has not worked due to some of the above-mentioned symptoms. This can be a highly emotional time and these feelings are not uncommon, so please do not worry if you fall into this category. Try to remain positive but if you find that you have such difficulties, then do talk to your doctor and look into things like mindfulness and cognitive behavioural therapy which can be helpful.

When to seek medical help

There are a few rare but potentially serious complications that can occur after an AF ablation. These will have been discussed with you before the ablation is done. If you feel very unwell or experience any new or unusual symptoms such as sudden weakness in an arm/leg and/or unexplained fevers it is worth seeking medical attention urgently. If you are just not sure about some symptoms that do not bother you too much then you can always seek help less urgently from the arrhythmia nurse/ablation team or your GP/PCP.



Will I be able to stop my medication after the procedure?

Heart rhythm tablets:

If the procedure is successful you should be able to stop most of your heart rhythm drugs. Your specialist may wish to keep you on some of these medications for a few weeks or months to allow your heart to recover and get used to being in a normal (sinus) rhythm again. In some situations, these drugs may be controlling another problem, such as blood pressure (e.g. beta blockers) in which case you may be advised to continue them.

Anticoagulants:

If you were taking an anticoagulant before the procedure you will need to continue this for a period of time afterwards, depending on your doctor's guidance. Even if your heart remains in sinus rhythm, you may still be advised to continue the anticoagulant to reduce your risk of stroke in the future. The circumstances for each patient are different and you will need to discuss this with your doctor and/or arrhythmia nurse.

DO NOT CHANGE
OR STOP TAKING YOUR MEDICATION
WITHOUT CONSULTING YOUR DOCTOR FIRST



Will the procedure work for me?

The success of this procedure depends on several factors:

- The type of AF you have (paroxysmal, or persistent)
- Whether or not you have any other heart disease
- The experience and the equipment available to the hospital where you have the procedure performed

You should discuss these factors with your heart rhythm specialist.

To achieve the levels of success for paroxysmal and persistent AF, it may be necessary to undergo two or more procedures. For persistent AF, the shorter the time you have been in AF, the better the results are more likely to be.

Many hospitals feel that persistent AF which has been present for more than three to five years has such a low chance of success that they will not recommend catheter ablation as an appropriate therapy option. Current figures report that approximately 30-40% of people will require more than one AF ablation procedure, and this figure rises to 50% for those with persistent AF. The need for a second or third procedure is normally due to the recurrence of symptomatic AF or the development of left atrial flutter/tachycardia. This occurs in a small proportion of patients in which the fibrillation is abolished but the ablation lesions promote more organised rhythm disturbance.



Pacemaker and AV node ablation for AF

Often referred to as 'pace and ablate', this procedure is more commonly considered in patients who are symptomatic but assessed as unsuitable for catheter or surgical ablation, or whose previous ablations have been unsuccessful.

The approach allows the atria to remain in fibrillation but seeks to control the way this affects the overall heart beat which travels from the atria into the ventricles. The electrical link between the atria and the ventricles is known as the 'atrioventricular node' (AV node).

AV node ablation may usually involve firstly implanting a pacemaker, usually done as a day-case procedure. Once the pacemaker leads have settled (approximately six weeks after implant), you will be called back into hospital for a review and then prepared for AV node ablation.

Again, for this procedure you are usually only in hospital for the day. AV node ablation involves destroying the AV node with heat (radiofrequency ablation) in order to prevent the abnormal, irregular impulses being transmitted to the ventricles. Once this has been done the ventricles will usually contract at a very slow rate. For this reason, the pacemaker has to be implanted first so that it is in place and ready to begin pacing the heart rate at a level sufficient for normal activity – usually between 70-120 beats per minutes, although this can be adjusted to suit each individual's needs.



Caring for someone with AF

Because there are few or no visual signs that someone has AF, it can be difficult for others to appreciate what someone with AF is going through. Psychologically, the heart is what keeps us alive, and coming to terms with AF and a possible risk of stroke can take time for both sufferer and carer. A problem shared is a problem halved, so the saying goes, and a willing ear can make a huge difference.

A diagnosis of AF will mean more visits to the GP/PCP, a cardiologist, or perhaps an anticoagulation clinic and someone with AF may need lifts to and from appointments.

It can be difficult to appreciate the impact of AF on the sufferer because it is not a visible condition, and if in addition the sufferer is in denial, they may not see the importance of taking their medication and may skip doses.

Partners may find that increased demands on their time will mean that they have to make adjustments to their schedules.



Healthy eating and AF

As someone with AF, there are a number of stroke risk factors that you can reduce by eating a healthy diet. For example, eating the right diet can:

- Help lower your blood pressure
- Help reduce your cholesterol
- Help you control your weight
- Help reduce the risk of other conditions such as diabetes

If you are on warfarin, you need to be mindful of the vitamin K content in food, because this has a knock-on effect on INR levels, and this in turn affects your dose of warfarin. It is important to keep a healthy and relatively consistent diet. You should not try to change your International Normalised Ratio (INR) level by regularly altering your diet as this may lead to poor INR control.

A simple rule is that leafy green vegetables tend to be rich in vitamin K and root vegetables, fruits and cereals tend to be low in vitamin K. The key is to eat a sensible diet. Take the warfarin at approximately the same time each day. If you wish to make major changes to your diet or start taking a 'health supplement', discuss this with your doctor or the clinic which monitors your warfarin therapy.

In general, they will not restrict your choices but may wish to increase the level of monitoring for a period as you make changes. Once your blood levels are seen to be stable again, then you will return to your normal monitoring intervals.

Foods high in vitamin K		Foods low in vitamin K	
Asparagus	Lettuce	Apples	Lamb
Green beans	Mungo beans	Banana	Lemons
Blackberries	Mustard greens	Beef	Melon
Blueberries	Peas	All cereals gincluding flour, etc.)	Oranges
Broccoli	Pine nuts	Cherries	Peaches
Brussel sprouts	Raisins	Chicken	Pork
Cabbage	Sugar snap peas	Cranberries	Shell fish
Chicory	Soybeans	Fish	Strawberries
Collard greens	Spinach		Tofu
Cranberry juice	Swiss chard		
Kale	Watercress		
Kiwi fruit			



For those who are not on warfarin, there are no hard and fast rules when it comes to diet, because everybody's metabolism is different. However, we do find that the following things seem to be fairly common in triggering an AF episode:

- Large, carb heavy meals
- Alcohol is not recommended to exceed 14 units per week. A small glass of wine is one unit, a half pint is one unit, and a measure of a spirit is one unit
- Caffeinated tea, coffee and fizzy drinks or energy drinks
- Chocolate, as it also contains caffeine
- High levels of salt, especially if you suffer from high blood pressure
- Grapefruit has an enzyme which may interact with certain heart medications and may need to be avoided

If you are not sure what food or drink might be affecting your AF, it might be a good idea to keep a diary of triggers. It is a good idea to record things like whether the symptoms appeared after taking medication, if you had been feeling relaxed or panicked, the duration of the episode, and what you may have been doing on the lead up to your episode. Keeping such a diary can reveal previously unnoticed patterns and highlight things that you could avoid in the future.

The point of trigger avoidance is to only avoid them if you discover that they are a trigger. In other words, don't deprive yourself of a coffee or glass of wine, if they do not trigger AF.



Eating Well – top tips

- Take time to plan ahead – for example pick a time at the weekend when you can plan your meals and shopping, so you always have healthy choices on hand
- Get a really simple recipe book with quick, easy and healthy options or check online if you use a computer or tablet
- If you are buying packaged food ALWAYS read the label

Keep a particular eye on your salt, sugars and saturated fat content to help you stay within healthy limits

- If you are trying to manage weight think about:
 - 1 Weighing portions to help with portion control
 - 2 Using standard sized crockery and not overloading your plate
 - 3 Adding high volumes of vegetables to your meals to fill you up as they are very low in calories and very high in protective nutrients and fibre
 - 4 Avoid keeping unhealthy items at home – for example, salted snacks, cakes and biscuits. If they are not there you cannot eat them
 - 5 If you have a freezer, then try making your own healthy ready meals – cook larger batches of food and weigh out sensible portions and freeze them
 - 6 If you are unable to cook, look for pre-cooked chicken and fish in the supermarket which you could add to a healthy salad packed with different ingredients
- If you have not cooked before or do not feel confident cooking, then just experiment! Cooking is very creative and can be great fun, so do not be scared of giving it a go
- If you have a sweet craving, try fresh or dried fruit, or a small chunk of dark chocolate to see if you can avoid raiding the biscuit tin
- Dehydration and hunger can feel very similar, so try a glass of water and see how you feel before you decide you need to eat



Exercise and AF

In an individual developing AF, the first steps in terms of exercising is a proper medical assessment. Once that has been achieved and appropriate medication has been prescribed, physicians would normally encourage an individual to return to full and normal activities and to maintain general cardiovascular fitness.

Exercise is an important component of a healthy lifestyle and exercising according to a paced approach at a level with which you are individually comfortable is sensible from a cardiovascular and emotional perspective. Prolonged periods of inactivity can be as harmful as overly strenuous exercise: moderation is the key.

The best thing to do is to listen to your own body. While some people are comfortable with running marathons, others may feel better going for a slow walk. As we know with AF, nothing is black and white, and the same rules do not apply to everybody. Exercise is an important part of a healthy lifestyle but exercising at a level with which you are individually comfortable is very important from a cardiovascular perspective.

Walking regularly is an excellent way of keeping fit, as is tai-chi. However, if you plan to try more strenuous exercise such as a sport or going to the gym, it is a good idea to discuss this with your clinician before starting.

Swimming is a great aerobic exercise. If you have been going for some time with no ill effects, it is probably fine for you. Humans are adapted for life on dry land and immersing the body in water squeezes blood from the extremities towards the chest. Cold water can have the same effect, as it causes surface blood vessels to narrow as a natural response in order to conserve heat. This could have implications for blood pressure and AF.



Regular exercise, especially aerobic exercise, has many benefits. It can:

- Strengthen your heart and cardiovascular system
- Improve your circulation and help your body use oxygen better
- Increase energy levels so you can do more activities without becoming tired or short of breath
- Increase endurance
- Lower blood pressure
- Improve balance and joint flexibility
- Strengthen bones
- Help reduce body fat and help you reach and stay at a healthy weight
- Help reduce stress, tension, and depression
- Boost self-image and self-esteem
- Improve sleep
- Make you feel more fit and healthy

How often should I exercise?

In general, you will achieve maximum benefits by gradually working up to an aerobic session of at least 20 to 30 minutes, at least three to four times a week. Exercising every other day will help you start a regular aerobic exercise schedule. The more exercise you can do, the better for your fitness, but any amount of exercise is beneficial to your health and helps ease your symptoms. You can combine aerobic and strengthening exercises or do them at separate times.



How do I monitor my exercise intensity?

Exercise effort can be monitored by observing your heart rate and ensuring it does not rise higher than a specific number (target heart rate). For safe and effective exercise it is recommended that you exercise between 60% and 75% of your maximum heart rate. This can be determined by subtracting your age from 220 (estimated maximum heart rate) and multiplying this by the relevant percentage.

It is important to remember that everyone is different and heart rate targets are very specific to each individual. This is a basic equation and you should be aware that differing levels of fitness and some cardiac medications, including beta blockers may alter your heart rate targets.

For most people the only way of obtaining an accurate target heart rate is by being assessed by an exercise professional who is experienced in cardiac conditions.

You can monitor exercise intensity by counting heart beats (your pulse) over one minute. This length of time is important when you have AF due to the variation in your heart rate and rhythm. Taking your pulse by counting your heart beats with your fingers is a very accurate and useful technique to learn. However, when you are exercising it can be impractical to do this. If you do adopt this mode of heart rate and rhythm monitoring you will usually have to stop exercising which can allow your heart rate to slow reducing the benefits or can make you feel dizzy. It is therefore essential to keep your feet moving by marching lightly on the spot or tapping your heels. This helps to keep your blood moving back up to your heart.

Many people have trouble finding their pulse. There is a technique to it, so it is best learnt from someone who knows how. A nurse at your doctor surgery would be a good person to ask for help.



What is too much activity?

You are working too hard if:

- You cannot 'walk and talk' for example if you cannot say your telephone number, including the area code, out loud and without gasping. If this happens slow down until you can say your telephone number without gasping
- You become excessively tired either during or sometime after exercise or general activity
- You are uncomfortably short of breath or perspiring profusely
- You have chest pain or discomfort (angina)

Pacing yourself is the key to successful progress!

When not to exercise

- If you feel unwell, such as having a cold, flu or a viral infection
- Directly after a meal - wait two hours before you exercise
- If you feel tired on a particular day, take the day off from exercise or exercise less
- In extremely hot weather you may tire more easily
- If you have been diagnosed with heart failure, or have an Implantable Cardioverter Defibrillator (ICD) or a Cardiac Resynchronisation Therapy (CRT) device fitted you should consult your GP/PCP or local cardiac rehabilitation service before embarking on an exercise regime



The psychological impact of AF

Everyone experiences stress in life and sometimes this can lead to symptoms of anxiety and depression. The medical community are increasingly beginning to understand that living with any long-term medical condition will add stress and worry. There are a number of therapies which can help to reduce stress and teach us how to manage stress and worry. Below, you will find a list of some of the therapies which can help and explain how the therapy addresses issues to help support you in living with your condition.

We all experience stress, and at times it can feel overwhelming. If you think you need help, support or advice, then talk with your local health care professional for advice on how to access support and try some of the therapies we have outlined for you.

For more information, contact AF Association at info@afa.org.uk in the UK and info@afa-us.org in the US

Alternative therapies

Far from being 'faddy' or 'new age', steps to promote emotional wellbeing can complement the more 'visible' forms of treatments prescribed by clinicians in the form of drugs. They can have a significant role to play in finding a holistic answer.

While research into some complementary therapies is inconclusive, some AF Association members have talked about the benefits they have received from yoga and acupuncture, and The National Institute for Health and Care Excellence (NICE) has acknowledged that some complementary therapies can be beneficial.

Some people have claimed that acupuncture can alleviate headaches, decrease pulse rate and is associated with a lower incidence of paroxysmal AF.



The benefits of yoga for AF

Yoga is a traditional Hindu discipline including physical, mental and spiritual practices, which helps to integrate the mind, body and soul, and also improves physical health. There are many different types of yoga, but all focus on three main aspects: breathing, posture and meditation. Yoga is widely practised for health and relaxation purposes. It can help with physical aspects such as strength, flexibility and even weight loss, but it is also very powerful in helping with stress reduction, relaxation and focussing the mind on the present.

Why is yoga good for me?

It is said that heart rate is controlled by both the heart and the brain. Yoga is a practice which connects the heart and the brain, creating a perfect balance between the body and mind. It is widely recognised that yoga can reduce anxiety and stress. It is also suggested that it can improve cardiovascular function by decreasing the heart rate and blood pressure and can increase blood flow in the body. Regularly practising yoga can be a way of helping to relieve stress and anxiety, thereby helping you to cope with your condition. Yoga can help provide a powerful connection between the mind and the body, which can be very helpful for those with an arrhythmia.

As well as the physical effects and symptoms of AF, a lot of people struggle with anxiety, stress and depression. There is almost always a psychological adjustment following a diagnosis of AF, and unfortunately for many people, these thoughts and feelings can become overwhelming or difficult to overcome. Anxiety and stress can increase the heart rate, and increase the frequency and severity of AF episodes. It is widely accepted that yoga can dramatically reduce anxiety and stress, and in turn can help with your AF.

How can I practice or learn yoga?

With constant increasing popularity, yoga classes are becoming easier and easier to find. Most gyms and leisure centres provide classes that are suitable for beginners, intermediate and experts. Yoga DVDs are widely available for the ease of practising in your own home, and it is even possible to find many tutorials online. Although many forms of yoga are gentle and safe, some forms are more strenuous and may not be suitable for everyone.



Mindfulness and AF

With modern life becoming increasingly busy, it is easy to stop noticing things around you, or how you might be feeling. This can lead to your emotions getting on top of you. Living with an arrhythmia can breed anxiety and worry, which can revolve around focusing heavily on the physical symptoms and fear that can be associated with these.

Mindfulness is a branch of meditation that has grown in popularity over the years, which involves concentrating on the senses.

Mindfulness is defined as 'paying attention to what is happening in the present moment (in the mind, body and external environment) with an attitude of curiosity and kindness'. It is often used as a therapeutic technique and has been found to alleviate symptoms of a variety of mental and physical disorders in a physical study.

Practising mindfulness meditation in your day-to-day life can allow you to respond calmly to symptoms of an arrhythmia when they arise, as it teaches you how to be aware of physical sensations in the body, without becoming overwhelmed by them. This technique can also help to prevent you from slipping into unhelpful and negative thinking patterns. Alleviating stress and worry in this way can support a reduction in the severity and frequency of arrhythmia episodes.

As well as reducing anxiety levels, mindfulness can lower your blood pressure, heart rate and increase your immune function.

Why not have a go?

Find a quiet and calm place to sit. The point of mindfulness is to be aware of the experiences you are having through your senses in the present moment. Try to focus on your breathing, paying attention to the physical sensation. It is easy for your mind to wander in thought but try to keep bringing it back to the present. It is normal for thoughts to constantly flow through your mind but try to let them pass like rolling clouds. Close your eyes and try to concentrate on what you can smell, feel and hear right now.



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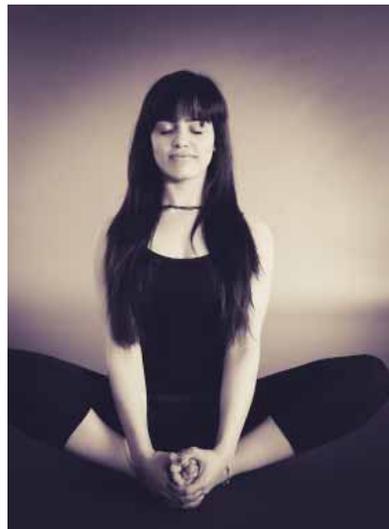
Relaxation

In a world that is becoming increasingly fast paced and stressful, it has become more important than ever to be able to offer yourself some time to relax. Relaxation can help to combat stress, anxiety and worry, by releasing physical and mental tension. It is also very beneficial to your mental health and well-being, as well as helping you sleep better and improve your mood.

Stress can overwhelm your body, which in turn releases chemicals preparing your body for a 'fight or flight' response, even when it is not necessary. If you are a person who experiences stress on a daily basis, this can have a big impact on your body and physical health.

For some people, the thought of fitting relaxation into daily life may seem like you just don't have the time. However, it can take as little as five minutes per day to help reset your mind and outlook, and ease away the feeling of stress and anxiety.

Some relaxation tips include listening to music, lighting a candle or some incense, having a massage, deep breathing, going for a walk, dancing, reading a book or simply talking to a friend or settling down to watch a film. Deep breathing is a simple but very helpful relaxation technique, that can be done anywhere at any time.



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Body scanning

Body scanning is a well-known type of meditation or mindfulness that can be very beneficial for people with many different medical conditions, including AF. It is a method that is used for drawing attention to specific parts of the body, focusing on the sensations you may be experiencing as you work through the body. The aim of body scanning, is to notice and be aware of how each part of the body feels, without trying to change anything, or labelling any sensation as 'good' or 'bad'. Trying body scanning is a great way of learning to live with your condition and learning that you can lead a happy and healthy life with AF.

To begin, find a comfortable place to lay down either on a bed or the floor, making sure it is calm and quiet. Closing your eyes may help you to focus. Allowing yourself as much time as you need for this, take some deep breaths in and out. You can start from your toes or the top of your head, working your way up or down the body, moving over each part of the body as you go. You may notice any sensations, such as tingling, pressure, tightness, or nothing at all. If you notice your mind wandering, do not worry, just notice that this is happening, and then gently bring back your attention.



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FACT FILE

Cognitive Behavioural Therapy (CBT)

Cognitive Behavioural Therapy (CBT) is a psychological approach whose effectiveness has been most clearly established in research trials, and for this reason it is recommended as the treatment of choice by NICE for a wide range of physical health conditions. Some more recent variants of CBT, especially those which incorporate ideas of mindfulness and acceptance are increasingly being advocated. More traditionally associated with eastern philosophies, these have been demonstrated to have a direct impact on our physiology, as well as a patient-reported quality of life.

AF can impose a considerable impact on an individual's quality of life. People with AF report significant levels of psychological distress about intrusive and disabling symptoms (fatigue, breathlessness, nausea, palpitations), losses and changes in roles (work, health, activities) and challenges to independence (relationships, mobility and sense of self). Many people with an arrhythmia experience troubling anxiety with worry and fear associated with their symptoms, some report panic and others experience depression. Whilst some people seem to push on in spite of this, others find it a frustrating and disabling condition. Furthermore, psychological distress has been found to have an effect on response to medical treatment and advice – people who are more distressed tend to respond less well to treatment.

CBT can be very effective in helping to address anxiety and depression related to various conditions. This talking therapy can help you understand the things that trigger and contribute to your experience of arrhythmia related emotional reactions, and to develop more adaptive ways of responding to your condition. There is evidence that Cognitive Behavioural Therapy (CBT) results in improvements in emotional distress. CBT is available as an NHS treatment and is provided by Improving Access to Psychological Therapies (IAPT), or it may be available in your local cardiology service. There are free online resources dedicated to CBT and medication.



Mindfulness based CBT

Mindfulness based CBT was originally developed to support an individual's long-term recovery from depression. Mindfulness is defined as paying attention to what is happening in the present moment (in the mind, body and external environment) with an attitude of curiosity and kindness. For people with AF and atrial flutter it can be useful to help notice calmly and respond helpfully to symptoms. In emphasising that we can always deal with things as they come up in the moment, MBCBT can also help to resist getting drawn into unhelpful and distressing thought.

Acceptance and Commitment Therapy (ACT)

Acceptance and commitment therapy places great emphasis on the need to accept those difficulties and hardships which are out of our control, and which are an inevitable part of life. This does not mean giving up, but rather ACT helps you to feel that only when we accept this, can we stop throwing energy uselessly at what we cannot change. Then instead we can consciously choose to direct our precious and limited time and energy to things which will improve our quality of life and give us purpose and meaning.



Intimacy and AF

Anxiety about the impact of physical activity on triggering and worsening AF is common. This can lead some people to feel worried about the safety of sexual activity. Losing interest or confidence in sex can affect you and your partner if you are in an intimate relationship. It can also affect how you feel about yourself and life in general.

Having a loving and satisfying sexual relationship is safe and indeed recommended by doctors.

Sexual activity is a form of exercise, and it has cardiovascular benefits including increased blood flow, heart rate and deep breathing. All of these improve circulation of oxygen and hormones to organs and muscles. It improves the cholesterol balance and burns calories.

Having intimate contact also promotes overall stress reduction. It boosts the immune system and has been linked with higher levels of an antibody (immunoglobulin A), which can protect us from getting colds and other infections. It reduces the risk of prostate cancer in men and helps to minimise a woman's risk of incontinence later in life. It releases a hormone called oxytocin, the so-called 'love hormone', and this promotes sleep which is linked with other benefits such as maintaining a healthy weight and blood pressure. The deep relaxation that typically follows sex may be one of the few times people actually allow themselves to completely let go, surrender and relax.

If you have concerns about having sex following a diagnosis of AF, you can always discuss this with your doctor. The topic of sex can be difficult for patients to talk about but remember that your doctor and nurses are used to talking about these things and they are there to offer you the information and advice you need.

AF can contribute to erectile dysfunction – in fact this symptom sometimes leads to diagnosis in the first place. If you are thinking about using a drug to treat this, talk to your doctor, because they are aware both of your medical history and any possible drug interactions which might require monitoring. Having said this, it is not uncommon for AF patients to be safely prescribed erectile dysfunction medications.



Travelling with AF

Before you go

Make an appointment with your doctor. They know your medical history, so they are always the best person to advise you.

- Tell them how long you are going away for and which country you are visiting
- Ask if you need to take any precautions
- Ask if any immunisations are necessary and whether they interact with anticoagulation
- If on warfarin, discuss self-monitoring options for INR while away
- Ask them if any significant local time changes will make a difference to how you take medication
- Discuss any other particular concerns which you may have

Find out about local medical facilities and make a list of hospital telephone numbers and addresses, and if applicable, pacemaker and device specialist centres. If you have a device fitted, it may be uncommon at some locations. Find out if there are facilities for testing INR nearby if you take warfarin.

Ask AF Association about travel insurance companies who have favourable terms for those living with AF.

It is a good idea to carry a medication alert card or wear a medical ID bracelet or necklace during the trip. This can state your medical condition, any implanted devices you may have, medication you take, and your doctor's contact details. Digital ID can carry a lot of information on your condition. Ask AF Association for a free anticoagulation alert card.

If you are on warfarin, take advice from your anticoagulation clinic on change of diet while travelling. Be aware of INR test centres or discuss with your doctor self-monitoring for INR while away.



Wearing flight socks (also known as compression stockings) during journeys of four hours or more helps blood flow and studies show that they can reduce swollen ankles and the risk of Deep Vein Thrombosis (DVT) significantly. They come in a variety of sizes and there are also different levels of compression. Flight socks are available from pharmacies, airports and many retail outlets. It's vital that compression stockings are measured and worn correctly because ill-fitting stockings could actually increase the risk of DVT. Take advice on size and proper fitting from a pharmacist or healthcare professional. With anticoagulation, your risk of developing a clot or DVT is low and there is no reason why you cannot travel, including long-haul.

Pack more medication than you will need on the journey in your baggage in case you get delayed or in case you need to extend your trip.

During the journey

- Take more medication than is required with you in your hand luggage in case of travel delays or loss
- Carry a list of medications and doses
- Carry a medication alert card or bracelet
- If you have a device fitted such as pacemaker, ICD, S-ICD or CRT device, ask airport security if it is safe for you to walk through the security scanners or whether you need to be manually searched/frisked
- Get up and stretch your legs regularly while travelling to reduce the risk of blood clots forming
- Do anti-DVT exercises at least every half an hour
- Raise your heels, keeping your toes on the floor, then bring them down again. Do this 10 times, then raise and lower your toes 10 times
- Carry water to counter the effects of dehydration
- Wear loose, comfortable clothes
- Wear your flight socks throughout the flight
- Drink alcohol in moderation or cut it out altogether, and avoid sleeping pills
- Follow advice on how to take medication if on long-haul flights with significant time changes



At your destination

- Keep as much as you can to your normal sleep pattern to avoid becoming over-tired
- Try not to exert yourself more than you usually do, pushing yourself too hard could trigger AF symptoms
- Stick to your normal diet as much as possible
- Alcohol and overeating can trigger AF
- Get immediate medical help if you have unusual AF symptoms

Enjoy your trip!

Driving with AF

Doctors should advise a patient with AF to contact the DVLA if you are in Britain, or DMV if you are in America, but it is a patient's responsibility to do so.

In general, reporting your AF is seldom an issue unless you are prone to experiencing unmanageable blackouts or severe symptoms which could impede driving ability. If you are an HGV driver or drive any other large vehicle which requires a special license, you will need to check with your local driving authority and your cardiologist whether you are able to drive and if any further tests need to be carried out.

Check the small print on your car insurance policy. Having AF should not restrict whether or not you can drive, but you should inform them of your diagnosis, and not disclosing this could render your policy invalid. If the terms of the policy are not beneficial to you, it might be time to change to another insurance company.

The official DVLA and DMV guidance for drivers is subject to change at short notice, and so their website will have the most up-to-date requirements or restrictions, including how soon you can drive after a cardioversion or catheter ablation. Please check the appropriate websites for guidance.



Key questions to ask your consultants

Causes of AF

- What is the cause of my AF? Do I need treatment for the causes, and will it stop the AF?
- Is there anything I can do to stop it or reduce the episodes?

Lifestyle

- Can I exercise safely? What exercises will be most beneficial to me?
- Do I need to change my diet? Are there certain foods or drinks I should avoid?
- What do I need to tell the DVLA/DMV & insurance companies?
- How will taking an anticoagulant affect my lifestyle, work or other commitments?

Medication

- Do I need to take an anticoagulant? Which anticoagulant would be best for me – why is this?
- How will my AF drugs interact with my other existing medications?
- Are there any alternatives to the medications you are prescribing, and if so what are they? How can I be assessed for these?

Outlook

- What happens if I still feel unwell? When should I see or talk to my doctor?
- If I feel very unwell I normally go to A&E/ED. Is this the appropriate thing to do?
- Is there an operation to repair my heart and stop the AF?
- Should I consider cardioversion or a procedure such as ablation? What are the risks and benefits to the procedure?
- What should I expect during the recovery period?



Frequently asked questions

? Why do I have AF? I am quite fit and healthy in all other ways.

Individuals who are fit and healthy can develop AF. In these individuals two factors may be at play. One is the influence of genetics and the other the influence of exercise. It is increasingly apparent, particularly in young individuals, that family history can explain the development of AF. It has also become apparent that high levels of exercise can in fact enhance the risk of AF if the individual is otherwise predisposed.

Doctors would previously describe AF occurring under the sorts of conditions where no other heart disease was observed as 'lone AF'. However, awareness of the presence of lone AF has increased over time and its incidence may also be increasing.

? I have noticed the need to urinate has become more frequent. Is this a common symptom of AF?

This is a very common effect of AF and is related to what happens with a hormone that the atria (the smaller, 'upper' chambers of the heart) produce when AF occurs. It is nothing life-threatening but will often continue for a while after the AF stops. Then as the body resets those hormone levels, the need to pass urine more frequently settles down. This is all quite normal.

? My AF seems worse at night. Is this normal?

An account of AF starting at night is not uncommon. When an individual describes this pattern, one of the useful investigations may be an ambulatory ECG monitor (24-hour tape). Some of these patients are seen to have slow heart rates at night which may predispose the onset of fibrillation and under these conditions the implantation of a pacemaker may allow one to control the symptom very efficiently without much drug therapy or without an AF ablation, although these should also be considered, possibly as adjunctive therapies in conjunction with a pacemaker.





Why does my AF come and go when others have it persistently?

The pattern of the AF and the way it affects individuals differs.

In some people the attacks go on for short spaces of time then spontaneously revert to a normal rhythm. That is usually called paroxysmal AF. The reason that the attacks terminate as spontaneously as they do is often unclear.

However, other people will be found to be in AF which is there all the time. This is generally referred to as persistent AF. This might have started in some patients as paroxysmal AF that has now become persistent.

In some patients, an attack will just start and never cease, and that again is referred to as being persistent. Ongoing research is endeavouring to find out why it is that paroxysmal becomes persistent in some individuals and not in others.



Will having AF increase my risk of other conditions?

The main problem with AF is the risk of blood clot formation and the precipitation of stroke. It is obviously the most feared consequence, and therefore after discussion and, once appropriate tests have been completed, a proper judgment needs to be taken as to whether warfarin or another anticoagulant should be started.

The other problem with AF is that in the occasional patient it appears to cause heart failure and that again should be carefully considered. An echocardiogram is extremely useful in guiding consideration and treatment of that possibility.



If I would like to change to a NOAC (non-vitamin K antagonistic oral anticoagulant), what is the best way to go about it?

If a patient wants to consider changing from warfarin to a NOAC then they can approach their doctor and simply ask for their advice. There are some specific national guidelines on who is absolutely eligible for the NOACs - these are produced by NICE. If you fulfil those criteria, then there is no way a doctor can deny you one. Also, if you are on warfarin and you are not in the right range with the INR measurements over 60-70% of the time when it is measured, then the warfarin is not doing what it needs to do and a NOAC would almost certainly be better.

Equally, if you are unsure and just want to discuss it with your doctor then that is normally fine, and they are becoming more accommodating in prescribing these.



Cost is not normally the major factor now, although some geographical areas will have preferences on which NOACs they use. If the doctor is still reluctant then you should ask to be referred to a local cardiologist with a specialist interest in arrhythmias who can advise.



**I have been found to have AF and have few symptoms.
Do I actually need any treatment?**

In individuals who do not have any obvious or intrusive symptoms of AF, the main decision is whether or not they need to take anticoagulants (warfarin or a NOAC) to reduce their risk of stroke. Recent ESC guidelines and NICE no longer recommend aspirin as an AF-related stroke prevention measure unless there is a history of conditions such as coronary heart disease or heart attack.

Heart failure is also an effect of AF that may need treating even if your AF itself causes few symptoms. An echocardiogram will assess the pumping function of your heart. If your heart is not pumping as effectively as it should, your doctor may prescribe medications including ACE inhibitors, beta blockers and mineralocorticoid antagonists. In addition, high blood pressure has been found to be a contributor to heart disease and also AF. If diagnosed, this will need to be controlled, often with tablets.



Can I make AF better without medication or without having an operation?

With paroxysmal AF, it may well be that interventions such as decreasing alcohol intake, losing weight and generally increasing fitness and controlling blood pressure, are effective in controlling AF. Even if a lifestyle modification approach is considered as the first line strategy for symptoms, then this should not change a proactive medical approach in measures to reduce the risk of stroke with anticoagulants.

Having said this, it would be encouraged that there are lifestyle modifications in all patients with AF, as these are likely to lead to a better overall outcome in terms of quality of life and prognosis of whether or not other interventions are applied.





I have AF and would like to know how often my doctor should review the drugs that I am taking.

The assessment process for AF can be divided into three phases.

1. Recognition, diagnosis, and treatment plan
2. Therapy and assessment of therapy
3. Period of stability following more intense treatment

In the first and second phases of the management of the condition, relatively regular reviews by the doctor are normally the order of the day. Once the main treatments have been deployed, then a follow up at six or 12 months is usual. At the end of that period, if symptoms are controlled and appropriate antithrombotic plans are in place, follow up may not be required on a regular basis.



I have recently developed AF. Is it safe for me to carry on attending my keep fit classes and jogging twice a week?

In an individual developing AF, the first step in terms of getting a management plan is proper medical assessment. Once that has been achieved and appropriate medication has been prescribed and/ or interventions have been embarked upon, then physicians would generally encourage patients to return to full and normal activities and to maintain general cardiovascular fitness. Such a programme will provide the maximum long-term advantage to patients.

Accordingly, we would advise individuals to attend keep fit classes, pursue fitness to the best of their capabilities and if they were able to go out jogging, this would also be encouraged. The maintenance of normal weight, joint flexibility and muscular strength is important to global fitness.



Will AF affect my sex life?

People who have experienced heart problems can often worry about having sex. We know that people often reduce or stop having sex because they are frightened it may bring on further heart problems.

The bottom line is that exercise is good for the heart and sexual activity is just another form of exercise. So, opposite to peoples' worrying thoughts and fears, regular sexual activity can actually be good for our hearts!



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Useful contacts and resources

To find out more information about AF, please visit:

UK- www.afa.org.uk or call 01789 867501

USA- www.afa-us.org or call 843-415-1886

The AF Association has an online forum – Health Unlocked.

Feel free to join the conversation at www.healthunlocked.com/afassociation

UK:

Facebook: [@atrialfibrillation](https://www.facebook.com/atrialfibrillation)

Twitter: [@AtrialFibUK](https://twitter.com/AtrialFibUK)

USA:

Facebook: [@AtrialFibrillationAssociationUS](https://www.facebook.com/AtrialFibrillationAssociationUS)

Twitter: [@AtrialFib_US](https://twitter.com/AtrialFib_US)

AF Association hosts patient educational events and presentations by leading cardiologists, electrophysiologists and other healthcare professionals on a range of AF topics and it also gives patients an opportunity to ask questions and to talk to each other.

Regular patient support group meetings are held around the UK.

You can see our support group map at

www.heartrhythmalliance.org/aa/uk/support-groups



Sources of advice and information

- Your cardiologist or electrophysiologist (EP)
- Your GP/PCP
- A pharmacist
- Arrhythmia nurse specialist
- Anticoagulation clinic
- The internet
- Good bookshops
- Libraries

AF Association has a wide range of booklets and factsheets on atrial fibrillation. Our publications are accredited by the AF Association Medical Advisory Committee and are endorsed by the Department of Health. They are reviewed and updated regularly as developments occur in the medical field.

AF Association resources can form the focus of discussion at appointments with your GP/PCP or cardiologist. All our publications are available to download from our website www.afa-international.org

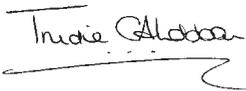
You can also view patient educational videos presented by AF experts here:

UK- www.heartrhythmalliance.org/afa/uk/videos

US- www.heartrhythmalliance.org/afa/us/videos

We are always happy to post publications to our members. These are normally free of charge, but we rely upon donations to cover production and postage costs, and these are always gratefully received.

“We want you to know that a diagnosis of AF does not mean that, once properly treated, your quality of life should be unduly compromised, and we wish you all the best for a long, happy and healthy future.”



Trudie Lobban MBE FRCP Edin.
Founder & CEO,
AF Association



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