Practice pointer

**Ablation therapy in atrial fibrillation**

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**Introduction**

Atrial fibrillation has a prevalence of 1% in the general population and 6% in those aged over 60. It increases the risk of stroke by five-fold1 and doubles the risk of death. Although often asymptomatic, symptoms may include palpitations, breathlessness, exercise intolerance and reduced quality of life (<https://jamanetwork.com/journals/jama/fullarticle/2728674>).

Atrial fibrillation can be managed with pharmacotherapy, but ablation therapy is an option for symptomatic patients who wish to avoid or cannot tolerate medication. Once a cardiologist has assessed that the patient is a suitable candidate for the procedure, patients may have further questions to put to their general practitioner or other care provider. To aid these discussions this practice pointer outlines what ablation therapy entails, the potential risks, the likelihood of success and post-operative advice.

**When is ablation therapy offered to patients with atrial fibrillation?**

There has been a rise in the number of catheter ablation procedures carried out for atrial fibrillation, with over 6000 procedures being performed annually in the UK (approximately 100/million population).2 The National Institute for Health and Care Excellence (NICE) recommends the use of percutaneous radiofrequency ablation for those whose atrial fibrillation is impacting their quality of life and who have not responded to, or wish to avoid anti-arrhythmic medication or in whom such medication is contraindicated.3

**What is the evidence for ablation therapy?**

This section outlines the current evidence relating to the impact of catheter ablation on normalising arrythmia, mortality and quality of life.

**Normalising arrythmia**

**Overall**

In a meta-analysis of 11 randomised trials comparing catheter ablation versus anti-arrhythmic therapy in atrial fibrillation, ablation demonstrated superior efficacy in reducing atrial fibrillation recurrence (RR 0.47; 95% CI 0.38-0.58; p<0.001).4 In drug refractory paroxysmal atrial fibrillation, cryotherapy and radiofrequency ablation demonstrate similar efficacy.11

**Short term**

“Early recurrence” of atrial fibrillation, atrial flutter or atrial tachycardia in the first 3 months after the ablation procedure has been reported in up to 50% of patients.12 This is usually due to irritability in the heart from the ablation procedure, often resolves spontaneously, and does not necessarily mean that the procedure has been unsuccessful. Repeated ablation procedures may be considered 3 months after the initial procedure in those with ongoing symptoms affecting quality of life. Approximately 20-40% of patients will require more than one procedure [<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5089515/#R13>]

**Longer term**

In a meta-analysis of 19 studies, following a single ablation procedure, overall 53.1% (95% CI 46.2% - 60.0%) of patients were in sinus rhythm at 3 years follow up. The success rate rose to 79.8% (95% CI 75.0% - 83.8%) for patients undergoing multiple procedures. The superior effects of ablation on maintaining sinus rhythm were greater in those with paroxysmal atrial fibrillation with 67% of these patients maintaining sinus rhythm at 12 months compared to 52% of patients with non-paroxysmal atrial fibrillation [<https://www.ahajournals.org/doi/full/10.1161/JAHA.112.004549>].

Recurrence of atrial fibrillation is more likely in older patients and in those with persistent atrial fibrillation or comorbidities such as high blood pressure, diabetes, obesity, heart failure and sleep apnoea.13 Optimising comorbidities will maximise the likelihood of a successful ablation procedure.

**Mortality**

The landmark CABANA trial, the largest randomised controlled trial to date, reported its findings in 2018. The trial randomised 2204 patients with symptomatic atrial fibrillation to ablation or medical therapy. In an intention-to-treat analysis, ablation failed to reduce the primary composite of mortality, disabling stroke, major bleeding and cardiac arrest (8.0% vs 9.2% HR 0.86; 95% CI 0.65-1.15; p=0.30) as well as the secondary non-composite mortality endpoint (5.2% vs 6.1% HR 0.85; 95% CI 0.60-1.21; p = 0.38). However at a median follow up of 48 months, the secondary endpoint of death or cardiovascular hospitalisation was significantly better with ablation (51.7% vs 58.1% HR 0.83; 95% CI 0.74-0.93; p = 0.001). Overall, the study did confirm that atrial fibrillation ablation has a good safety profile and by reducing hospitalisations, and this may have financial benefits, that are particularly welcome in the current NHS climate.

Atrial fibrillation in patients with heart failure is associated with higher morbidity and mortality. The CASTLE-AF trial found the risk of death or hospitalisation for worsening heart failure was lower in patients with symptomatic atrial fibrillation and heart failure randomised to catheter ablation compared to medical therapy (28.5% vs 44.6% HR 0.62; 95% CI 0.43-0.87; p=0.007).8

**Quality of life**

The CABANA trial also reported superior efficacy of ablation therapy in improving quality of life at 12 months follow up in symptomatic atrial fibrillation patients. [doi:[10.1001/jama.2019.0692](http://jamanetwork.com/article.aspx?doi=10.1001/jama.2019.0692)]. These findings support the results of previous smaller scale trials [<https://www.nejm.org/doi/full/10.1056/NEJMoa1113566> ; <https://jamanetwork.com/journals/jama/fullarticle/185277>]

**What does ablation therapy entail?**

Atrial fibrillation is due to aberrant electrical activity at the junction between the pulmonary veins and the left atrium. Ablation therapy aims to isolate and destroy these foci of aberrant electrical activity and facilitate maintenance of sinus rhythm. Ablation is achieved through either heating (radiofrequency ablation) or freezing (cryoablation) the heart tissue.

**Do patients need to take medication after ablation therapy?**

**Thromboembolism prophylaxis**

As catheter ablation creates a prothrombotic state, guidelines recommend anticoagulation with either warfarin or a direct oral anticoagulant for all patients for at least 4 weeks before the procedure and 2 months after the procedure. There is currently no randomised trial evidence showing that successful ablation reduces the risk of embolic stroke, with one study reporting a 60% greater stroke or TIA risk in those with resolved atrial fibrillation compared to patients with no history of atrial fibrillation [<https://www.bmj.com/content/361/bmj.k1717>]. The exact reason for this is unclear, but may be related to the recurrence of subclinical atrial fibrillation episodes, which are harder to detect [<http://jtd.amegroups.com/article/view/3782/4249>]. Therefore, even if sinus rhythm is maintained, patients are advised to continue anticoagulation based on the pre-ablation CHA2DS2-VASC score. Women with a score ≥2 and men with a score ≥1 should continue long term anticoagulation.

**Other medications**

Proton pump inhibitors (such as lansoprazole) are commonly prescribed for one month after the ablation procedure, to minimise oesophageal inflammation and reduce the likelihood of development of an atrio-oesophageal fistula, a rare but potentially fatal complication. This recommendation is based on case reports and expert opinion.14

Antiarrhythmic medication (such as flecainide) in combination with atrioventricular nodal blocking drugs (such as β-blockers, calcium channel blockers or digoxin) taken for 6 weeks after ablation has been shown to minimise irritability of the heart, thereby reducing arrhythmia-related hospitalisation in the early post-operative period.15 However, the benefits of antiarrhythmic medications to improve long-term outcomes is currently unclear.12

**Monitoring and follow up**

A consensus statement by the Heart Rhythm Society, European Heart Rhythm Association and European Cardiac Arrhythmia Society states that patients should be followed up by a cardiologist a minimum of 3 months after the procedure and then be seen by a healthcare professional, such as a general practitioner, cardiologist or electrophysiologist, on an annual basis thereafter. These annual reviews serve to monitor the heart rhythm and stroke risk as well as to allow ongoing management of associated risk factors and comorbidities.12

In recent years, a plethora of new technologies has emerged, allowing patients to detect and monitor arrythmias on ambulatory electrocardiographic recording devices such as smartphones or wrist watches. The potential of such devices to reduce the incidence of delayed atrial fibrillation diagnoses as well as the associated morbidity and mortality is currently being explored. It is likely that clinicians in both primary and secondary care will be increasingly involved in interpreting the arrhythmias generated by these devices as well as counselling patients on their use.

**What you need to know**

1. Ablation may be an option for people with atrial fibrillation not responding to anti-arrhythmic medication or in those who are unable to take such medications due to contraindications or intolerance
2. Ablation has been shown to reduce symptoms and improve quality of life but has not yet been shown to reduce stroke risk or mortality
3. The success rate in returning to sinus rhythm is around 80% at 3 years but up to a third of patients need more than one procedure to achieve this success rate
4. Complications occur in 1.6% of procedures for example, vascular access site problems, stroke, pericardial effusion, cardiac tamponade, pulmonary vein stenosis, atrio-oesophageal fistula, phrenic nerve damage or death
5. Anticoagulants need to be continued for at least 2 months after the procedure and may be continued indefinitely in patients at higher risk of stroke

**Education into practice**

For patients undergoing ablation therapy, have you discussed the likelihood of success and the risks associated with the procedure?

For patients who have had the procedure, do you check their heart rhythm and review their symptoms and medication every year?

For patients who have had the procedure, have you reviewed their pre-ablation CHA2DS2-VASc score to assess stroke risk and checked their cardiologist’s recommendations about the need for long-term anticoagulation therapy?

**Questions for further research**

In patients with a high stroke risk profile and recent onset of atrial fibrillation, does early rhythm control therapy reduce cardiovascular complications?

Are short term corticosteroids an effective and safe option in the prevention of post ablation atrial fibrillation recurrence?

What is the role of newer technologies in earlier detection of atrial fibrillation and what are its impact on stroke rates and mortality?

**Additional educational resources**

The National Institute for Health and Care Excellence (NICE) guidelines for percutaneous radiofrequency ablation for atrial fibrillation: <https://www.nice.org.uk/guidance/ipg168>

European Society of Cardiology Guidelines: <https://academic.oup.com/eurheartj/article/37/38/2893/2334964>

Heart Rhythm Society, European Heart Rhythm Association and European Cardiac Arrhythmia Society expert consensus statement on catheter and surgical ablation of atrial fibrillation: <https://www.hrsonline.org/Policy-Payment/Clinical-Guidelines-Documents/2017-HRS-EHRA-ECAS-APHRS-SOLAECE-Expert-Consensus-Statement-on-Catheter-and-Surgical-Ablation-of-Atrial-Fibrillation>

**Information resources for patients**

Arrythmia Alliance Information and Advice. (Free resource, no registration required): <http://www.arrhythmiaalliance.org.uk/>

British Heart Foundation. (Free resource, no registration required): <https://www.bhf.org.uk/>

Atrial Fibrillation Association. (Free resource, no registration required): <http://www.heartrhythmalliance.org/afa/uk/>

Patient information on atrial fibrillation. (Free resource, no registration required): <https://patient.info/health/atrial-fibrillation-leaflet>

**How this article was made**

Discussion with 12 general practitioners suggested that they needed more information to support patients undergoing ablation therapy. To create this article, we searched PubMed and the Cochrane Library (using terms “atrial fibrillation” and “catheter ablation”) for evidence on catheter ablation in atrial fibrillation and identified any additional relevant articles through reference lists. Guidelines from the National Institute for Health and Care Excellence, European Heart Rhythm Association and European Cardiac Arrhythmia Society were used to generate recommendations. Expert co-author opinion in Electrophysiology formed a valuable contribution in detailing technical aspects of the ablation procedure.

**How patients were involved in the creation of this article**

This Practice Pointer has drawn on experience from a real patient journey which involved a fit and active 60 year old man undergoing a diagnostic work-up for paroxysmal atrial fibrillation, eventually followed by treatment with ablation. The questions that arose during his patient journey are common to this group of patients. This article aims to answer these questions.

**INFOGRAPHIC – Ablation therapy in atrial fibrillation**

Ablation therapy is an increasingly common procedure indicated in patients with atrial fibrillation causing symptoms (such as palpitations or breathlessness) who have not responded to anti anti-arrhythmic medication or not wanting to take such medications. This infographic summarises what ablation therapy entails, including the potential benefits and risks.

4 MAIN SECTIONS OF THE INFOGRAPHIC

1. OVERALL

Ablation therapy in atrial fibrillation reduces symptoms and improves quality of life but has not been shown to reduce stroke risk or mortality

1. WHAT DOES ABLATION THERAPY ENTAIL?
* **Before the procedure**

A specialist will discuss the planned hospital stay and advise on existing medications. Anticoagulation with warfarin or a direct oral anticoagulant for 4 weeks before the ablation is advised to reduce the risk of stroke during the procedure.12

* **During the procedure**

The procedure may be performed under sedation with a local anaesthetic or with a general anaesthetic. Long thin wires known as catheters are threaded into the heart via tubes inserted into the veins in the groin. Heat (or freezing) is used to destroy the area of heart tissue with abnormal electrical activity so that a normal rhythm is restored. The procedure may last 1-4 hours.

* **After the procedure**

Most patients are discharged the day after the procedure, but those who have undergone an uncomplicated procedure may be discharged the same day.

* There is a two-day legal driving restriction post-operatively9
* Strenuous exercise or heavy lifting should be avoided for 2-3 weeks and flying for one week
* Sexual intercourse may be resumed after two days
* Wound site care – take showers instead of baths for the first week and keep the site clean. Medical assistance should be sought if the groin becomes painful, swollen or red, or a lump is felt
* **Thromboembolism prophylaxis (“blood thinners”)**
* Anticoagulation with either warfarin or a direct oral anticoagulant should be continued for 2 months after the procedure12
* CHA2DS2-VASC score: Women with a pre-ablation score ≥2 and men with a score ≥1 are advised to continue anticoagulation indefinitely even if sinus rhythm is maintained12
* **Monitoring**
* The patient should be followed up by a cardiologist a minimum of 3 months after the procedure and then be reviewed annually by a healthcare professional to ensure ongoing management of risk factors and comorbidities such as high blood pressure, diabetes and obesity.
1. WHAT ARE THE RISKS OF ABLATION THERAPY?

Common side effects include bruising around the groin where tubes have been inserted, or chest pain during the procedure which may last intermittently for a week.

The risks of serious complications are less than one in 50 (1.6%), and these risks are reducing as techniques improve.12

Serious complications include:

* Cardiac tamponade (1 in 100)
* Stroke (1 in 100)
* Pulmonary vein stenosis (<1 in 100)
* Nerve damage (<1 in 100)
* Atrio-oesophageal fistula (<1 in 1000)
* Death (<1 in 1000)

Cardiac tamponade may result if the heart muscle is perforated during the ablation procedure causing blood to accumulate around the heart and compromise its pumping action. It needs urgent treatment by inserting a pericardial drain.

Pulmonary vein stenosis – proximity of ablation targets to the pulmonary veins can cause narrowing or complete blockage. This may lead to breathlessness or coughing up blood. The vessels may be reopened by angioplasty.

An atrio-oesophageal fistula may develop if an abnormal connection is created between the left atrium and the oesophagus during the ablation procedure. Onset of symptoms may be insidious resulting in fevers, collapse and vomiting blood. It is difficult to treat and may necessitate major thoracic surgery.

4. WHAT ARE THE OUTCOMES IN ABLATION THERAPY?

* Ablation has been shown to reduce symptoms and improve quality of life but has not yet been shown to reduce stroke risk or mortality
* The success rate in returning to sinus rhythm is around 80% at 3 years but up to a third of patients need more than one procedure to achieve this success rate
* Recurrence of atrial fibrillation is more likely in older patients and in those with persistent atrial fibrillation, high blood pressure, diabetes, obesity, heart failure or sleep apnoea

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