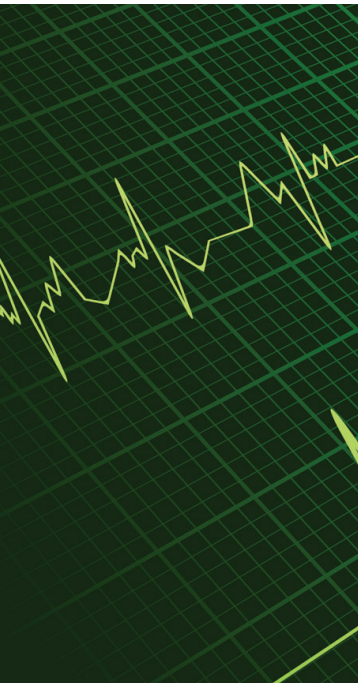
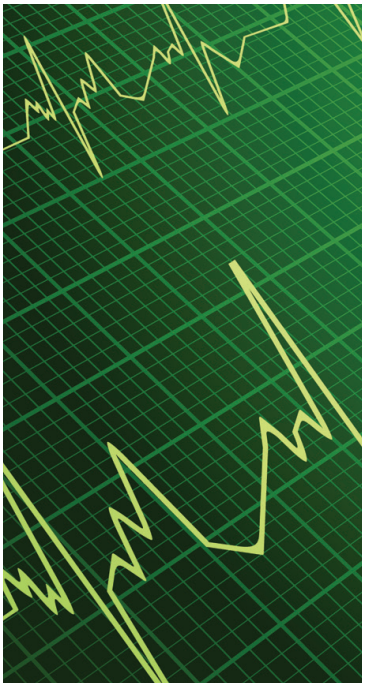
Arrhythmia Alliance

AFAssociation

www.heartrhythmalliance.org

Cardioversion of atrial fibrillation





Providing information, support and access to established, new or innovative treatments for atrial fibrillation

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Glossary

Antiarrhythmic drugs Medication used to restore or maintain the normal heart rhythm

Atrial fibrillation (AF) A common heart rhythm disorder that causes an irregular and often abnormally fast heart rate

Atrium Upper chamber of the heart into which blood returns from the body (right atrium) and from the lungs (left atrium)

Beta blocker A drug that blocks the sympathetic nerve endings, thus slowing the heart rate

CHA2DS2VASc A method of assessing stroke risk in patients with AF or flutter. It is an acronym that stands for **C**ongestive heart failure, **H**ypertension (high blood pressure), **A**ge (75 or over, doubled), **D**iabetes, **S**troke (doubled), **V**ascular disease, **A**ge between 65 to 75 years, **S**ex category (female)

Congestive heart failure A condition in which the heart fails to pump sufficient blood to meet the needs of the body. Fluid may accumulate in the lungs (causing breathlessness) and in the dependent parts of the body (causing ankle swelling)

Coronary Artery Disease Usually narrowing of the coronary arteries – the blood vessels supplying the heart muscle

DCCV (direct current cardioversion) Technique using an electrical shock to convert the rhythm of the heart to normal sinus rhythm

Diabetes A medical condition characterised by inadequate control of blood sugar, which is treated with weight reduction, oral medicines and insulin where appropriate

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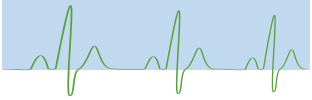


Digoxin (a member of the glycoside family)
A drug derived from the foxglove used to slow the heart during atrial fibrillation and to treat heart failure

Electrocardiogram (ECG) A recording of the electrical activity of the heart taken from the surface of the body. The test is painless and has no risks associated with it

Echocardiograph A picture of the heart constructed by using reflected ultrasound waves. The technique is painless and has no risks associated with it

Electrophysiologist (EP) A cardiologist who specialises in heart rhythm disorders

Heparin An anticoagulant given by injection into a vein or under the skin often given before surgery to reduce the risk of blood clots

Hypertension High blood pressure – a condition that puts strain on the heart, leading to thickening of heart muscle and increased size of the left atrium. It commonly predisposes to AF

International Normalised Ratio (INR) The test used to measure the blood's clotting capability

Pill-in-the-pocket technique Method of using a high dose of an antiarrhythmic drug by mouth, to convert the rhythm of the heart from AF to normal sinus rhythm

Thyrotoxicosis The name given to the clinical effects experienced due to an excess of thyroid hormones in the bloodstream

Ventricle Pumping chamber of the heart. There is a right ventricle (pumping blood to the lungs) and a left ventricle (pumping blood to the body)

Warfarin A medicine used to anticoagulate the blood

Introduction

Atrial fibrillation (AF) is a common rhythm disturbance of the heart which may cause rapid irregular palpitations, chest pain, breathlessness or fatigue. Sometimes it is hardly noticed by the patient. In such cases it is often picked up by routine examination of the pulse (Figure 1), listening to the heart, or recording an electrocardiogram (ECG).

Figure 1: Feeling the pulse, which is very irregular and sometimes rapid in AF.

The rhythm is usually irregular (with not even a hint of regularity) and often it is rapid unless treated.

There are two main strategies for treating AF: rate control and rhythm control. 'Rate control' implies allowing AF to remain and controlling the heart rate. This is often all that is needed when patients are relatively elderly, sedentary and asymptomatic (or only mildly symptomatic). 'Rhythm control' means converting the irregular rhythm to the normal (sinus) rhythm and/or trying to prevent further episodes of AF. This is usually the approach which is favoured when the patient is relatively young, active and/or symptomatic from AF.

Box 1: Cardioversion techniques
Electrical cardioversion
Internal electrical cardioversion
Medical cardioversion
Pill-in-the-pocket technique

Cardioversion for AF

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.

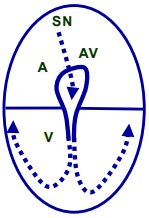
Who should be considered for cardioversion?

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 (Figure 2, panel A). 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 (Figure 2, panel B).

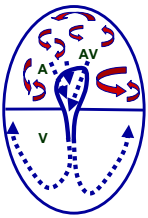
The result is often a rather rapid (up to about 180 beats per minute) and irregular pulse rate which the patient may sense (palpitations) or feel because of the chest pain, breathlessness, light headedness or fatigue that this rapid pulse may cause.

Patients with AF may be treated in one of two ways: 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.

A: Sinus (normal)



B: AF



SN: sinus node (natural pacemaker); A: atrium; V: ventricle; AV node (normal electrical conduction pathway from atrium to ventricle).

Figure 2: Diagrams of the activation of the heart during normal (sinus) rhythm (Panel A) and during AF (Panel B)

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.

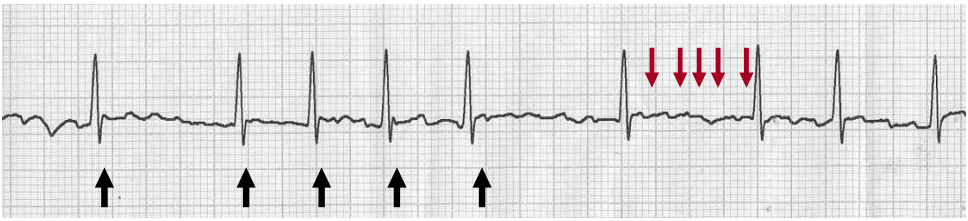


Figure 3: ECG showing AF. The signals causing the beating of the ventricles (black arrows) are irregular and a little rapid; the signals picked up from the fibrillating atrium (red arrows) are very rapid and cause only an irregular ripple effect on the baseline of the trace.

Electrocardiogram or ECG

An electrocardiogram (ECG) is often performed routinely; it is also performed if the patient complains of symptoms which may come from the heart, for example chest pain, breathlessness or palpitations. An ECG is simply a recording of the electrical activity of the heart. It is done by connecting wires to the body of the patient and running them to a machine which can detect voltage differences on the surface of the body. The test is painless and quick, a few minutes at most. Sometimes wires are left attached and connected to an ECG monitor, so that the heart rhythm can be observed continuously, until treatment has been given or the situation has resolved.

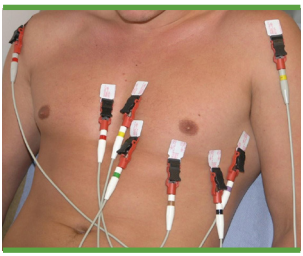


Figure 4: Recording an ECG.

Using this very simple test (Figures 3 & 4) the heart rhythm can be diagnosed with certainty, and some clues to possible underlying heart problems may often be detected.

Echocardiogram

When ultrasound waves are generated by a probe which has been carefully positioned on the surface of the chest, the reflections of these waves ('echoes') can be used to build a picture of the structure and movement of the heart. Almost everyone is familiar with the use of this type of test to see a baby in the womb. The test is painless and without any hazard to the patient although the 'high tech' environment and dim lighting of the echo room can cause anxiety (Figure 5). The results of this test tell the physician about heart muscle disease (thinning or thickening), the size of the main pumping chambers, and the state of the heart valves, any of which might have caused or aggravated the heart rhythm abnormality.

Figure 5: Echocardiograph machine.

Blood tests

A variety of blood tests may be needed depending on the patient's medical history. In almost all cases the activity of the thyroid gland will be measured from the blood sample because over activity of this gland may provoke AF. If the patient has suffered chest pain, a marker of heart muscle damage (troponin) is often measured. If the heart is enlarged, poor heart muscle contraction may be estimated by measuring BNP - a protein in the blood which increases if heart muscle contraction is compromised. If the patient is taking other medicines, has underlying heart disease or has any other medical problems, suitable tests will be arranged. The test results may point to other investigations or treatments which might need to be initiated or completed before cardioversion can proceed. For example, if tests indicate that the potassium level in the blood is too low, the patient may need to receive potassium supplements to increase the level before the cardioversion can take place.

Preparing for cardioversion

Is anticoagulation with blood thinning medicine needed before 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 part of the body. 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 anticoagulants 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 (TOE) - (see Figure 6) performed using a probe which the patient swallows so that the probe lies in the oesophagus (gullet) at the correct level to look directly into the left atrium. In this way it can be seen whether a clot has formed and whether it is safe to proceed with cardioversion without prior administration of warfarin. If a clot is not present, cardioversion may proceed as described earlier with heparin used during the procedure and warfarin given after the procedure.

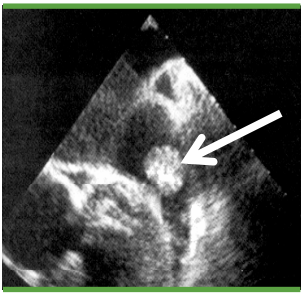


Figure 6: A trans-oesophageal echocardiogram (TOE) showing a blood clot (arrow) in the left atrium.

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 (usually using warfarin) in general practice by a GP 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.

Warfarin 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 three 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 and many other medicines may interfere with the action of warfarin (see AF Association booklet Preventing AF-related stroke).

Assessment hospital visit
(before the date planned for cardioversion)

It is likely that an arrhythmia nurse or coordinator will keep in contact with the patient and the anticoagulation service (GP or hospital based) for the three weeks before a planned cardioversion, in order to monitor the INR. When it seems that the patient's INR levels are well controlled, most hospitals will invite the patient to come to the hospital several days before cardioversion (a 'pre-assessment' visit). At this appointment the patient's heart rhythm will be checked using an ECG to confirm that AF or atrial flutter is still present.

The anticoagulation status and any other outstanding blood test results will be reviewed.

Finally, any anaesthetic risks will be identified so that the anaesthetist can be alerted to any possible problems (diabetes, heart problems, high blood pressure, obesity, lung disease etc.). If all is well, details of the procedure will be discussed with the patient. Consent from the patient to undergo the procedure may be taken at this point, or deferred until the day the patient is admitted for the procedure.

At the pre-assessment appointment various factors may lead to a postponement or cancellation of the procedure.

Box 2: Possible reasons for postponement of cardioversion

- INR results are not satisfactory (<2.0 for three weeks and one day before the cardioversion)
- Transient cause of AF not controlled (e.g., over active thyroid gland or chest infection)
- Other illness present (e.g., flu or tummy upset)
- Administrative problems at the hospital

Other factors such as reverting spontaneously to normal sinus rhythm or anaesthetic risks may be identified.

In some cases the patient may need to stay in hospital overnight to minimise complications. Underlying cardiac disease such as high blood pressure (hypertension), heart failure or thyrotoxicosis may remain uncontrolled and need more treatment before cardioversion can be undertaken, or anticoagulation may be unstable. If no complications are present, then the procedure will be explained to the patient and instructions will be given about travelling to and from the hospital, what medicines to take and when to be 'nil by mouth'.

Box 3: Body mass index (BMI)

Go to the NHS Direct website to calculate your own BMI

This is a measure of body weight. It is calculated by dividing your weight in kilograms by your height in metres squared:

BMI = weight (kg) / height^2 (m)

Index applies to adults as follows:

Underweight	<18.5
Normal weight	18.5-24.9
Overweight	25-29.9

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, 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 nurses and doctors 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 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.

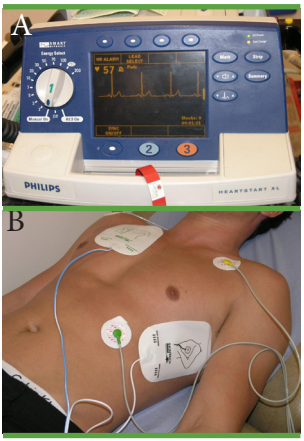


Figure 7: A cardioversion machine (panel A) which is connected to the patient via patch electrodes (panel B) positioned on the front of the chest.

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 (Figure 7, Panel A). Electrode patches or plates are positioned on the back and front of the chest, or on the upper right and lower left or the chest (Figure 7, Panel B). 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 (Figure 8) but sometimes several shocks at increasing energy levels or with different electrode patch positions are needed 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 AF but this can be reduced when necessary by asking the patient to take an antiarrhythmic drug (Box 4).

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.

Box 4: Antiarrhythmic drugs for AF

Class 1

Disopyramide

Flecainide

Propafenone

Class 2

Bisoprolol

Metoprolol

Atenalol

Class 3

Sotalol

Amiodarone

Dronedarone

Also see the AF Association Atrial Fibrillation Drug information booklet

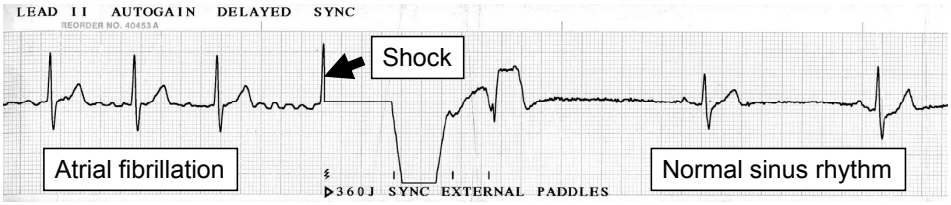


Figure 8: ECG showing the conversion of AF to sinus rhythm after a shock to the heart.

Box 5: 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) 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 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 specific concerns.

Internal electrical cardioversion

Sometimes, if your BMI is high, or the external cardioversion has not worked, 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 via a vein in your groin 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 groin and pass the catheter in to 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 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 (described in Box 5) with the exception of skin burns and the addition of complications inherent in any catheter procedure such as bruising, bleeding, infection and haematoma.

Medical cardioversion

Intravenous (injected through the veins) medicine

Several antiarrhythmic drugs can be used to convert AF into sinus rhythm. Flecainide, sotalol, ibutilide (ibutilide is not available in the UK) and amiodarone can be selected. 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. Usually the arrhythmia will terminate within minutes or at most 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.

Medicines by mouth

It is possible to convert early onset AF 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.

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 get 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, 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 A&E 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.

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 friend or relative and certainly should not drive, operate machinery or do anything requiring concentration and skill that day. The patient will be given anticoagulation medicine to take (usually warfarin) 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 has 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.

And in the longer term?

In the longer term, a suitable therapy which is effective and has minimal side effects must be designed for the patient. Any underlying heart problem must be dealt with.

It is crucial to review the need for ongoing medication after the cardioversion procedure. Anticoagulation treatment should be continued for at least four weeks in all cases. The patient should then be assessed in order to calculate their risk of developing blood clots in the atrium.

Some patients, such as those with artificial heart valves and previous rheumatic fever, definitely need anticoagulation. Other patients are evaluated using a scoring system such as the CHA2DS2VASc system:

Question	Points	Your Score
Are you over 75?	2	
Are you over 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 - A score of 1+ = at risk of AF-related stroke		

The CHA2DS2VASc scoring system allows your doctor to assess your risk of suffering a stroke due to AF or atrial flutter. Whether you should receive stroke preventing medicine can then be decided depending on your calculated risk of having an AF-related stroke.

It is clear that if you are under 65 years with no other risk factors, so called 'lone AF', then your personal AF-related stroke risk is so low that stroke preventative medication is unnecessary and further scoring is not required. By looking at large groups of people with AF and seeing who develops stroke it has become possible to identify certain things which increase an AF patient's risk of AF-related stroke. The most important of these factors have been made into the CHA2DS2VASc scoring system. In this system patients are assessed with various major risk factors (age over 75 or previous stroke) or several minor factors (such as other heart disease or age over 65) as to whether they require anticoagulation.

Your annual risk of AF-related stroke rises from 0% a year with no risk factors (score 0) to over 10% a year for a score of five or six. Most experts who have looked at this scoring scheme (the CHA2DS2VASc score) would suggest that the benefits of taking anticoagulation medication outweigh risks if you have a CHA2DS2VASc score of one or more.

If your risk score suggests you are at risk of AF-related stroke and require long-term anticoagulation then procedures to return your heart to its normal rhythm, such as cardioversion, do not reduce this risk. You will often find in this setting that your rhythm specialist will want to continue your anticoagulation after the procedure whether successful or not.

The need for continuing antiarrhythmic treatment should be carefully considered. If the cardioversion was unsuccessful and no further intervention such as another cardioversion or an ablation procedure are to be undertaken, it is unnecessary to continue to take antiarrhythmic medication. Rate control drugs such as beta blockers, calcium antagonists (verapamil or diltiazem), or digoxin should be considered. If the cardioversion was successful, the antiarrhythmic medication may be continued as long as the physician believes that there is a significant risk of a relapse.

Patient checklist for electrical cardioversion

	Action	Done
1	Contact the AF Association for the cardioversion patient checklist.	✔
2	Ask for brochures and information from the hospital.	
3	Read about the cardioversion procedure.	
4	Do you know why you have been recommended to undergo a cardioversion?	
5	Who is your contact / link person at the hospital, e.g. an arrhythmia nurse?	
6	Have you been started on anticoagulation? – If not, ask your GP or hospital contact.	
7	If you have started on warfarin you need weekly blood tests; have they been arranged?	
8	Who is keeping an eye on these results (arrhythmia nurse, anticoagulation clinic, or general practitioner)?	
9	Who is responsible for planning the date for your cardioversion?	
10	Is there a pre-assessment appointment before your cardioversion for you to ask questions?	

11 Do you know which of your medicines you have to continue to take, and which should be stopped, and when?

12 Have you seen and read the consent form and the official information sheet about the procedure?

13 Do you understand the risks associated with cardioversion?

14 Have you talked to the person who will do the cardioversion?

15 If English is not your first language, has an interpreter been arranged?

16 Make arrangements to be collected after discharge – remember you will not be allowed to drive.

17 You may need to consider taking time off work (especially the day after the cardioversion, especially if your work involves driving or when the cardioversion is scheduled for late in the day).

18 Arrange for family / friend to stay overnight, post discharge.

Arrhythmia Alliance

www.heartrhythmalliance.org

AF Association

endorsed by Department of Health

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

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For our full publications list on Arrhythmia, AF and Syncope please contact us.

AF Association, Unit 6B, Essex House,
Cromwell Business Park, Chipping Norton,
Oxfordshire OX7 5SR

+44 (0)1789 867 502

info@afa.org.uk

www.afa-international.org

If you would like further information or would like to provide feedback please contact AF Association.

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