

## The Scientific Impact of Cardiac Ablation on Atrial Fibrillation

I consider radiofrequency catheter ablation for atrial fibrillation to be one of the most profoundly impactful technological advancements on science in the last twenty years.

Radiofrequency catheter ablation, also sometimes called cardiac ablation, is a procedure that cures the increasingly prevalent cardiac disease known as atrial fibrillation.

Atrial Fibrillation, also commonly referred to as AFib, is an arrhythmia (heart rhythm problem) in which faulty nerves in the pulmonary veins in the left atrium send off unwarranted, interruptive electrical signals in the heart. This causes the heart to have irregularly irregular (irregular without pattern) rhythm. This arrhythmia soon becomes a problem because in addition to causing heavy fatigue, it leads to a five times increase in chance for heart failure, five times increase in chance for stroke, and two times increase in chance for cardiovascular mortality.

The curative procedure for atrial fibrillation is radiofrequency catheter ablation. The procedure starts with the insertion of catheters which pass through arteries or veins and lead into the right atrium of the heart and then passes through into the left atrium where the pulmonary veins are. The catheters are then hooked up to a machine which funnels radiofrequency waves through the catheters. The radiofrequency waves travel through the catheter and deliver a burn to destroy the surrounding tissue, creating a scar which blocks the faulty nerves from sending their erratic electrical signals. After the destruction of the nerve pathway, the rhythm then returns to normal sinus rhythm and the patient, of course, is cured.

There are many causes for atrial fibrillation. Some of them include obesity, alcohol, inactivity, high blood pressure, diabetes, and an overactive thyroid gland. Genetics can also play a part in atrial fibrillation as well.

Atrial Fibrillation is one of the most widespread in the world, affecting 33.5 million people, and 5.5 million in the United States. The healthcare burden is high, with direct medical costs of up to \$44.5 million, and indirect medical costs of up to \$33.1 *billion* in the US alone.

I have been working with Atrial Fibrillation related issues for several years now. I started out working in a cardiac electrophysiologist clinic where I saw first hand the power of cardiac ablation and how it works. I observed an actual ablation procedure in the cath lab. Later, I became one of the junior founders in the AFib Foundation under the guidance of a cardiac electrophysiologist. Our foundation is a non-profit organization dedicated to the education, diagnosis, and management of Atrial Fibrillation.

The scientific advancement and pros that cardiac ablation presents becomes clear when contrasted with the previous alternative: a lifelong dosage of antiarrhythmic drugs, many of which come with a high chance of nasty side effects. For example, Amiodarone commonly used for atrial fibrillation can cause fatal lung damage and turn your skin bluish-gray when exposed to the sunlight. Cardiac ablation, on the other hand, is a medically safe procedure with minimal side effects, and takes only a few hours (compared to a lifetime of medication). It is an actual cure whereas the drugs are just a treatment.

Cardiac ablation and its technology aren't perfect though. There are certain drawbacks or cons to relying on them. For example, the costs are high, as stated before, especially because of the expenses of newer medical technology. Also, cardiac ablation is a surgery, which comes with some risks of its own.

Ultimately, cardiac ablation is a huge modern technological advancement to science and medicine. It is the most effective and straightforward cure to the widespread atrial fibrillation disease.