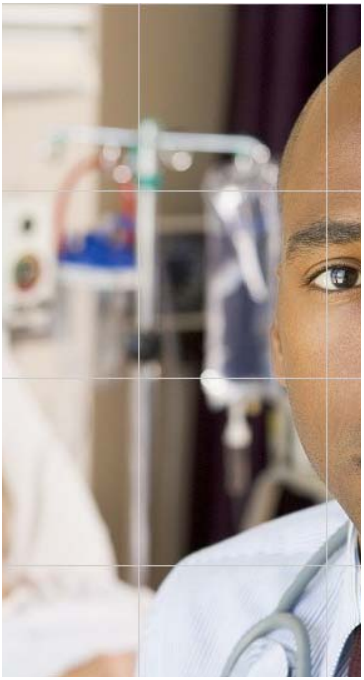
Arrhythmia Alliance

www.heartrhythmalliance.org

Treatment options for an arrhythmia



Working together to improve the diagnosis, treatment and quality of life for all those affected by arrhythmias

Glossary

Ablation A minimally invasive treatment involving identifying the cause of the arrhythmia and making a very small burn inside the heart, offering a chance of a cure

Anticoagulants Drugs which help to thin the blood, and reduce the risk of blood clots in the circulation

Arrhythmia Irregular or abnormal heart beat that may be excessively fast or slow

Atria The two upper chambers of the heart

Atrial Relating to the upper chambers of the heart

IMPORTANT INFORMATION

Heart rhythm disorders, or arrhythmias, can be treated in a variety of ways. Some require no more than reassurance after diagnosis, but others may need drug therapy, implantation of an electrical device such as a pacemaker or ICD, internal treatment (ablation) to remove an abnormal circuit (a focus or pathway) within the heart or even a combination of treatments. The correct treatment for your particular problem will have been discussed with you by your cardiologist or arrhythmia nurse; this booklet will attempt to answer any queries or concerns that you may have with regard to drug treatment for arrhythmias. Other booklets are available from Arrhythmia Alliance on device therapies and internal treatments.

Contents

AV node The electrical connection point between the atria and ventricles

Cardiologist A doctor who has specialised in the diagnosis and treatment of patients with heart conditions

Catheter A long, thin, flexible tube or wire that is put into a blood vessel and threaded to your heart

Electrophysiologist A cardiologist who has specialised in the electrical aspects of the heart, meaning the heart's rhythm

Implantable cardioverter defibrillator (ICD) A small device implanted in your chest, connected to the heart, that regulates your heart rhythm if it becomes abnormal

Paroxysmal AF Atrial fibrillation that spontaneously settles

Prolonged QT interval Delayed recovery of the heart beat as reflected on the electrocardiogram (ECG)

Sinus node This is the natural pacemaker of the heart

Supraventricular Tachycardia (SVT) A term given to a variety of abnormal heart rhythms arising from the upper chambers of the heart

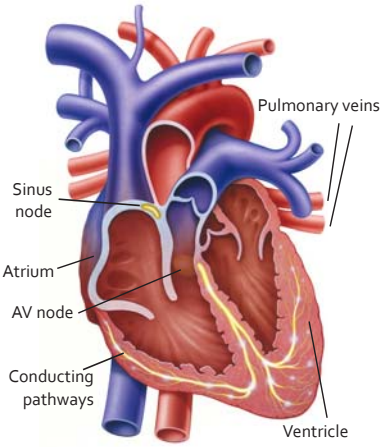
Tachycardia Fast heart beat of more than 100 beats per minute

Torsade de pointes A specific form of ventricular tachycardia in patients with long QT syndrome that can be life threatening

Ventricular Relating to the two lower chambers of the heart

The normal electrical system of the heart

The heart has its own electrical conduction system which sends signals throughout the upper (atria) and lower (ventricles) chambers of the heart to make it beat in a regular, coordinated rhythm. The conduction system consists of two areas called nodes that contain conduction cells and special pathways that transmit the impulse. The normal heartbeat begins when an electrical impulse is fired from the sinus node (SA node), in the right atrium. The sinus node is responsible for setting the rate and rhythm of the heart and is therefore referred to as the heart's natural 'pacemaker'.



The electrical impulses fired from the SA node spread throughout the atria, causing them to contract and squeeze blood into the ventricles. The electrical impulse then reaches the atrioventricular node (AV node), which acts as a gateway, slowing and regulating the impulses travelling between the atria and the ventricles. As the impulse travels down the pathways into the ventricles, the heart contracts and pumps blood out of the heart around the body. The cycle then begins all over again.

The normal adult heart beats in a regular pattern 60-100 times a minute; this is called sinus rhythm.

What are arrhythmias?

Arrhythmias are disorders of your heart's electrical system whereby there is a change in the regular beat of your heart. Sometimes if the conduction pathway is damaged or becomes blocked, or if an extra pathway exists, the heart's rhythm changes. The heart may beat too quickly (tachycardia), too slowly (bradycardia), or irregularly, which may affect the heart's ability to effectively pump blood around the body. These abnormal heart rhythms are known as arrhythmias. Arrhythmias can occur in the atria or the ventricles. Arrhythmias may occur at any age, and are most often a nuisance rather than a serious problem.

What happens in the heart to cause an arrhythmia?

Any interruption in the heart's electrical system can cause an arrhythmia. For example, an irregular heartbeat may begin with an abnormal impulse in a part of the heart other than the normal pacemaker (the sinus node); or the sinus node may develop an abnormal rate or rhythm.

What can trigger an arrhythmia?

Common causes of arrhythmias include electrical variations that people are born with, which may only become a problem in adult life. Certain triggers can include stress, caffeine, tobacco, alcohol, diet pills, and cough or cold medicines, but there is usually an underlying physical reason for the arrhythmia. If your heart tissue is damaged as a result of acquired heart disease such as myocardial infarction (heart attack), or congenital heart disease, you may also be at risk of developing arrhythmias. In rare cases, it may be that doctors cannot identify a cause of the arrhythmia.

How are arrhythmias treated?

The results of the tests you have had will determine the type and seriousness of your arrhythmia, and your doctor will then discuss with you the treatment options available. You and your doctor will then decide which one is right for you. Remember, many patients with arrhythmias require no further treatment.

The most important aspect of any initial evaluation is to determine the significance of the arrhythmia and the need for any type of intervention. This booklet discusses medications for arrhythmias, and other treatments including cardioversion and minimally invasive surgery such as ablation. We have further information available about the implantation of medical devices, such as pacemakers or internal cardioverter defibrillators (ICDs).

Arrhythmia Medications

Just as there are many different antibiotics to treat different infections, there are a number of different drugs to treat arrhythmias. These drugs tend to be grouped into classes, according to how they act on your heart, but drugs within the same class may affect different people in different ways. All of these drugs, however, are prescribed with two main objectives in mind:

What do the drugs do?

1. To suppress your arrhythmia, maintain a normal heart rhythm, and hence minimise your symptoms.
2. To prevent the development of prolonged or serious rhythm disturbances that might result in collapse, stroke or death.

As a general rule, most serious (life-threatening) arrhythmias are treated with an implantable device such as an implantable cardioverter defibrillator (ICD) or ablation, but some patients may need to take medication in addition.

Before commencing a drug (or drugs), your doctor should explain how many tablets you need to take and any likely or possible side effects that you might experience. All drugs have some side effects, and these side effects vary from patient to patient.

The treatment you are prescribed is very often a compromise between the risks and symptoms associated with your arrhythmia and the side effects of your treatment. If you have side effects that you feel are not tolerable, you should report them to your doctor, as they may be able to offer another drug that suits you better.

You should not stop taking the tablets suddenly without contacting your doctor as this may result in a 'rebound' worsening of your arrhythmia. Occasionally, your GP/doctor may give you advice about making small adjustments in your dosage according to your symptoms or side effects. Do not vary outside any agreed variation as this may result in severe side effects or loss of benefit from the drug.

Can I take antiarrhythmic drugs if I get pregnant or wish to breastfeed?

Like most drugs, antiarrhythmic drugs should be used with caution during pregnancy or breast feeding. Although some drugs are quite safe, others should be avoided as they can have an adverse effect on a baby's development. If you are planning a pregnancy, you should mention this to your cardiologist or arrhythmia nurse. They will be able to advise you what is the safest option. Your pharmacist might also be able to give helpful advice. If you have an unplanned pregnancy, it is important to seek medical advice straight away as there may be a safer alternative drug for you to take.

What about other medication interactions?

Because arrhythmias often (but by no means always) occur in association with other heart conditions, you may well be on a number of drugs. These drugs are necessary and contribute to controlling your arrhythmia by treating the underlying heart problem, so must be continued. This may mean that you are taking a complicated 'cocktail' of drugs and it can be hard to remember which tablets to take and when.

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

It is also worth checking your tablets every time you have a new prescription – pharmacists occasionally make mistakes and sometimes your tablets may look different because they have come from a different manufacturer (even though the drug is the same).

What if I feel really ill with my medication?

Contact your doctor (ring the surgery or hospital and ask for his/her secretary) BEFORE stopping any medication, as sudden cessation of treatment can sometimes result in an unpleasant return of your arrhythmia, perhaps worse than before treatment. Your doctor will either see you quickly or give advice about what to do. If you feel very unwell and are unable to contact your GP/cardiologist, you should consider attending your local Accident and Emergency Unit, taking all of your tablets with you.

Some drugs used for arrhythmias stay in the body for quite a long time after stopping them, so any side effects may take a while to diminish or disappear. Amiodarone (Cordarone X) is the most common antiarrhythmic drug that is associated with this problem; it takes many weeks to reach stable levels in the body and may take at least three months to be removed from your body once stopped. This means, of course, that changes in dose will take some time to take effect as well as side effects continuing for some time after stopping the drug. Most other drugs are not as persistent as this, but it may take several days for a change in dose to have effect.

IF IN DOUBT, CONTACT YOUR GP, CARDIOLOGIST OR ARRHYTHMIA NURSE.

Drug treatment options

Anticoagulant therapy

In atrial fibrillation (AF), the chaotic electrical activity means that the atria no longer contract together, but instead the muscles quiver like a bag of worms. A lack of efficient contraction means that the blood within the atria becomes stagnant and can form clots. These clots can travel anywhere in the body, but most worryingly, they can travel to the brain and cause a stroke. The risk of stroke in AF is five times greater than in normal sinus rhythm. This is why people with AF may need to take anticoagulants, to reduce the risk of clots forming, and thus reduce the risk of stroke.

Anticoagulation is the process of preventing blood from clotting. A blood clot contains two sticky materials: small structures called platelets, and a protein called fibrin. Anticoagulants stop the formation of fibrin, that binds together to form clots. Oral anticoagulants can prevent two out of three AF related strokes.

Anticoagulant options

Warfarin

Warfarin is a very effective anticoagulant tablet, and is the most commonly used vitamin K antagonist (VKA). VKAs work by interfering with how your liver uses the vitamin K in your diet, and is also affected by the amount of vitamin K in your diet. It acts on the liver to prevent the formation of proteins that go on to create fibrin, therefore preventing blood clots from forming.

Regular monitoring with blood tests is needed while taking Warfarin, to measure the blood's clotting capability, which is called INR (International Normalised Ratio). By measuring the INR, anticoagulant clinics and healthcare teams can optimise the dosage given to a patient. Too little Warfarin reduces the therapy's ability to prevent an AF-related stroke, but too much Warfarin can put you at an increased risk of bleeding.

Non-vitamin K antagonist oral anticoagulants (NOACs)

NOACs work in a different way to prevent the blood from clotting. At the time of publishing, there are four NOACs currently available in Europe: Apixaban, Dabigatran, Edoxaban and Rivaroxaban. NOACs are proven to be safer than VKAs while being as effective, or even more so.

NOACs do not need regular 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.

Possible side effects associated with anticoagulants

Like all medicines, each anticoagulant may lead to individual side effects specific to that particular medicine. Some side effects include nausea, vomiting, bruising, confusion and constipation. If you think you are experiencing any unpleasant side effects, you should raise this with your doctor or pharmacist.

Anticoagulants and bleeding

Anticoagulants do not cause bleeding. Bleeding can occur from injury, or can develop internally. The role of anticoagulants is to prevent potentially dangerous clots from forming in the body, so if you are bleeding, it may take longer for the blood to clot. The risk of major bleeding in people taking anticoagulants is low, and can affect around 3 in 100 people a year.

For more information about anticoagulant therapy, please contact our sister charity AF Association at info@afa.org.uk

Amiodarone

Amiodarone is used to help keep the heart in its normal (sinus) rhythm. It is also used when the heart has changed its rhythm (arrhythmia) in order to help it return to normal rhythm. Amiodarone has a low risk of pro-arrhythmia (a new or more frequent occurrence of pre-existing arrhythmias) and is commonly used in patients with structural heart disease.

Side effects

Although generally well tolerated, amiodarone does have side effects that can affect many different parts of the body.

Skin

When taking amiodarone, the skin can take on a greyish/blue tinge. This will settle on stopping amiodarone. While taking amiodarone, you may become more sensitive to the harmful effects of sunlight. Using sunblock and hats appears to prevent this side effect. As amiodarone remains in the body for a long time, it may be necessary to continue using sunblock for a few months after stopping amiodarone.

Thyroid Gland

The thyroid gland produces a hormone which controls the body's metabolism. Amiodarone can affect this gland, making it both over active (this occurs in about two percent of people taking amiodarone) or under active (this occurs in about six

percent of people taking amiodarone). Your doctor will take regular blood tests to check if either of these has developed. If you experience symptoms of extreme tiredness or restlessness you should contact your GP. The doctor may wish for you to have a blood test if this has not been recently performed. Both an overactive and underactive thyroid can easily be treated with medicines.

Eyes

Small deposits can form in the cornea of the eye (the clear surface that covers the pupil, iris and white of the eye). These deposits are not harmful. However, you may notice the effect of these eye deposits if looking at bright lights at night e.g. when driving a car. Of people taking amiodarone, one in ten will experience a bluish halo around their vision. Again, this is not harmful. You should check with your doctor if you need to inform the DVLA if these deposits cause visual impairment.

Lungs

Amiodarone can cause problems with thickening (fibrosis) of the structures of the lungs. If you feel you have problems with shortness of breath then you should arrange to see your GP.

Liver

On rare occasions, amiodarone causes problems with the function of the liver. Your doctor will check for any effect on the liver when performing routine blood tests every six months.

Monitoring

Amiodarone is a very useful medication and will only have been commenced in your clinical best interest. The effects listed above, although not universal, do mean that monitoring is important.

You will be reviewed by your GP every six months whilst on amiodarone. They will need to arrange blood tests to ensure that your thyroid and liver function is normal and ensure that you are displaying no other problems. Do remember, however, that this drug can be a life-saver when used carefully and correctly and so, as with other antiarrhythmic drugs, should not be stopped or the dosage changed without consulting your GP/doctor.

Atenolol

Our heartbeat is regulated by special cells that conduct electrical impulses. An irregular heartbeat can be caused by these cells conducting electrical impulses too quickly. Atenolol, which is a beta blocker, reduces the activity in these cells and so helps the heart to beat more regularly and slowly. Beta blockers protect the heart from the effects of adrenaline, slowing down the activity of the heart muscle, which also reduces blood pressure.

Common side effects associated with atenolol are nausea, blurred vision, vomiting, cold hands or toes, light headedness, shortness of breath, fatigue, and sexual problems. Beta blockers may not always be safe for patients with asthma. Patients with asthma should highlight this to their doctor if they are to be prescribed beta blockers. If you experience any of these side effects, please speak with your doctor or pharmacist.

Considerations of Atenolol

Ensure that your doctor or pharmacist is aware if you are pregnant, trying for a baby or breast feeding. If you are taking any other medications, please make sure that your doctor is aware of this before commencing the treatment. Beta blockers can interact with other medications causing alterations in the way that each drug works.

Bisoprolol

Bisoprolol is another beta blocker and is used to slow an abnormally high heart rate. Beta blockers protect the heart from the effects of adrenaline, slowing down the activity of the heart muscle which also reduces blood pressure. Bisoprolol is used to treat hypertension (high blood pressure), angina and in some cases heart failure, due to the protective effects it has on the heart from adrenaline stimulation.

Side effects

As with all medications, there are possible side effects. Although not everyone experiences side effects, those known that can occur are: dizziness/ light headedness or feeling faint, sickness or nausea, diarrhoea, tiredness, hypotension (low blood pressure) or bradycardia (slow heart beat). If you are asthmatic, this should be highlighted to your prescribing doctor. It is important to speak to your doctor if you experience any side effects from medication.

Considerations

Bisoprolol can interact with other drugs, ensure that your doctor or pharmacist is fully aware of all the medications you are taking.

Dronedarone

Dronedarone is a drug that is similar to amiodarone in structure, but has modifications to make its metabolism more clinically useful and reduce the chance of thyroid problems. Its main mechanism of dampening atrial excitability (the ability of the cell to respond to an electrical impulse) has been shown to reduce AF-related hospital admissions in a large, randomised clinical trial. Dronedarone should be initiated and monitored by an appropriate hospital consultant or specialist nurse practitioner.

Contraindications

An increased incidence of heart failure has been seen with exposure to this drug, therefore dronedarone should not be prescribed to patients with heart failure or

impaired heart function, and monitoring should be carried out in all those using it. Dronedarone should also be avoided in patients with significant liver disorders.

Guidance on monitoring has been issued by the Medicines and Healthcare Regulatory Agency(MHRA). Patients with heart block, or sick sinus syndrome (unless used in conjunction with a functioning pacemaker), or corrected QT interval >500ms should not be given dronedarone.

Side effects

Dronedarone is generally well tolerated but common side effects are diarrhoea, abdominal discomfort, nausea and vomiting. There is an increased incidence of skin rash and bradycardia. Most side effects resolve within the first two weeks after drug commencement, but in a proportion of patients, dronedarone may need to be discontinued because of intolerance.

Flecainide

Flecainide slows conduction in cardiac cells, decreasing their excitability; both preventing and in some circumstances terminating atrial fibrillation (AF). It also slows conduction in the accessory pathways responsible for Wolff Parkinson White (WPW) syndrome that can be associated with AF. Flecainide is especially useful in patients with paroxysmal AF without structural or coronary heart disease. In such cases, it must be used in conjunction with an agent such as a beta blocker or calcium channel blocker (verapamil or diltiazem), that slow the AV node to protect against rapid conduction to the ventricle.

Flecainide is metabolised in the liver with a half-life of around 14 hours so it is usually administered twice daily. In some patients with heart disease and in those with poor kidney function it can accumulate so dose reductions may be needed. Flecainide may be used in pregnancy following appropriate discussions and after consideration of other approaches.

Contraindications

Flecainide has a variable half-life and often causes ECG changes. The British National Formulary recommends that flecainide is only given on the advice of a

hospital consultant. Additionally, in patients with renal failure, blood levels also have to be monitored regularly. Flecainide is contraindicated in patients with sinus node disease, atrioventricular block or bradycardia (without pacemaker support) and it should also be used with caution in those who have received pacemakers.

Side effects

Adverse side effects are usually temporary and can include nausea, blurred vision, dizziness, constipation, diarrhoea and headaches. Occasionally flecainide may cause shortness of breath, skin irritation and chest pains. If you are concerned that flecainide is causing any problems, it is important to seek medical advice promptly.

Sotalol

Sotalol is a beta blocker, and as such is probably effective because it counteracts the arrhythmogenic effect of adrenaline and similar influences that may trigger attacks of arrhythmias including AF. Sotalol has other actions to make the atrial cells less excitable through blocking heart potassium channels, but only at high doses between 80mg - 120mg, twice per day, however side effects are common. This second action is beneficial in the atria but may have adverse effects on the ventricle, so the dose of sotalol should be increased with caution and with periodic ECG monitoring.

Cautions

Sotalol, by prolonging the recovery phase of the heart beat cycle, can predispose to ventricular arrhythmias (torsade de pointes) which can be risky, and may be life-threatening if there is a situation with low potassium and low magnesium levels, as with diarrhoea and vomiting. To minimise the likelihood of this problem, if there is evidence of renal impairment, the dose needs review and reduction.

Side effects

The main side effects from beta blockers in general are due to slowing of the heart and depression of the contraction of the heart. Accordingly, bradycardia or symptoms of heart failure can result in other effects including fatigue, sleep disturbance, shortness of breath, sexual dysfunction and depression.

Interactions

Associated intravenous administration of a calcium channel blocker that affects conduction (verapamil, diltiazem) increases the risk of bradycardia and should in general be avoided. If you are asthmatic, this should be highlighted to your prescribing doctor.

Verapamil

Verapamil is a calcium channel blocking drug that is used to slow the heart rate. Verapamil works in treating arrhythmias by stopping calcium entering the cells of the heart, slowing abnormally fast heart rates. Reduced amounts of calcium entering the muscle cells of the heart also relax the arteries and improve blood flow which lowers blood pressure. Due to this effect, verapamil is used to treat angina and hypertension (high blood pressure).

Side effects

As with all medication, there are possible side effects. Not everyone will have side effects, but when taking this medication you may experience constipation, dizziness, headaches, feeling nauseous or being sick, and swollen ankles.

If any of these symptoms become problematic it is important to see your doctor.

Considerations

It is advised that you DO NOT drink grapefruit juice whilst taking verapamil as this can increase the effect of the drug and you are more likely to experience side effects. Verapamil should not be used with beta blockers. Patients should have regular blood pressure and heart rate checks whilst on this medication. In all matters regarding medication, your doctor will advise you on what is right for you.

Midodrine

Midodrine is a drug that can be used to treat people with disorders such as low blood pressure, syncope (fainting) and postural tachycardia syndrome (PoTS). It is only used after other self-help measures have been ineffective in controlling symptoms.

Side effects

Some common side effects of midodrine include tingling and itching of the skin, goose bumps and feeling cold. Less common side effects include supine hypertension (high blood pressure on lying down), urinary retention, palpitations or irregular heart rhythm.

Interactions

Midodrine should be used with caution in combination with digoxin, beta blockers, steroids, thyroid hormones, appetite suppressants, tricyclic antidepressants among other medications.

For more information about midodrine, please contact our sister charity STARS at info@stars.org.uk

Cardioversion

What is a cardioversion?

A cardioversion is the conversion of an abnormal heart rhythm to normal rhythm. Cardioversion may be achieved by rhythm control medications (antiarrhythmic drugs) by mouth or through medication administered intravenously (through the veins). However, an electrical shock treatment, which at first sounds rather frightening, is usually the quickest and most effective treatment. Under a general anaesthetic or heavy sedation, an electrical current is used to restore normal heart rhythm (sinus rhythm). This is a simple and highly effective treatment that is used for both AF and atrial flutter.

Electrical Cardioversion

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

The procedure

In the cardioversion unit, the patient will meet the nurses and doctors involved with the procedure. The cardioversion procedure will again be explained in detail, and a consent form may be completed by the person performing the treatment. 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 anaesthetist room. The cardioversion itself involves connecting the patient to an ECG monitor, which in turn is connected to the cardioverter/ defibrillator. Electrode patches are positioned on the back and front 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 heart beat. Often, the first shock is successful, but sometimes several shocks at increasing energy levels, or with different electrode patch positions are needed to convert the rhythm.

Normal sinus 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 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.

A friend or partner should come to hospital with the patient, as they cannot drive for 24 hours after the procedure, and should be accompanied home. Someone should also stay with them on the night after the procedure in case they have a complication.

Risks of cardioversion

- Slow heart rhythm (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 rhythm (such as ventricular tachycardia)- may need a follow up shock before the patient regains consciousness.
- Stroke- this is very unusual if the patient has been fully anticoagulated before the procedure, or if the duration of AF is short, or if a TOE (trans-oesophageal 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 sedation/anaesthetic).
- General anaesthetic risks- the anaesthetist will address any patient-specific concerns.

For more information about cardioversion, please contact our sister charity AF Association at info@afa.org.uk.

Catheter ablations for cardiac arrhythmias

Sometimes, the electrical conduction system in the heart travels in a different direction due to extra electrical connections known as 'pathways', or due to extra electrical cells within the heart. Often these pathways are present at birth, but may only start to cause symptoms in adulthood.

When the heart has an extra beat (an ectopic beat), it can travel up the pathway and travel down the normal conduction system. If this continues, palpitations can start. This means that the heart suddenly starts to race, causing an awareness of a fast heartbeat. If the abnormal heart rhythm arises from the upper chambers of the heart, this is known as SVT, or supraventricular tachycardia.

This type of heart rhythm disturbance is not life threatening, but can cause unpleasant symptoms and interfere with your quality of life. If the abnormal heart rhythm comes from the lower pumping chambers of the heart (the ventricles), it can be dangerous, particularly if it is associated with fainting.

Catheter ablation aims to cure the abnormal heart rhythm by destroying the area of heart cells responsible for the arrhythmia without affecting the rest of the heart.

The ablation procedure

Catheter ablation is carried out in a cardiac catheter laboratory. The doctor, or electrophysiologist, will carry out the procedure with the help of a physiologist, who gives technical support. There will also normally be at least one nurse present, who will look after you and assist the doctor, and often a radiographer who will control the x-ray equipment.

Catheter ablation is a minimally invasive procedure, which is usually performed using local anaesthetic and sedation, although in some cases, such as in children or adolescents, a general anaesthetic may be used. If sedation is used, it makes you feel relaxed and you may go to sleep for a while, but you will still be able to respond to the doctor and nurses.

The Cath Lab (Cardiac catheter laboratory)

During the procedure you will be required to lie flat and still. Some local anaesthetic will be administered in your groin(s). Then one or more catheters will be inserted into a blood vessel underneath the skin, which has been numbed by the anaesthetic.

Each catheter is then passed along your blood vessels and directed to your heart; this is done with the guidance of an x-ray machine. Once the wires are positioned within the heart, extra beats are delivered using an external pacemaker, which may bring on your palpitations. This is necessary to see the area of the heart where the abnormal rhythm is coming from. It is possible to put the heart back into normal rhythm within a few seconds, by delivering some extra beats, under the control of the doctor and their team.

Once the abnormality has been found and if it is felt to be necessary, the doctor performing the procedure will begin to ablate the pathway or area of extra electrical cells. This is done by delivering a form of energy down the catheter wire to the target area within the heart. Most commonly the energy used is a heat source, called radiofrequency energy, but other types may be used such as cryotherapy, which freezes the area.

This part of the procedure may be a bit uncomfortable, so usually more sedation is given. Once the procedure has finished, the catheter(s) will be removed and you will spend a few hours recovering on the ward.

After the ablation

Most people recover quickly from the procedure and feel well enough to carry on with simple normal activities of daily life the following day. You should avoid heavy lifting and more strenuous exercise such as long walks or going to the gym for about 2 weeks afterwards. The DVLA currently state that you may not drive for two days following a successful ablation (six weeks if you carry an HGV licence) but your consultant will probably recommend that you avoid driving for up to one week to allow the catheter insertion site(s) to heal fully (see DVLA website or check in the hospital for current guidance). Time off work will depend upon your profession but often people will take one to two weeks off.

Following the ablation, it is quite common to be aware of your own heartbeat, even in normal rhythm. Some people are aware of extra or 'missed' beats. Try not to worry too much about these symptoms, which usually settle down with the passage of time. If you experience your palpitations or a racing heartbeat, you should report this to your doctor, as this may indicate that the procedure has not been completely successful. It is common practice for you to be seen in the outpatient clinic a few months after the procedure, to see how you are progressing.

Risks and benefits

One reason why it has become a popular treatment in recent years is that it has a very good safety record. However, risks include bleeding, infection, damage to normal electrical pathways of the heart requiring a pacemaker, and stroke.

The mortality risk of catheter ablation is believed to be < 1:2000 for most types of ablation. The benefit of having a catheter ablation is that your heart rhythm disturbance is potentially cured and your symptoms (palpitations, fainting, fatigue, breathlessness etc) resolved. This is possible in the vast majority of cases. Your local hospital will be able to give you exact figures, depending on the type of ablation and your individual case. A small number of individuals will need more than one session of treatment. There is no medical procedure with zero risk and catheter ablation is no exception. More specific risks and benefits will be discussed with you at your local hospital.

Arrhythmia Alliance

www.heartrhythmalliance.org

Working together to improve the diagnosis, treatment and quality of life for all those affected by arrhythmias

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Please remember that this publication provides general guidelines only. Individuals should always discuss their condition with a healthcare professional.

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If you would like further information or would like to provide feedback please contact Arrhythmia Alliance.