

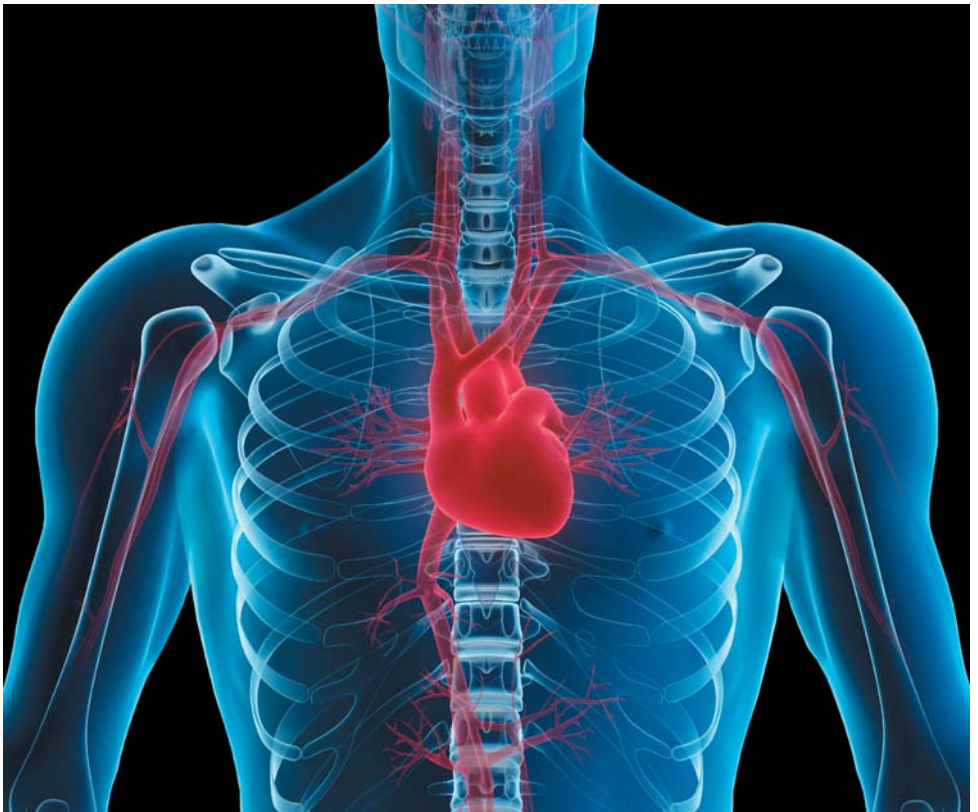


atrialfibrillationassociation

www.afa.org.uk

Providing information, support and access to established, new or innovative treatments for Atrial Fibrillation

CATHETER ABLATION FOR ATRIAL FIBRILLATION



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Glossary

Anti-arrhythmic drugs	Drugs used to restore the normal heart rhythm.
Anticoagulant	Drugs which help to thin the blood.
Arrhythmia	Heart rhythm disorder.
Arrhythmia Nurse Specialists	A nurse who is trained in heart rhythm disorders.
Atrial Fibrillation (AF)	Irregular heart rhythm.
Atrial Flutter	A rhythm disorder characterised by a rapid but regular atrial rate.
Cardiologist	A doctor who has specialised in the diagnosis and treatment of patients with a heart condition.

Catheter ablation	A treatment which destroys the areas inside the heart causing the AF.
Dyspnea	A medical term for shortness of breath.
Echocardiogram	An image of the heart using echocardiography or sound-wave based technology.
Electrocardiogram	A representation of the heart's electrical activity or ECG (sometimes EKG) in the form of wavy lines. An ECG is taken from electrodes on the skin surface.
Electrophysiologist (EP)	A cardiologist who has specialised in heart rhythm disorders.
Sinus rhythm	Normal rhythm of the heart.
Stroke	A medical condition which is now referred to as a "brain attack" where the brain is deprived of oxygen. Blockage of blood flow can be created when a blood clot breaks free, travels through the circulatory system and gets lodged in blood vessel long enough to cause a section of the brain to die. Strokes can vary in severity from transient (TIA) to very mild.
Tachycardia	A rapid heart rate.

Introduction

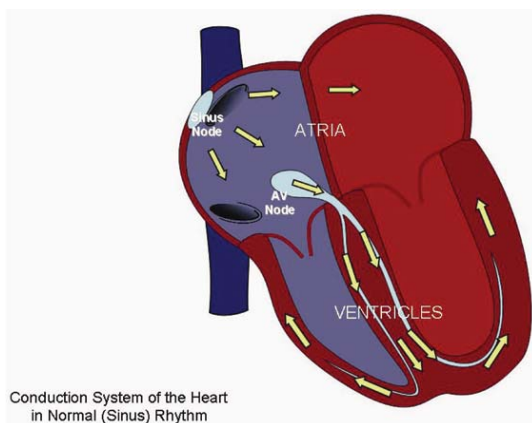
This booklet is intended for use by people who have had or are about to have a catheter ablation for Atrial Fibrillation. The information within this booklet comes from research and previous patients' experiences.

This booklet should be used in addition to the information given to you by doctors, nurses and physiologists. If you have any questions about any of the information given in this booklet, please ask your nurse, doctor, cardiac physiologist or pre-admission clinic.

The heart during normal rhythm (sinus rhythm)

The heart is a muscular pump which delivers blood containing oxygen to the body. It is divided into two upper chambers, or "atria", which collect blood returning via the veins, and two lower chambers or "ventricles", which pump blood out through the aorta (main artery) and to the lungs.

Normally, the heart beats in a regular, organised way, at a rate of 60-100 beats per minute. This is because it is driven by the "sinus node", an area of specialised cells which emit electrical impulses and is situated in the atria. These electrical impulses spread through the right and left atria in a smooth and uniform manner and then into the ventricles via a single connecting wire (the "AV node") as shown in the picture.

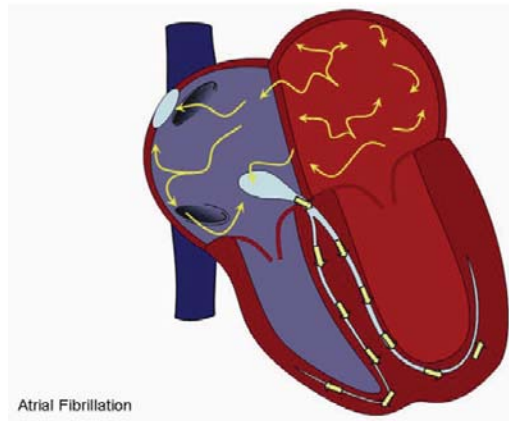


The sinus node is the body's natural pacemaker, triggering each heart beat according to the needs of the body. An example of this is during exercise, when the heart rate speeds up. When the heart is beating

normally like this, we refer to it as “sinus rhythm”, or “normal sinus rhythm”. For the heart to maintain sinus rhythm it needs both a normally working sinus node and for the cells of the atria be able to conduct the electrical impulses smoothly.

Atrial Fibrillation ‘AF’

During a burst of AF the heart beat is often rapid, irregular and of varying intensity. This can cause unpleasant symptoms of palpitations, light headedness, breathlessness, chest pain and may even lead to fainting.



If these episodes are intermittent then it is termed paroxysmal AF. In many patients however, the heart is in the irregular rhythm continuously when it may be termed persistent or permanent AF. In this situation patients also often complain of constant tiredness and lack of energy. AF occurs when the sinus node loses control of the heart rhythm. In paroxysmal AF this is due to other areas of the atrium producing rapid, uncontrolled electrical impulses, often from the four pulmonary veins which bring blood back to the atria from the lungs. In permanent or persistent AF the cells of the atria do not conduct the normal impulses from the sinus node smoothly which causes them to break up and be discharged rapidly across the atrial surface in many different directions.

The end result in both situations is rapid and chaotic quivering of the atria. The connecting wire (the AV node) protects the lower (the ventricles) pumping chambers from going too fast, however it may conduct extra impulses and as a result the heartbeat can sometimes be very fast and erratic. Normal heart rhythm can often be restored either by using drugs or by resetting the heart with a shock (cardioversion), after you have been put to sleep with an anaesthetic. However AF often

returns at some time in the future. In some patients the symptoms of AF can be controlled with drugs that control the rate at which the ventricles beat (Digoxin, calcium channel blockers or beta blockers) combined with a blood thinner (usually Warfarin or Aspirin) to prevent a stroke. If these measures have failed your doctor may advise you to undergo an ablation procedure.

Am I suitable for an AF ablation?

Ablation for AF is not suitable or appropriate for everyone with AF. Currently AF ablation is reserved for those with intrusive symptoms that impact significantly on quality of life, are refractory to treatment with medication or where medical therapy is contraindicated because of other conditions or intolerance. At present ablation for AF has not been proven to make a person live longer or specifically reduce the risk of stroke associated with AF, but studies going on at the moment will hopefully answer these questions in the next few years. It is also true that AF can be managed with appropriate medication as and when required in some patients.

National guidelines issued by the National Institute for Health and Clinical Excellence (NICE 2006) relating to percutaneous radiofrequency ablation for Atrial Fibrillation can be accessed at:

<http://www.nice.org.uk/nicemedia/pdf/ip/IPG168publicinfo.pdf>

It is also important that your individual circumstances and suitability for AF ablation are discussed with your local cardiologist or electrophysiologist.

The ablation procedure

The aim of this procedure is to destroy or isolate the abnormal sources of electrical impulses that may be driving AF and to alter the tissue of the atria so that they transmit the impulses from the sinus node smoothly. This is achieved by performing ablation within the atria. Ablation means, freezing or burning the heart tissue. This is done using a long wire (catheter) threaded into the heart. Once the tissue is treated in this way it forms a scar which can no longer conduct the abnormal impulses.

This particular pattern of lesions used varies from specialist to specialist.

Paroxysmal AF, particularly if the episodes are only of short duration, is often caused by ‘trigger beats’. These beats usually come from the pulmonary veins (PVs), of which there are usually four, which drain blood from the lungs into one of the chambers of the heart called the left atrium (LA).

Research has shown that the LA is the heart chamber most closely linked with AF. Hence the ablation procedure targets the PVs, or more specifically, the junction between the PVs and the LA. By ablating at, or very close to, this junction, electrical activity cannot flow between the PVs and the LA, and so the trigger beats are either eliminated or prevented from causing AF. In essence, the cardiologist is attempting to ‘electrically isolate’ the PVs and hence this procedure is often referred to as ‘pulmonary vein isolation’, ‘wide area circumferential ablation’ or ‘left atrial circumferential catheter ablation’.

It is generally agreed amongst cardiologists that PV isolation is very important in curing paroxysmal AF but there are different ways of achieving this isolation. Some cardiologists will ablate all of the way around the junction between the PV and LA, whilst others may target just specific areas of electrical connection between the LA and PV. Although both approaches achieve the same result, ablating all the way around the PV junction tends to be more successful in preventing AF. This is probably due to the other abnormal electrical areas being destroyed within these wider areas of ablated tissue (see below). Occasionally, triggers for AF may originate in completely different areas of the heart, such as the right atrium. These areas can be ablated if identified and in some patients this will result in a higher chance of cure of AF.

Persistent AF is linked, not only to trigger beats, but also to more widespread electrical abnormalities within the LA (and occasionally right atrium). This means that any procedure to cure this type of AF involves more extensive ablation than that performed in patients with the paroxysmal form. It is generally agreed that, even for patients with persistent AF, it is still important to electrically “isolate” the PVs. This is done as described above. However, following this, most cardiologists will then perform further ablation as described below:

- (a) Ablation “lines”.
Ablation can be performed so that a “line” of burns is made within the atrium. This can prevent not only AF, but also other abnormal circuits (similar to AF) that can form in the heart.
 - (b) Ablation of electrical targets.
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Recent research suggests that there may be certain areas within the left and right atria which are responsible for the continuation of an episode of AF once it has started. It is often possible to record abnormal complex electrical activity from these areas, some of which may be located where particular nerves enter the heart. Ablation in these areas has been shown to be effective in preventing AF in some patients.

The actual tools that are used to perform AF ablation may vary between different hospitals. Most centres use an ablation catheter; which is a wire that can be manipulated around the heart, the tip of which is then heated through radio frequency energy to ablate (destroy) the abnormal electrical connections. Others may use catheters which freeze, rather than burn, abnormal tissue. Miniature “balloons” also exist that can be positioned at the entrance of the PV, through which electrical isolation may be achieved by freezing or laser therapy. Also many centres are trying new patterns of lesions to see if they are more effective in preventing the return of AF.

Your specialist will discuss their particular technique with you.

Which is the best procedure to have?

Unfortunately this is an impossible question to answer at the moment. Generally, the more areas that are ablated within the atria, the less likely AF is to recur. However, this must be balanced against potentially damaging the function of the heart (specifically atria) by doing too much ablation. Furthermore, it is likely that the electrical abnormalities that cause AF may differ between patients, and unfortunately it is often difficult to pinpoint the specific cause in an individual patient. However, it is generally agreed by cardiologists that the PVs play an important role in the majority of patients with AF and therefore nearly all ablation strategies today will involve electrical isolation of the PVs. There is less agreement amongst cardiologists on the importance of the additional ablation strategies described above, except to state that, in most cases, additional ablation other than PV isolation will be necessary in patients with the persistent form of AF. Therefore, in this group of patients, this will currently consist of performing ablation lines or targeting specific sites, or a combination of both of these approaches.

What happens before the procedure?

Before your admission to hospital you may be invited to a pre-admission clinic with a nurse specialist or other clinical professional who will run through all the aspects of the procedure with you. This is a good time to ask any questions you may have. You can also finalise where and when you need to attend the hospital for your procedure, plus whether you need to fast (avoid anything to eat or drink) prior to admission. You will also be given instructions regarding your current medications such as which to stop and when. You must follow these instructions carefully as it may be necessary to cancel your operation if this is not done correctly, particularly instructions regarding blood thinning drugs such as warfarin.

If you are taking Warfarin this may be continued or stopped just before the procedure. For the few days while you are not taking Warfarin it may be necessary to inject yourself with another blood thinner such as Fragmin or Heparin, a partner or friend will need to be shown how and when to give these injections. There is no uniform policy regarding how to manage your blood thinners prior to AF ablation, your specialist will advise you of the local arrangements.

To assist with the procedure it may also be necessary to have a detailed scan of the heart such as a CT or MRI scan. These may provide useful information about the atrial chambers and pulmonary veins, which can make the procedure easier. You will be admitted to hospital either on the day of or the day before your procedure. A final run through of the procedure will be made by your consultant, specialist nurse or senior specialist trainee under the supervision of your consultant and then you will be asked to sign a consent form that states the benefits and risks of the procedure.

Prior to the ablation it may also be necessary to perform a transoesophageal echo (TOE), to ensure there is no blood clot in the atria, which would make it very dangerous to proceed. You are asked to swallow a thin tube with an ultrasound probe at its end so that the atrium and heart valves can be seen in great detail. Usually local anaesthetic will be sprayed at the back of your throat and you will be sedated to make this procedure as comfortable as possible.

What happens during the procedure?

Catheter ablation is carried out in a cardiac catheter laboratory, a room which is similar to an operating theatre. The procedure may be performed under sedation and local anaesthetic or a general anaesthetic, depending on the local policy. This means that you may be conscious, but you can be given medicines to prevent pain and to make you drowsy. There will be a team of people present, some of whom you may have met before. The doctor, (or electrophysiologist), will carry out the procedure with the help of a physiologist (cardiac technician), who gives technical support, nurses, who will look after you and assist the doctor and a radiographer who will assist with 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 both groins 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. In addition, it is usual to be given some sedation or pain killer intravenously via a fine tube or 'drip' in your hand or arm. This should help you feel relaxed and sleepy. You may even go to sleep during the procedure.

You may be asked to lie with your arms by your side during the procedure. If so, you need to ask the staff to scratch your nose, if need be, or move things for you so that you do not disturb any of the equipment by lifting your arm 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 in to 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 “transeptal 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 pain killer. Throughout the procedure a nurse will be monitoring you closely and he/she will always be available if you need anything such as pain killers or sedation. The procedure may take between 2½ and 5 hours. At the end of the procedure your consultant may wish to cardiovert the heart back into its normal (sinus) rhythm by delivering an electrical shock across the heart. If this is necessary you will be given more sedation so that you are asleep.

What happens after the procedure?

Immediately after the procedure you will be returned to the ward where your heart rhythm and your blood pressure will be monitored closely, as will any puncture sites in your groin and neck.

The tubes in your groin and neck will be removed either in the cardiac catheter laboratory itself or on the ward when it is safe to do so. It is usual to be discharged home the next day, again with instructions regarding blood thinners and heart rhythm medications – follow these carefully. Fleeting pains in the chest, shoulder, or neck, that catch the breath like a “stitch” are quite common in the first few weeks and are related to inflammation from the scar process.

These symptoms should settle quite quickly, often responding to simple painkillers such as paracetamol. If these pains continue for a longer period of time or if you become very breathless after the ablation you should contact the centre that performed your ablation for advice.

Most patients recover quickly from the procedure however it may take a day or two to feel completely normal again, partly as a result of the sedative drugs or general anaesthetic used. Recovery from the procedure will vary a little from one individual to another, but most normal daily activities can be resumed as soon as you feel able. It is best to avoid heavy lifting and strenuous exercise such as going to the gym for at least a week to allow your groin to heal properly. Although there are no formal rules, it is generally advisable to avoid flying for at least 1 week after an AF ablation too.

The DVLA currently state that you may not drive for two days following a successful ablation (six weeks if you carry a HGV licence) but your Consultant will probably recommend that you avoid driving for one week to allow the catheter insertion sites to heal fully (see DVLA website or check in the hospital for current guidance).

You can access the DVLA guideline on:

<http://www.direct.gov.uk/en/motoring/driverlicensing/medicalrulesfordrivers>

It is common to be aware of extra or missed heart beats in the first few weeks however if you experience a prolonged bout of palpitations (longer than 60 minutes) you should try to obtain an ECG during an episode and contact the centre that performed your ablation for further advice. Prolonged bouts of palpitation do not necessarily mean that your ablation hasn't been successful; some people may even require a cardioversion in the early stages post ablation, but any decision about the need for further ablations will generally not be made until at least 2 to 3 months after the first one. You should be given a phone number so that you can ring for advice if you run into any difficulties.

It may be useful to write down your local contact number here:

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

- Heart rhythm tablets: If the procedure is successful it should be possible 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 the normal rhythm again. In some situations these drugs may also be controlling another problem such as blood pressure (eg beta blockers) in which case you may be advised to continue them.
 - Warfarin: If you were taking a blood thinner before the procedure you will need to continue this for a period of time afterwards, depending on your local hospital. Even if your heart stays in sinus rhythm your specialist may still advise you to continue to take Warfarin for longer because it may still reduce your chance of having a stroke in the future. The circumstances for each patient are different and you will need to discuss this with your specialist.
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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 including the type of AF you have (paroxysmal or persistent), the length of time you have had AF, whether or not you have any other heart disease, the experience and the equipment available to the institution where you have the procedure performed. You should discuss these issues with your heart rhythm specialist.

Although reported figures vary, overall AF ablation is generally quoted to be successful in 80-85% of people with paroxysmal AF and approximately 70-75% in those with persistent AF. However to achieve this level of success it may be necessary to undergo 2 or 3 procedures.

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, which is recognised to occur in a small proportion of patients in who the fibrillation is abolished but the ablation lesions promote this more organised rhythm disturbance. Recurrence of AF can occur as a result of the small burns (radio frequency lesions) not fully forming scar tissue which results in the pulmonary veins and other affected areas being able to conduct the abnormal electrical impulses again. This is often termed as 'pulmonary vein reconnection'. Some patients will need to continue to take medication to control the AF after the ablation, but this is normally in patients where the AF was previously uncontrollable before the ablation.

Are there any risks associated with the procedure?

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. 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. The very serious complications are listed below. They are fortunately unusual. Overall there is a serious complication rate of between 2-4%, depending on your local centre.

More detailed information regarding the rate of complications associated with AF ablation can be found in the AFA Complications of Atrial Fibrillation Ablation patient information booklet.

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 blood thinners used to prevent blood clot formation may also contribute to the bleeding risk. A rapid 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 disturbance. The diagnosis is confirmed by performing an ultrasound scan (echocardiogram). Small effusions usually don't require treatment but if tamponade occurs 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. Blood thinning medication is often 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 drain 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. It was

more common when the ablation technique involved burning 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. Typical symptoms of PV stenosis include breathlessness, cough and haemoptysis (coughing-up blood).

The diagnosis is made using MRI or CT scans and nuclear perfusion scans. PV stenosis can be treated by a procedure called angioplasty where a small balloon is inflated in the vessel to reopen it.

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 air bubble this may be pumped into the head and block a blood vessel. To minimize this risk great care is taken during the procedure and blood thinning medication (Heparin) is infused to reduce the risk of clot formation. Most cardiologists also thin the blood with Warfarin for a period of at least a few weeks after the ablation whilst the inflammation in the left atrium is settling down. The risk of stroke is possibly also affected by age, the extent of the ablation procedure and also the individual patient's other medical problems. As the brain is essential for all bodily functions, damage to it can be variable. The effects of a stroke may be very short-lived (if a complete recovery is made within 24 hours it is called a transient ischaemic attack or **TIA**); last for days or weeks before full recovery; leave a permanent disability or even cause death. The physical effects can manifest as visual problems, difficulty with speech, altered sensation or function in the limbs and in the worst cases, paralysis and coma. Strokes are diagnosed using CT or MRI brain scans and may be treated by specialist teams.

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 blood thinning required after an ablation may contribute to its occurrence. It is usually painful and a lump (which may feel pulsatile) can 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 to sew up the hole may be required.

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 blood-thinning 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, which 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. An **atrio-oesophageal fistula** is when a hole occurs between the back wall of the left atrium and the oesophagus (food pipe), as a result of the heat of the ablation treatment. It is a very rare and extremely serious complication. Signs and symptoms appear a days to weeks after the ablation and are typically fever, chills, stroke, septic shock (collapse), haematemesis (vomiting blood) and unfortunately in most cases, death. The diagnosis is made using a CT scan or special X-ray. Treatment is difficult and often involves major chest surgery.

Phrenic nerve palsy The phrenic nerve controls the diaphragm, one of the important muscles involved in breathing. There are two phrenic nerves, one supplying 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 atrial fibrillation and this is known as phrenic nerve palsy. Phrenic nerve palsy is seen more commonly with cryoablation than radiofrequency ablation. During cryoablation of the right sided pulmonary veins, the function of the phrenic nerve is monitored continuously so that ablation can be stopped immediately if there are

warning signs of phrenic nerve palsy. Phrenic nerve palsy usually causes some degree of breathlessness. The diagnosis is confirmed by a chest x-ray. There is no specific treatment for phrenic nerve palsy. In most cases recovery is complete but can take up to a year.

Death is fortunately a very rare complication of catheter ablation. It could potentially result from a number of mechanisms including stroke, cardiac tamponade, myocardial infarction (heart attack), aortic dissection or atrio-oesophageal fistula. Extremely rare drug reactions or anaesthetic complications are also a remote possibility.

Are there alternative procedures?

There are alternative treatments for Atrial Fibrillation which have not been discussed in this leaflet. These are:

- **Pacemakers:** Where the AF causes a significant slowing of the heart rate a pacemaker may be used to maintain a more normal rate. However, it is more common for the heart rate to be fast with AF, and although some patients have had pacemakers implanted to try to control this, they are not very successful. If an AV node ablation is being planned (see below) it may be suggested that you have a pacemaker implanted first (as this will be needed after the AV node ablation anyway) and see if this does control the symptoms.
 - **Ablation of the AV node and a permanent pacemaker, 'pace and ablate':** This approach leaves the atria fibrillating but aims to control the way this affects the overall heartbeat (pulse) which comes from the ventricles. The electrical link between the atria and the ventricles is known as the 'atrioventricular node' or AV node. The AV node is responsible for transmitting the electrical impulses from the atria to the ventricles, and during AF it is this irregular, often rapid transmission that causes a lot of symptoms. AV node ablation involves destroying the AV node with heat (radio frequency ablation) in order to prevent these abnormal, irregular impulses being transmitted to the ventricles but in doing so the ventricles will usually contract at a very slow rate. Therefore, once the AV node is destroyed a pacemaker needs to be implanted to take over the heart rhythm completely. Ablation of the AV node cannot be reversed so people who undergo this procedure are dependent on a pacemaker for the rest of their life. A 'pace and ablate' strategy is most useful in those
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who suffer with moderate to severe palpitation and a high pulse rate when in AF. This procedure carries only small complication risks but is not suitable for everybody as permanent pacing of the lower chambers (ventricles) may not be good for long term heart pumping function.

- **Specific and strong heart rhythm drugs:** Drugs such as Amiodarone and Flecainide are used to keep the heart in its normal rhythm thereby aiming to minimise the episodes (paroxysms) of AF. Both drugs can also be used to return normal sinus rhythm when the heart has changed its rhythm to AF but does not revert back on its own. As with all medication, the side effects and its overall effectiveness vary from person to person. In addition these drugs are not suitable for everybody. There are new drugs in development for AF treatment and some drugs that are available in other countries but not in the UK. Your own specialist should be happy to discuss drug treatment options with you.
- **Heart surgery for AF:** In most circumstances this is reserved for those who need heart surgery for other reasons such as a heart valve replacement or coronary artery bypass grafts. These procedures involve direct visualisation of the heart rather than accessing it with catheters inserted into the groin. The complications and rates of complication with regard to heart surgery also differ. The original surgical approach, known as the Cox Maze procedure, involves making multiple, strategically placed incisions in both atria to isolate and stop the abnormal electrical impulse that cause AF, and there have been several modified versions of this procedure. More recently, the more common surgical approach is to create lesions in the atria by ablation using energy sources such as radiofrequency and cryotherapy (freezing) in a similar fashion to catheter ablation, but through surgical incisions rather than through the groin.

If you would like to explore these alternative options further you should discuss them with your heart rhythm specialist.

MEMBERSHIP APPLICATION FORM

Membership is free, however donations are gratefully received. Cheques should be made payable to AFA.
If you are interested in receiving further information, becoming a volunteer or fundraiser, please do not hesitate to contact us.

<p>PLEASE PRINT -</p> <p>Patient <input type="checkbox"/></p> <p>Title: Mr / Mrs / Miss / Ms / Dr _____</p> <p>Full Name: _____</p> <p>Address: _____ _____ _____</p> <p>Postcode: _____</p> <p>Daytime Telephone no: _____</p> <p>Evening Telephone no: _____</p> <p>E-mail: _____</p> <p>Date of Birth: _____</p>	<p>Carer <input type="checkbox"/></p> <p>Name: _____</p> <p>Tel: _____</p> <p>Email: _____</p> <p>Address: _____ _____ _____</p>	<p>Patient Diagnosed: Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Diagnosis: _____</p> <p>If Diagnosed by whom:</p> <p>GP <input type="checkbox"/> Cardiologist <input type="checkbox"/></p> <p>Geriatrician <input type="checkbox"/> Paediatrician <input type="checkbox"/></p> <p>Name: _____</p> <p>Hospital/Medical Centre: _____ _____ _____</p>
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Please remember these are general guidelines
and individuals should always discuss
their condition with their own doctor.

