

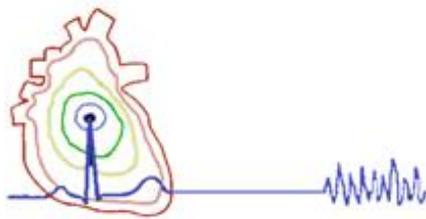


Sydney Cardiology Group

Patient Guide to Atrial Fibrillation Ablation

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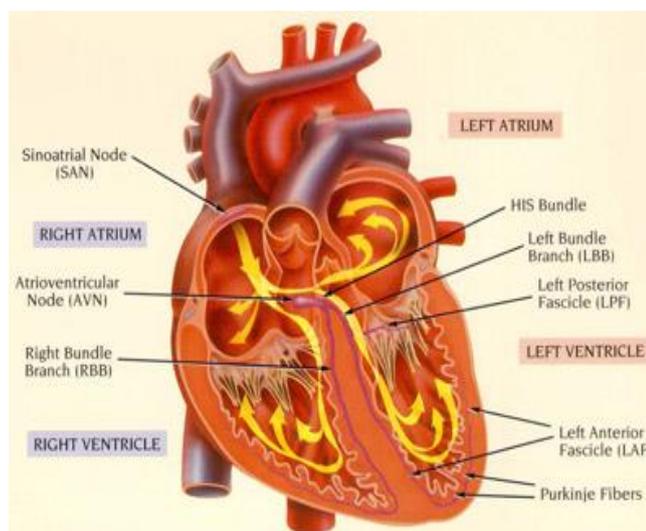
CHATSWOOD
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You have a heart rhythm disturbance called atrial fibrillation and may be a candidate for an "ablation procedure" to help alleviate your symptoms. This document will provide information regarding treatment options available for atrial fibrillation with a focus on *catheter ablation*.

STRUCTURE OF THE HEART

The heart has 4 chambers. The right and left atria (upper chambers) collect blood to fill the right and left ventricles (lower chambers) which in turn pump blood to the body and lungs.

The lungs provide oxygen to the blood with breathing. This "red" blood returns to the left atrium by 4 *pulmonary veins* (2 from each lung). Blood passes from the left atrium to the left ventricle which pushes blood from the heart to the body including brain, vital organs and muscles. The organs use up the oxygen and this "blue" blood returns to right heart. The right atrium collects the blood, passes it to the right ventricle and then on to the lungs again for oxygen.



The heart beats because of electrical signals it receives. Normally, the sinus (sinoatrial) node within the right atrium, regulates the heart rhythm by sending an impulse through the upper chambers causing them to squeeze ("lub"). This impulse then travels to the lower chambers via the AV node, causing the lower chambers to squeeze ("dub"), usually 60 to 80 times every minute. This upper and lower sequence ("lub-dub") represents one heart beat.

WHAT IS ATRIAL FIBRILLATION?

Atrial fibrillation is a rhythm disturbance of the upper chambers and occurs when the left and right atrium no longer beat in an organized manner. During atrial fibrillation, the sinus node is suppressed by rapid erratic electrical activity (fibrillation) causing the upper chambers to beat between 300-600 times every minute. Fortunately, the AV node functions as an "electrical filter" and does not allow all of these beats to get to the ventricles. In atrial fibrillation, the ventricles often beat between 80 to 180 beats per minute. Atrial fibrillation may cause palpitations, lightheadedness, fatigue, shortness of breath or reduced ability to exercise or perform daily activities. Symptoms are due to heart rhythm irregularity and increased heart rate.

HOW IS ATRIAL FIBRILLATION TREATED?

There are two approaches for the treatment of symptoms of atrial fibrillation. One approach is to *restore and maintain sinus rhythm* and the other is to simply *control the rate* of the ventricles during atrial fibrillation.

The first approach (rhythm control) is achieved by using heart rhythm medications (*anti-arrhythmic drugs*) that are between 40-65% effective at maintaining normal

rhythm. These medications work at the atrium to suppress atrial fibrillation and restore normal sinus node function. Often, the heart must be electrically “reset” by an external shock known as *cardioversion* if medication does not work in the first instance. Cardioversion is performed in hospital under brief general anaesthesia. Anti-arrhythmic medication is usually continued in order to maintain sinus rhythm. Examples of such medications include sotalol (Sotacor), flecainide (Tambocor, Flecatabs) and amiodarone (Cordarone, Aratac).

The second approach (rate control) is achieved by medications such as beta-blockers, calcium channel blockers or digoxin which prevent the heart from going too fast. Such medications include metoprolol (Tenormin), bisoprolol (Bicor), atenolol (Noten), diltiazem (Cardizem), verapamil (Isoptin) and digoxin (Lanoxin). These medications work at the AV node to allow fewer impulses to travel from the atrium to the ventricle. The heart rate is slowed but remains irregular as atrial fibrillation continues.

Although it seems intuitive that the first approach should be more effective, this has not been demonstrated in large research studies. The appropriate treatment of atrial fibrillation is therefore individualised.

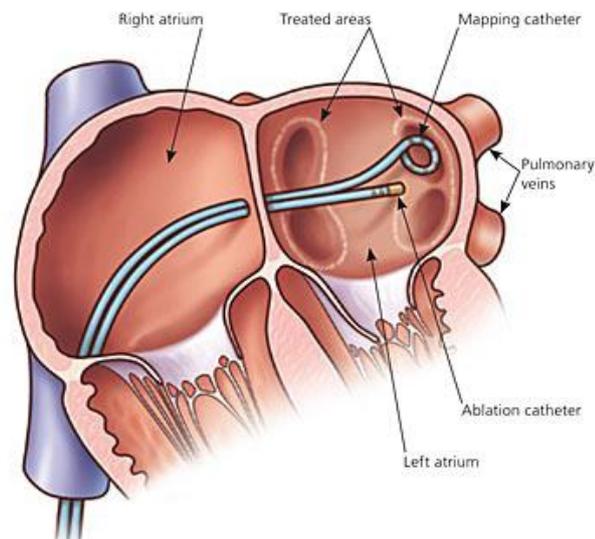
Atrial fibrillation itself does not put one at risk of dying suddenly or having a heart attack. It does, however, carry an increased risk of stroke. Individuals who are considered to be at moderate or high risk of stroke should receive an *anticoagulant* (blood thinner) such as warfarin (Coumadin, Marevan), dabigatran (Pradaxa), apixaban (Eliquis) or rivaroxaban (Xarelto) to reduce this risk. Individuals who are considered to be at low risk of stroke do not require an anticoagulant or aspirin.

ATRIAL FIBRILLATION ABLATION

Treatment with drugs is the first line of therapy for atrial fibrillation. However, many patients are not happy with drug treatment. Drugs may not control symptoms or may cause side effects. Other patients wish to avoid medications for as long as possible.

Catheter ablation is an alternative to medication for arrhythmia management and has been widely used since 1990 for a variety of arrhythmias. Catheter ablation for atrial fibrillation has been used since 2000 and is ever-evolving with new technologies and techniques.

Ablation of atrial fibrillation involves the creation of scars within the left atrium to stabilise electrical short circuits. These scars are created by *catheters* (wires or balloons) that are introduced into the heart via the leg veins at the groin. Usually, 3 to 4 catheters are located within the heart recording electrical activity, one of which has the ability to create scars in the heart using either radiofrequency (RF) ablation (heat / cautery) or cryoablation (freezing).



Currently, it is thought that most atrial fibrillation is initiated by abnormal rapid electrical firing within the pulmonary veins that return "red" blood from the lungs to the left atrium. The ablation procedure involves burning or freezing around the 4 pulmonary veins to prevent this abnormal electrical activity entering the heart, thereby preventing atrial fibrillation. Some patients require the creation of additional scars at other areas to prevent atrial fibrillation.

The ablation procedure is performed in a laboratory with several staff including a specialist in cardiac rhythm disturbance (electrophysiologist), nursing and technical staff. It usually takes between 2 and 4 hours and is performed under general anaesthesia. Local anaesthetic agent is used at the groin allowing painless insertion of the catheters which are then guided to the right atrium under x-ray vision. The ablation catheter is passed from the right to the left atrium by creating a small hole in the wall that separates them (atrial septum) thereby allowing access to the pulmonary veins. This small hole usually heals spontaneously within a few weeks without consequence.

WHAT ARE THE SUCCESS RATES?

It is important to understand that there is no "forever" cure for atrial fibrillation and that ablation is not effective for all people. The goal of treatment is to achieve a lower symptom burden and an improved quality of life. The success rate of ablation is approximately 70% and the definition of "success" ranges from feeling better but still needing medication, to being free of atrial fibrillation and off medication. About 30% of patients require more than one procedure which adds an additional 10% benefit. Importantly, the majority of patients undergoing ablation still require a lifelong blood thinner as the risk for stroke is not reduced by ablation, despite apparent success.

WHAT ARE THE DOWN SIDES?

Although ablation procedures are generally safe, ablation for atrial fibrillation is associated with serious and potentially life threatening risks. Candidates therefore require careful selection and must be fully informed of the risks and outcomes before agreeing to the procedure.

- Bleeding or bruising from the site where tubes are inserted at the groin 3-5% (includes haematoma, inadvertent artery injury (laceration / dissection / false aneurysm), deep vein thrombosis)
- Heart perforation with cardiac tamponade (bleeding around the heart) 1%
- Blood clot formation that could lead to stroke or lung embolus 0.5 - 1%
- Pulmonary vein stenosis (narrowing damage) 1%
- Damage to the "AV node" and requiring a pacemaker 1%
- Atrio-oesophageal fistula (traumatic hole from the heart to oesophagus) 1 in 5000 (radiofrequency ablation) which is often fatal
- Phrenic nerve paralysis (injury to nerve of diaphragm) 2 - 6% (cryoablation)
- Gastric dysmotility (injury to nerves of the stomach) 1%
- Worsening of arrhythmia (esp. in first 3 months) e.g. left atrial flutter - 5%
- Failure of procedure and need for re-do ablation 30%
- Other: infection, myocardial infarction (heart attack)
- Rarely, complications that lead to emergent surgery or death

It is emphasized that the procedure is aimed at symptomatic improvement, is elective, non-lifesaving and with infrequent but potentially life threatening risks.

AM I A CANDIDATE?

Ablation for atrial fibrillation is generally reserved for patients who have symptoms that significantly impact their lives despite drug therapy. Other factors such as age, duration of atrial fibrillation, size of the heart chambers, previous stroke or other medical conditions may play a role in deciding whether you are a suitable candidate.

WHAT PREPARATION IS REQUIRED?

Anticoagulation is required for at least one month prior to the ablation procedure and will be discontinued beforehand. Warfarin is usually stopped 5 days in advance and is replaced by a short acting injectable anticoagulant called Clexane 2 days prior. Newer anticoagulants may continue until two days prior without the need for Clexane.

A *transoesophageal echocardiogram* (TOE) is routinely performed under anaesthesia immediately before the procedure is commenced. This internal cardiac ultrasound is performed to exclude a blood clot within the heart which might otherwise be disturbed by the catheters during the procedure causing a stroke.

A *cardiac CT scan* is required to create a 3-dimensional model of the left atrium and pulmonary veins. It provides critical information that is needed for the selection of catheters and technique to ensure a successful and safe procedure. It should be performed 2 weeks in advance and a specific referral will be provided.

WHAT HAPPENS AFTER ABLATION?

After ablation, the catheters are removed and a suture is placed at the groin for 2 hours to reduce the likelihood of bleeding. You will be transferred to the coronary care unit where you must lie flat for several hours to allow the puncture sites to seal.

Nursing staff will administer an injection of Clexane overnight. Newer anticoagulants such as Pradaxa, Eliquis, Xarelto are started the following day. Warfarin is recommenced on the evening of the procedure and self administered Clexane injections are required for *at least 3 days* while the warfarin level (INR) is restored.

An overnight hospital stay is required and most patients are discharged the following day. You may return to your usual activities by day 3 to 5.

Blood thinners will continue for a *minimum period* of 8 weeks after ablation and will continue indefinitely in most patients. Antiarrhythmic medications used to control your heart rhythm may be withdrawn at 2 or 3 months following ablation but this will be determined during subsequent follow up visits.

WHAT IF I HAVE MORE QUESTIONS?

If you have further questions they will be addressed at your consultation.

USEFUL LINKS

<http://www.heartrhythmalliance.org/afa/au>

https://www.heartfoundation.org.au/images/uploads/publications/CON-175_Atrial_Fibrillation_WEB.PDF