

## Pacemaker and AV node ablation for AF

This factsheet summarizes the 'ablate and pace' strategy, explains the procedure within the context of treatments for AF, and aims to help patients and carers to weigh up the pros and cons of undergoing this operation.

Atrial fibrillation (AF) is a condition characterized by rapid uncoordinated beating of the top chambers of the heart (the atria), and irregular and usually rapid beating of the main pumping chambers (the ventricles). As a result of this abnormal beating, blood may collect in the atria, forming blood clots, which can then travel in the bloodstream and block blood vessels downstream causing problems such as stroke. AF may also result in symptoms such as palpitation, reduced exercise capacity, breathlessness, fatigue and dizziness.

### Treatment strategies for AF

Treatment of AF has two aims: reducing stroke risk and treating symptoms due to AF. Treatment of the symptoms of AF falls into two groups:

- Rhythm control aims to restore and maintain the normal heart rhythm using electrical cardioversion, antiarrhythmic drugs or ablation.
- Rate control makes no attempt to stop the atria fibrillating, but instead aims to control the speed at which the ventricles beat.

Many factors influence the decision about whether to use a rhythm control or a rate control strategy in an individual patient. Although great advances have been made in our ability to achieve rhythm control, it is not possible or even appropriate to achieve rhythm control in all patients.

Rate control is usually achieved with drugs such as beta blockers, calcium channel blockers and digoxin, sometimes in combination. These drugs act on the electrical connection between the atria and the ventricles known as the atrioventricular (AV) node. Most patients achieve satisfactory rate control with these drugs, but in some cases it cannot be achieved, either because the drugs do not slow the heart rate adequately, or because of side effects from the drugs. AV node ablation and pacing (also known as 'ablate and pace' or 'pace and ablate') is appropriate in this situation.

### The process

AV node ablation involves passing a catheter (a plastic tube containing thin flexible wires) from a vein in the groin to the heart and cauterizing (ablating) the AV node. The procedure is usually performed as a day case, under local anesthetic and sedation, typically takes about half an hour, and is overwhelmingly successful with a very low complication rate. Following AV node ablation, the atria continue to fibrillate, but none of the rapid electrical activity in the atria reaches the ventricles, so they will typically beat slowly and in a regular rhythm. Therefore, a pacemaker is used to ensure that they beat at an appropriate speed, both at rest and during physical activity.

A pacemaker is a battery powered electronic device used to stimulate the heartbeat. It consists of a small titanium generator containing a battery, electronic circuitry, and one or more leads which pass from the generator through the veins inside the chest to the heart. The pacemaker is usually implanted under local anesthetic and sedation in a procedure typically taking about an hour. The decision about whether to implant a one-lead, two-lead or three-lead pacemaker is determined by the type of atrial fibrillation (paroxysmal, persistent or permanent), and also the pumping function of the ventricles.



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Although AV node ablation and pacemaker implantation may be performed as a combined procedure, sometimes the pacemaker is implanted a few weeks before it is required to ensure that the pacemaker is working satisfactorily and that there are no problems before the AV node ablation is performed.

### Advantages of AV node ablation and pacing

- AV node ablation and pacing as a treatment for AF has been practiced since 1990 and so a great deal of experience and evidence from clinical trials has been gathered.
- There is a very high single-procedure success rate, both for pacemaker implantation and AV node ablation.
- Most people's symptoms improve, often dramatically.
- In many cases, there is no need to take drugs to control the heart rate or rhythm.

### Disadvantages of AV node ablation and pacing

- AV node ablation is irreversible – most people will be dependent upon their pacemaker following the procedure. Pacemakers are extremely reliable and are monitored closely, but not everyone wishes to be pacemaker-dependent.
- As the procedure does not stop the atria fibrillating, most people will need to continue to take blood-thinning drugs, depending on their stroke risk. It is important to note that there is currently little evidence that an apparently successful rhythm control strategy lowers stroke risk, and therefore patients at

higher risk of stroke usually have to continue on anticoagulants whether a rhythm control or a rate control strategy is used.

- The procedure does not restore the normal heart sinus rhythm and so the heart will not work as well as it would in the normal rhythm. Therefore symptom relief may not be as good as might be expected with restoration of the normal heart rhythm. For this reason an 'ablate and pace' strategy is usually recommended after rhythm control strategies have proved unsuccessful or are considered inappropriate, and where satisfactory rate control has not been achieved with drugs.
- There is a risk of a complication related to pacemaker implantation of approximately 1 in 20. Most of these complications are in the nuisance category and fairly easily dealt with, but serious complications, including infection, can occur. Furthermore the pacemaker generator will need replacing typically every ten years, introducing further risks. Complications of AV node ablation are rare.

Please speak to your clinicians if you have any questions or concerns not covered in this fact sheet.

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