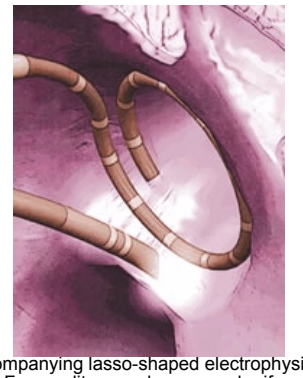
# Atrial Fibrillation 101



Drawing depicting ablation catheter accompanying lasso-shaped electrophysiology mapping catheter during ablation.

It's an odd feeling. Your heart races or skips a beat or feels fluttery. For a split second, you wonder if something is wrong with your heart or if it was just that second cup of coffee. Typically, heart rhythm problems (arrhythmias) are not life-threatening. Most people will experience an occasional, brief rapid heartbeat at some point in their lives. Considering that your heart beats approximately 100,000 times each day, this isn't surprising.

There are times, however, when heart rhythm problems become serious. The most common type of arrhythmia is atrial fibrillation. In a healthy heart, which is divided into four chambers, the atria, or upper chambers, contract and fill the relaxed ventricles (lower chambers) with blood. In less than a second, the ventricles contract and discharge blood as the atria relax and fill. Conducting this dance of pump and prime for each heartbeat is the heart's electrical system. Also known as the sinus node, these electrical impulses initiate the heartbeat.

In atrial fibrillation, the two upper chambers of the heart (atria) are out of sync and beat chaotically. While some people have no symptoms, most experience palpitations, shortness of breath, lightheadedness or fatigue. More than three million Americans have this condition and the vast majority is over the age of 60. As a rule, atrial fibrillation is not life-threatening, although medical research has determined that it can have potentially devastating complications such as stroke, congestive heart failure or enlarged heart. During atrial fibrillation, the atria may beat as rapidly as 300 to 400 times a minute. (A normal sinus rhythm ranges from 60 to 100 beats per minute.) The condition can be intermittent, lasting only a few minutes up to an hour. It may also be chronic, in which symptoms continue until they are treated. Conducting this dance of pump and prime for each heartbeat is the heart's electrical system.

Possible causes of atrial fibrillation include high blood pressure, congenital heart defects, an overactive thyroid, abnormal heart valves, sick sinus syndrome (when the heart's natural pacemaker no longer functions), previous heart surgery, lung diseases and stress due to illness or injury. Age is a major factor in the onset of atrial fibrillation. The older you are, the greater your risk. More than 160,000 new cases are diagnosed each year and 10 percent of the population over the age of 80 will be affected. Color coded mapping system of electrical activation of upper heart chambers during atrial fibrillation allows doctor to locate abnormality.

There are three aspects of therapy for the treatment of atrial fibrillation, according to Andrew Rubin, MD, Co-Director of the Cardiac Arrhythmia Program at the Eisenhower Smilow Heart Center: Control the speed of the fibrillation. Use a blood thinner to minimize the risk of stroke. Determine if the patient needs their heart rhythm restored to a normal heartbeat.

Depending upon the severity, medicines such as beta blockers or calcium blockers are often first in line for treatment of atrial fibrillation to control its speed. However, they do not correct the underlying cause of the disease nor restore a normal rhythm.

Catheter procedures, in combination with a pacemaker, have also proven effective in controlling the speed of atrial fibrillation. Arrhythmia mapping and ablation procedures involve the threading of a small basket catheter through a vein in the groin to the heart, pinpointing the affected areas of the heart, and then cauterizing (ablating) those affected areas. The procedure lasts only about 60 minutes, and can be performed under local anesthesia.

Electrical cardioversion is an effective way to restore the heart to a normal rhythm. Under light anesthesia, the patient receives an electric shock, delivered to the chest through paddles or patches placed on the chest. The shock stops the heart for a split second, and after, the heart returns to its normal rhythm. This can be used in conjunction with advanced medications to attempt to maintain a normal rhythm.

At this juncture, the only real cure for atrial fibrillation involves invasive procedures like advanced ablation techniques or heart surgery, but is recommended typically for people with otherwise strong hearts who cannot tolerate a regimen of medicine.

"Two years ago we completed a study of atrial fibrillation with the National Institutes of Health (NIH)," says Dr. Rubin, enthusiastically. "We learned the importance of using Coumadin® to prevent a stroke when someone seems to have a minimal amount of atrial fibrillation. This is critical because patients have much more fibrillation than they realize."

Currently, Eisenhower Smilow Heart Center is completing a study with the Canadian Institute of Health on atrial fibrillation and is also testing a new medication for atrial fibrillation.

And where will electrophysiology be in five or ten years? Dr. Rubin feels hopeful. "In terms of atrial fibrillation, I think the evolution will be that invasive procedures will be refined, and we'll be able to cure more people and minimize the use of medicines."

On a positive note, Dr. Rubin stresses that if you can prevent the recurrence of atrial fibrillation, the heart's strength can increase over time. What can one do in the meantime to minimize the risk of atrial fibrillation? If you have high blood pressure, treat it. Make sure your thyroid regimen is appropriate, and if you've been diagnosed with congestive heart failure, make sure it is optimally treated.

Good health habits are always an important consideration. The basics apply to everyone: a good diet, plenty of exercise and a moderation of alcohol and caffeine. For most of us, heart healthy habits will help to minimize the risk of future health problems.

The Risks of Atrial Fibrillation As a rule, atrial fibrillation is not life-threatening. However, medical research has determined that it can have devastating complications: stroke congestive heart failure enlarged heart When diagnosed, the three aspects of therapy are: control the speed of fibrillation use a blood thinner to minimize the risk of stroke decide if the patient needs heart rhythm restored to a normal heartbeat Typically, stroke is the greatest concern — thus, the importance of using the blood thinner Coumadin® as an ongoing therapy in the treatment of atrial fibrillation in addition to other recommended treatments. A qualified cardiac electrophysiologist or cardiologist can best determine an individual's best course for treatment.

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