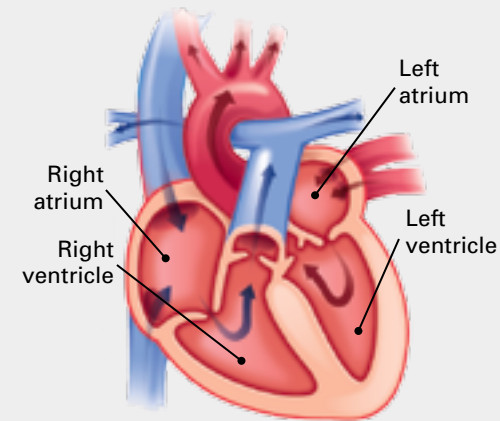


# Understanding Atrial Fibrillation



Your doctor has determined that you have atrial fibrillation (AF), a common disturbance of the heart's rhythm.

This pamphlet will answer many of your questions about AF and how it can be treated. If you have questions about AF after reading this pamphlet, talk with your doctor.



When AF occurs, the upper chambers of the heart quiver rapidly and irregularly. Non-valvular AF is AF not caused by a heart valve problem and is the most common form of AF. To better understand AF and its effects, it's helpful to understand the normal operation of the heart.

### ■ How the heart works

Your heart is divided into four chambers. The two small upper chambers are called the right and left atria (ay-tree-uh). The two larger, lower chambers are called the right and left ventricles (ven-trick-uls). With each beat of your heart, blood is pumped to and from the other parts of your body.

The pumping is controlled by your heart's electrical system. When resting, a normal adult heart usually beats 60 to 120 times per minute.

### ■ Abnormal heart rhythms

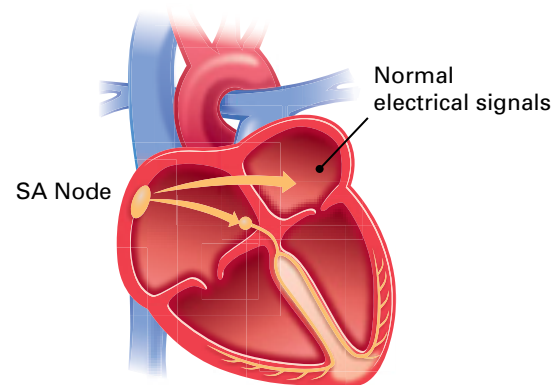
Sometimes, certain conditions can cause the heart's electrical system to make the heart beat too slowly, too fast, or in an uncoordinated fashion.



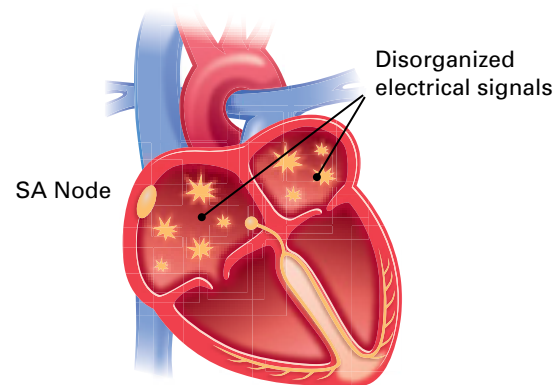
# WHAT ARE THE SYMPTOMS OF AF?

When AF occurs, disorganized electrical signals cause the atria to quiver rapidly and irregularly, instead of beating in a regular rhythm. AF keeps the atria and ventricles from working together properly. This can decrease the heart's pumping efficiency by as much as 20 to 30 percent.

## Normal electrical conduction



## Atrial fibrillation



Normally, the electrical signal that tells your heart to beat comes from the sinoatrial node, or SA node, in the right atrium. But during AF, signals start irregularly from several areas in the atria. These disorganized signals occur so quickly that only some of them are transferred to the ventricles, which may beat irregularly.

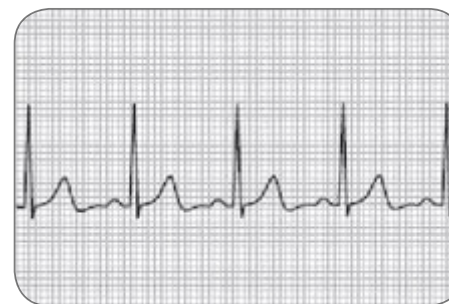
Most people with AF experience one or more of the following symptoms:

- Heart palpitations—sudden pounding, fluttering, or racing feeling in the chest
- Lack of energy, feeling tired
- Dizziness—a feeling of faintness or light-headedness
- Chest discomfort—pain, pressure, or discomfort in the chest
- Shortness of breath

## How is AF diagnosed?

A reliable way to diagnose AF is to record an electrocardiogram (ECG) during an episode of AF. But AF episodes can be unpredictable, so an ECG recorded at your doctor's office may appear to be normal.

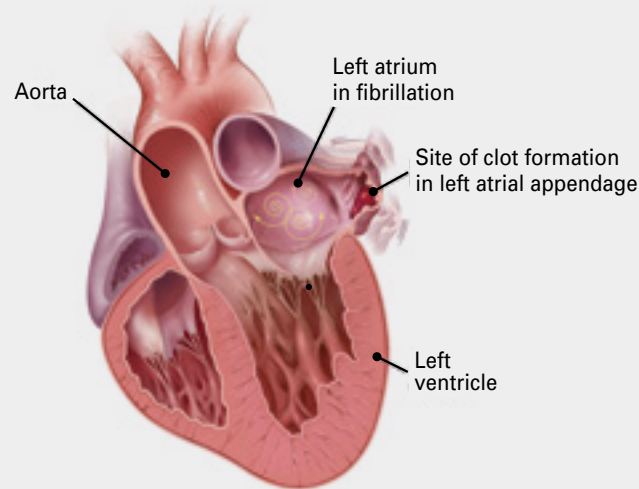
If this happens, your doctor may ask you to wear a portable monitor, such as an event monitor, or a Holter monitor, to record your heart's electrical signals. Your doctor will then analyze the monitor recordings to determine if you have AF.



ECG tracing a normal heart rhythm.



ECG tracing atrial fibrillation (AF). The rhythm is irregular and erratic.



People with untreated AF may be at greater risk for stroke than people with normal heart rhythms. Because blood does not flow through the atria smoothly, blood clots may form in the heart. If a blood clot is dislodged from the heart, it can travel through the bloodstream to the brain and result in a stroke. In non-valvular AF, the left atrial appendage (LAA) is believed to be the source of a majority of stroke-causing blood clots.\*

In addition, untreated AF may lead to a condition known as heart failure. Heart failure is a progressive condition in which the heart muscle has been damaged by disease or injury and cannot pump enough blood and oxygen to meet the body's needs.

## ■ How can AF be treated?

Today a number of treatments are available for AF. Your doctor will help you choose a treatment based on your heart's rhythm, your symptoms, and any other medical conditions you may have.

No matter which AF treatment you receive, the goals may include:

- Regaining normal heart rhythm
- Controlling your heart rate
- Reducing stroke risk

## DRUG THERAPY

To help keep your heart in normal rhythm, your doctor may prescribe one or more drugs, depending on your situation.

To control your heart rate, your doctor may prescribe digitalis, beta-adrenergic blockers, or calcium channel blockers. These medicines may relieve some of the symptoms associated with AF, but they may not prevent an AF episode. This means there is still a risk for stroke and heart failure.

To reduce stroke risk, your doctor may prescribe blood-thinning medications that can reduce the formation of blood clots.

### ■ Drugs commonly used to treat AF rhythm or reduce AF stroke risk not caused by a heart valve problem

- Quinidine
- Procainamide
- Disopyramide
- Flecainide
- Propafenone
- Sotalol
- Amiodarone
- Warfarin (COUMADIN®)
- Rivaroxaban (XARELTO®)
- Apixaban (ELIQUIS®)
- Dabigatran (PRADAXA®)
- Edoxaban (SAVAYSA™)



## LEFT ATRIAL APPENDAGE CLOSURE (LAAC)

The current treatment for patients with AF, not caused by a heart valve problem, who are at increased risk for stroke is treatment with blood-thinning medications, which reduce the chance for blood clots to form. These medications (which include warfarin [commonly referred to as Coumadin®] and other newer approved blood thinners) are very effective in lowering the risk of stroke in AF patients. Most patients can safely take these medications for years (and even decades) without serious side effects.

However, some patients find that anticoagulants can be difficult to tolerate or risky. Because they prevent blood clots by thinning the blood, blood thinners can increase the risk of bleeding problems. In select patients, physicians determine that an alternative to blood thinners is needed to reduce AF stroke risk.

Left atrial appendage closure (LAAC) is an implant-based alternative to blood thinners for patients with AF not caused by a heart valve problem. When a blood clot develops in the heart of a patient with AF, it is most often found within the left atrial appendage, a small pouch on top of the heart. An LAAC implant acts as a barrier to prevent left atrial appendage blood clots from entering the bloodstream and causing a stroke.

It is important to know that a stroke can be due to factors not related to a clot traveling to the brain from the left atrial appendage. Other causes of stroke can include high blood pressure and narrowing of the blood vessels to the brain. An LAAC implant will not prevent these other causes of stroke.

It is also important for you to understand that, like blood thinning medications, an LAAC implant does not cure AF.

Be sure to discuss your specific situation with your doctor as you consider all options to reduce your risk of stroke.

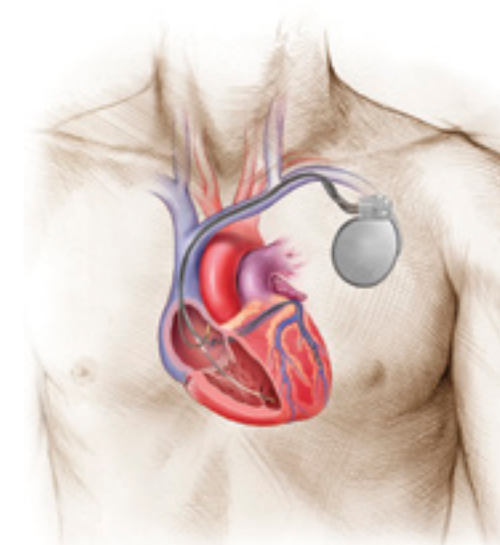


### External cardioversion

Your doctor may recommend external cardioversion to restore a normal heart rhythm. External cardioversion is a high-energy electrical shock delivered to your heart using paddles placed on the chest or on the chest and back. This procedure is usually done in the hospital. You may be given medication to help you relax or sleep before the treatment.

### Internal cardioversion

Internal cardioversion is a treatment that delivers an electrical shock to your heart using catheters. Catheters are soft wires that are inserted through the veins into your heart. This treatment uses much lower energy levels than external cardioversion to restore a normal heart rhythm. Your doctor may prescribe this treatment if your heart rhythm did not return to normal after external cardioversion. Again you may be given medication to help you relax or sleep before the treatment.



### ■ Ablation

Ablation destroys (ablates) targeted portions of the heart muscle. Your doctor carefully chooses portions of the heart muscle to treat. Then your doctor delivers small amounts of energy to these selected areas. This creates lesions (helpful scars) on the heart muscle. In focal AF ablation, the energy from the tip of the catheter is used to stop other areas of the atrium that may cause disorganized electrical activity that results in AF.

Ablation can be done as a type of surgery or as a procedure using a catheter. A catheter is a flexible tube that is inserted into a blood vessel.

Your doctor will decide whether a catheter ablation or a surgical ablation is right for you.

### ■ Catheter ablation

Catheter ablation does not require incisions in the chest. This type of ablation begins with a catheterization. During a catheterization, a small flexible tube called a catheter is inserted through a blood vessel in your groin (or sometimes in your neck). Your doctor gently “steers” the catheter into your heart. Your doctor can see where the catheters are going by watching a video screen with real-time images, or moving x-rays, called fluoroscopy.

The electrode at the tip of the catheter senses your heart’s electrical signals and takes electrical measurements. Your doctor tests your heart and then “ablates” sections of the muscle tissue using the catheter. Catheter ablation can be done using:

- Intense cold, called cryoablation
- High-frequency energy, called radiofrequency ablation

The surgical maze procedure is an operation that is performed to stop AF by preventing disorganized electrical signals from traveling around the atria. Since the surgical maze procedure is performed on the heart, it is usually considered when a patient requires open-heart surgery to treat another heart condition.

After the surgical maze procedure, you may need a pacemaker to help your heart beat regularly.



\*Boston Scientific does not sell any products that are approved by the FDA for the ablation of atrial fibrillation.

Every person with AF has different needs. If you've been diagnosed with AF, talk with your doctor about the treatment options available to you. Your doctor will help you understand the risks associated with each option, and together you can choose the treatment that is right for you.



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