

## **Atrial Fibrillation**

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Atrial fibrillation (AF or AFib), is one of the most common and undertreated heart rhythm disorders in America. The disease, which involves an irregular quivering or rapid heart rhythm in the upper chambers (atria) of the heart, is found in approximately 3 million Americans and 7 million people worldwide.<sup>i</sup> A heart in AF beats significantly faster than a normal heartbeat. When the heart does not contract at a normal rhythm, blood is not pumped completely out of the atria and may pool and clot.

When left untreated, AF patients have a five times higher chance of having a stroke, and are at greater risk of developing heart failure.<sup>ii</sup> Additionally, since AF causes inefficient pumping of the heart, the disease can lead to other heart rhythm problems as well as chronic fatigue. People with other heart rhythm disorders, such as slow heart rates called bradycardia and fast heart rates in the ventricles called ventricular tachycardia, also may have AF.

### **Three Types of AF**

- **Paroxysmal AF** occurs when the rapid rhythm in the heart's upper chambers start and stop suddenly, usually for minutes or days at a time.
- **Persistent AF** occurs when the heart's upper chambers beat erratically for more than seven days and medical intervention or drug therapy is needed to stop the episode.
- **Permanent or continuous AF** occurs when the heart's upper chambers consistently beat erratically at very high rates. This is the most severe form of AF.

### **AF Risk Factors & Symptoms**

The most common risk factor associated with AF is existing heart disease. AF is common among people who suffer from coronary heart disease, valve disease, an inflamed heart muscle or lining, or those who have had a heart attack, congestive heart failure or heart surgery. Other risk factors include high blood pressure, clogged arteries, diabetes, overactive thyroid, emphysema or other lung diseases, viral infections, sleep apnea, stress, fatigue and age.

### **Treatment Options**

While medication has been considered the first-line treatment for AF, clinical research indicates that half of all patients with symptomatic disease fail drug therapy.<sup>iii</sup> New medical technologies have the potential to provide patients with better treatment options and reduce the risks of stroke, heart failure and death.

Following is an overview of various AF treatment methods used worldwide:

- **Medication** for AF patients is designed to regain and maintain normal heart rhythm, control the heart rate (pulse), and prevent stroke.
- **Cardioversion**, traditionally used with persistent AF patients, delivers small, timed electrical shocks to the heart to restore normal rhythms. This procedure is performed while the patient is in the hospital.
- **An implantable defibrillator or pacemaker**, small, stopwatch-sized devices placed under the skin in the upper chest, deliver electrical shocks or painless pacing therapy that can restore the heart's rate and deliver life-saving therapy. With all types of AF patients, implantable devices may be used after an ablation procedure.
- **Cryoablation**, a minimally invasive catheter approach that freezes tissue in the heart's upper chambers, traditionally around the pulmonary vein for AF treatment, to block the conduction of electrical signals that trigger erratic heart rhythms.

- **Surgical Intervention\***, traditionally an open-heart surgical procedure called the Cut and Sew Maze, includes a series of atria incisions in a maze-like pattern intending for the scars to serve as blocks for the abnormal electrical pathways. More common today is surgical ablation on the heart's surface either at the same time as other heart disease treatments (open heart surgery) or stand-alone through a small port-size incision.
- **Radiofrequency (RF) Ablation\***, a minimally invasive catheter approach that delivers radiofrequency energy to destroy the abnormal electrical paths in the heart. RF ablation is the most common interventional (or curative) treatment worldwide for all types of AF. Most AF ablation procedures focus on destroying cells around the pulmonary vein (PV) to block or isolate the abnormal electrical paths.

**\*No Medtronic surgical probes or radiofrequency ablation catheters are currently U.S. FDA approved for the treatment of AF.**

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<sup>i</sup> Millennium Research Report; "Global Markets For Atrial Fibrillation Treatment Devices 2008," March 2008; 1.

<sup>ii</sup> ACC/AHA/ESC Guidelines for the Management of Patients with Atrial Fibrillation

<sup>iii</sup> JAMA 2001; 285:2370-5