

## Pace and Ablate for AF

“Rate Control” in Atrial Fibrillation (AF - see AFA Fact Sheet “Atrial Fibrillation”) means using medical treatment to slow the speed of the pulse without stopping or preventing the rhythm disturbance itself.

In normal (“sinus”) rhythm there is one coordinated contraction of, the upper heart chambers (“atria”) per heartbeat. The electrical signal is then conducted through specialised tissue known as the “Atrioventricular (AV) node” (A for Atrium, V for Ventricle) which connects electrically the atria to the lower main pumping chambers (“ventricles”). Conduction of the electrical signal through the AV node triggers contraction of the ventricles approximately 1/5 of a second after atrial contraction. It is the contraction of the ventricles which determines the heartbeat and pulse rate.

The hallmark of AF is rapid and uncoordinated electrical activity and contraction in the upper chambers (“atria”). The heart rate in someone with AF depends on how many of these very frequent electrical impulses are conducted to the ventricles through the AV node. Beta blockers (e.g. metoprolol), calcium channel blockers (e.g. diltiazem) and digoxin, used alone or in combination, act on the AV node to slow conduction and reduce the heart rate. With a strategy of rate control, which is the best choice for managing AF in many patients, AF is not stopped or prevented but symptoms and quality of life are improved because the pulse is slower and heart function more efficient.

If medications are ineffective or not tolerated, catheter ablation of the AV node to block conduction from the atria to the ventricles can be undertaken. After ablation the ventricles usually beat at a very slow rate –

this is akin to the situation people can develop spontaneously (or even be born with) called “complete heart block”. As with spontaneous heart block an artificial permanent pacemaker is required to elevate the heart rate to a level needed for normal day-to-day activities.

### What is a Pacemaker?

A pacemaker is a device implanted under the skin which stimulates the heart to beat by delivering a small electrical pulse down flexible wires placed against the heart wall. The pacemaker is usually positioned in the upper front of the chest outside the ribcage. The pacing wire/s (“lead/s”) are passed down to the heart through the veins which come up from the arm and run under the collar bone.

Pacemakers are extremely reliable and are very carefully tested and monitored. They do need to be checked at least once a year. The batteries inside typically last for 7-10 years before the whole pacemaker (not just its battery) needs to be changed. Like all operations pacemaker implants can cause complications, the most serious being infection which may require complete replacement of both the pacemaker and the leads. Overall, the risk of complications is low, around 5%.

The heartbeats produced by a pacemaker are not quite as efficient as the natural heartbeats but in practice this is uncommonly a problem. A pacemaker can be adjusted to suit an individual’s requirements by sending radio signals to the device from a “programmer” device.

For your safety it is usual to implant the pacemaker some weeks before the ablation procedure. After ablation the pacemaker rate will usually be set higher and gradually

reduced over some weeks. A pacemaker will make the heart beat faster on exercise and more slowly at rest, as did your heart's natural pacemaker before AF occurred. Moreover the rhythm of the ventricles and thus the pulse becomes completely regular, and rate-slowing medications can often be stopped.

### The AV node ablation procedure

Catheter ablation is a well established technique involving passing a wire or wires (catheters) into the heart, usually via the groin. One of these wires is then used to destroy tissue by applying heat or cold. Ablation of the AV node is the most simple and safest heart ablation procedure. It cannot be reversed so people who have undergone this procedure are generally dependent on a pacemaker for the rest of their lives.

### Anticoagulation:

Pacing and AV node ablation does not stop the fibrillation of the atrium. Since this is what causes the risk of blood clots the need for aspirin or warfarin treatment is not affected and depends on your personal risk (See AFA Fact Sheet Blood Thinning). If you are on aspirin or warfarin this will usually be continued at the time of both the ablation and pacemaker implantation procedures.

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