

# Catheter Ablation for Atrial Fibrillation

## About radiofrequency and cryo-balloon ablation

Your doctor may advise you to have a procedure called **catheter ablation** if other ways of treating your atrial fibrillation are not working well. This handout describes 2 ablation procedures: radiofrequency and cryo-balloon ablation. It also gives explains how to prepare for ablation and what to expect afterward.

### What is atrial fibrillation?

*Atrial fibrillation* (AF) is an abnormal heart rhythm, or *arrhythmia*. AF can make your heart beat in a very unsteady pattern. It may make your heart beat very rapidly or very slowly.

When you have AF, the 2 upper chambers of your heart (the *atria*) and the 2 lower chambers of your heart (the *ventricles*) do not work well together. This means blood does not pump smoothly out of your heart to the rest of your body.

Electrical impulses in your heart control your heart's rhythm. AF occurs when there is an extra electrical signal, often from the *pulmonary veins*. These veins carry blood that is full of oxygen from your lungs to your heart.

The extra electrical signal makes the electrical impulses in your left atrium rotate in waves. When this happens, your atria go very fast and cannot pump blood well. This causes your ventricles to beat unsteadily and rapidly. This causes the AF symptoms.

### What are AF symptoms?

AF symptoms include:

- Rapid heart rate
- Irregular heart rate
- Shortness of breath



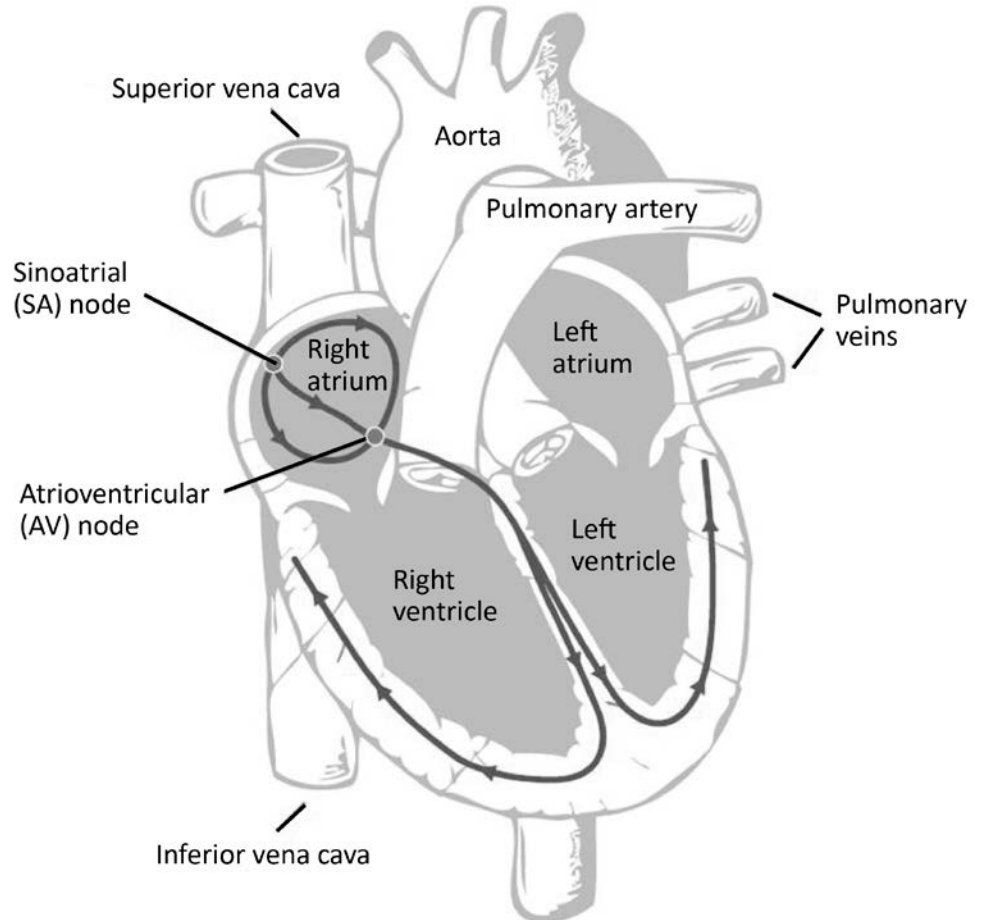
*Ask your doctor if you have any questions about your heart.*

- Being very tired
- Chest pain
- Dizziness, feeling lightheaded, or even passing out
- Fluid buildup or swelling in your legs

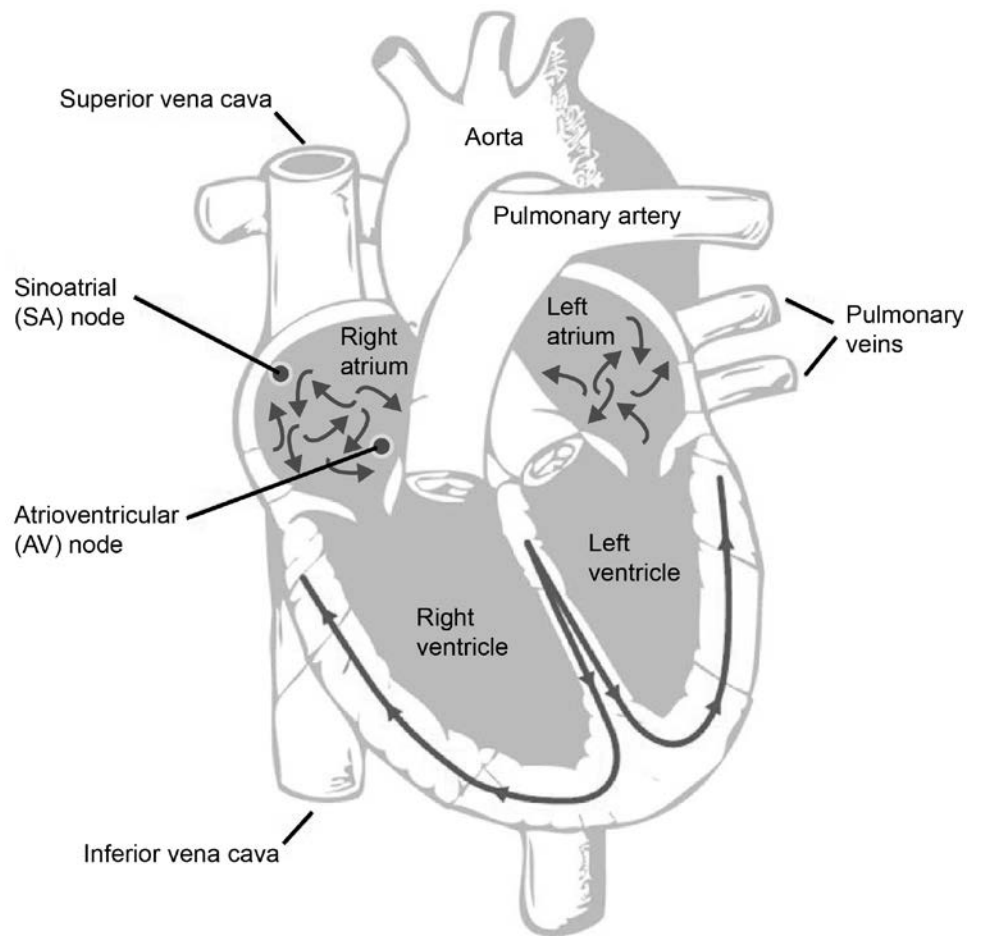
## What problems can AF cause?

AF can cause:

- Poor blood flow in your body.
- A higher risk for blood clots, which increases your risk for stroke.
- A weakened heart. This may cause heart failure or make existing heart failure worse.



***The anatomy and rhythm of a healthy heart:*** The electrical signal starts in the sinoatrial (SA) node, follows the dark lines and arrows to activate the left and right atria, and then moves to the atrioventricular (AV) node. It then follows the dark lines to the ventricles.

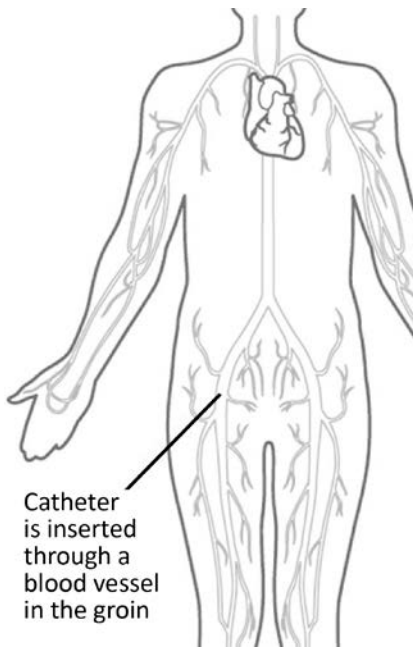


***The anatomy and rhythm of a heart with atrial fibrillation:*** The dark lines show the direction of the electrical signals. The sinoatrial (SA) node is no longer active while the heart is in AF. Instead, as seen by the arrows, the right and left atria have unsteady electrical signals, which causes fibrillation. The electrical signal still goes through the atrioventricular (AV) node and into the ventricles.

## **What is catheter ablation?**

*Catheters* are long, thin, flexible wires. The word *ablate* means “to destroy.” *Atrial fibrillation catheter ablation* uses catheters to destroy the areas in your heart that cause AF.

During your procedure, your doctor will first place several small *sheaths* in a blood vessel in each side of your *groin* (the area where your inner thighs meet your main body). A sheath is a short, thin, flexible tube. The sheaths make it easier to insert the catheters.



*In catheter ablation, long wires are inserted through a blood vessel in each side of your groin.*

When the sheaths are in place, longer catheters are then threaded through them and up to your heart. Different types of catheters are used to make sure the procedure is successful.

## The 2 Types of Catheter Ablation

### Radiofrequency Catheter Ablation

*Radiofrequency* catheter ablation destroys the portion of your heart just outside the pulmonary veins. It uses heat (*thermal energy*) to “burn” the tissue in the area. The burned tissue creates a scar and stops electrical signals from entering or leaving your pulmonary veins. This stops AF from recurring.

### Cryo-balloon Catheter Ablation

“Cryo” means cold or freezing. *Cryo-balloon* catheter ablation destroys the tissue that causes AF by “freezing” it with a very cold liquid. This liquid is inside a tiny balloon that is placed in the pulmonary veins for a short time. The tissue that is frozen also creates a scar and stops electrical signals from entering or leaving your pulmonary veins. This stops AF from recurring.

## Is catheter ablation right for me?

Catheter ablation works best for people who have short episodes of AF fairly often. Some people who have the procedure still have AF afterward. But, the episodes usually occur less often and are better controlled with medicines than they were before the procedure.

People who may be considered for catheter ablation:

- Have AF symptoms that come and go or have them all the time
- Have AF episodes even when taking their prescribed medicines
- Cannot take these medicines for any reason or do not want to take them over a long time
- Have both AF and heart failure

## When is catheter ablation not a good choice?

Not all patients with AF need catheter ablation to ease their symptoms and improve their quality of life. Your doctor may **not** advise catheter ablation for you if you:

- Have AF but you do not have any AF symptoms
- Have had AF for a long time

## What happens during ablation?

During an ablation, your doctor (a specialist called a *cardiac electrophysiologist*) will place several small catheters through veins in your groin and carefully move them into your heart.

### Radiofrequency Ablation

In a **radiofrequency** ablation, a catheter is used to create many small burns side by side. Enough burns are made to go around all 4 of your pulmonary veins in your left atrium. These burns stop electrical signals from going into or out of your pulmonary veins. Other areas in your atrium may also be ablated to increase the success of the procedure. The procedure usually takes 3 to 5 hours.

### Cryo-balloon Ablation

In a **cryo-balloon** ablation, a balloon with cold liquid is carefully moved to the parts of the pulmonary veins where they enter into your heart. The cold liquid freezes a circle of tissue around all 4 of your pulmonary veins in your left atrium. This procedure usually takes 3 to 5 hours.

If you need more treatments in your atrium to increase the success rate of the procedure, your doctor may also use radiofrequency catheter ablation.

## Will I have anesthesia during my procedure?

You will have *general anesthesia* during your ablation. This medicine will make you sleep. A doctor called an *anesthesiologist* will give you the anesthesia and will monitor you during your entire procedure.

You will not feel any pain during the procedure, and afterward, you may not recall much of what happened the day of your procedure.

## How does ablation stop AF?

Skipped beats, called *premature atrial contractions* (PACs), come from within the pulmonary veins. They cause the heart to go into AF. Ablation creates a scar or barrier outside the pulmonary veins to stop AF from recurring. This scar may take 2 to 3 months to fully form.

Because the scar-healing process is slow and there is tissue inflammation at the ablation sites, you may still have AF early in your recovery. If your AF lasts more than 12 hours during this time,

your doctor may advise you to have a *cardioversion* to get your heart rhythm back to normal. A cardioversion is an electric shock to your heart to restore a normal heart rhythm.

Sometimes the effects of the ablation do not last, and the AF returns. If this happens, you may need another ablation procedure. About 25 in 100 people (25%) need to have another ablation procedure to prevent AF from returning.

## What tests will I have before my ablation?

You will have many tests to help us decide if ablation is the best treatment for you. These tests will examine your heart structure and function. You may have:

- **Echocardiogram** – an ultrasound to look at the structure of your heart and blood flow in your heart.
- **Electrocardiogram** (ECG or EKG) – to measure electrical activity in your heart.
- **Home ECG monitoring** – a small device that records your heart rate and sends results to a monitoring station. This device is also called a Holter monitor or an event monitor.
- **Cardiac MRI (magnetic resonance imaging) or CT (computed tomography) scan** – imaging scans that create detailed pictures of your heart and show its structure.

## What are the risks of catheter ablation?

Catheter ablation is a low-risk procedure. But, problems that may occur can be serious. It is important to understand the risks and compare them to the risks and benefits of other therapies that may be done to control AF. Please take the time to talk about your concerns with your electrophysiology doctor and others on your healthcare team.

### Most Common Risks of Ablation

Some of the most common risks of having catheter ablation are:

- **Bleeding and oozing** from your veins where the catheters are inserted. Bleeding is a risk with all heart catheterization procedures. It is usually controlled well by putting direct pressure on the sites where the catheters go into your veins. If needed, this rare problem can be repaired by surgery.

- **Heart puncture and bleeding through your heart walls.**  
During the ablation procedure, a tiny needle is used to puncture the membrane between your right and left atria. This puncture, along with how much the catheters are moved, increases the chance of poking a hole through your heart. If this happens, blood may ooze from your heart and fill the sac around your heart. If a lot of blood collects in the sac, the blood will need to be removed. Usually this can be done with a needle and catheter. Very rarely, surgery is needed to remove this blood.
- **Stroke** may occur as a result of a blood clot that forms during the procedure and moves to your brain. A clot may form simply from moving the catheters around the left atrium while doing the ablation. We keep this risk as low as possible by giving you *heparin* through an *intravenous* tube (IV) in your vein during your ablation procedure. Heparin is a blood-thinner medicine. Many people who have ablation are already taking *anticoagulation* medicine (warfarin, dabigatran, rivaroxaban, or apixaban) to prevent clots. This also helps reduce the risk of a stroke.
- **Pulmonary vein stenosis.** When your doctor ablates the edges of the pulmonary veins, there is a risk of damaging and narrowing them. This narrowing is called *stenosis*. If a lot of narrowing occurs, you may need to have another procedure to stretch the narrowed area or to place wire mesh or a *stent* (a type of tube) to keep your veins open.

### Less Common Risks of Ablation

These risks happen rarely:

- **Damage to your *esophagus*** (the tube that food goes through from your mouth to your stomach). This is because your esophagus is close to the left atrium of your heart.
- **Damage to the nerve that controls your stomach.** This can cause food to empty from your stomach more slowly than it did before.
- **An allergic reaction to medicines** that are used during your ablation procedure.
- **Infection.**
- **Heart valve damage.**

- **Heart attack** caused by the procedure itself.
- **Damage to your phrenic nerve**, the nerve that controls the *diaphragm* (the large muscle that separates your abdomen from your lung area). Rarely, ablation may “stun” the phrenic nerve for a short time. This may cause less movement of your diaphragm after your ablation procedure. If the phrenic nerve is damaged, it usually heals on its own and symptoms go away over time. The symptoms linked with phrenic nerve injury are some shortness of breath, fatigue, and not being able to take deep breaths.
- **Death.** There is a very small chance that an unexpected problem could cause death.

Our staff and doctors are trained to deal with emergencies and problems. We do everything possible to monitor you during your procedure and lower your risk of problems. Even with careful monitoring, 3 to 4 people out of 100 (3% to 4%) who have the ablation procedure will have a problem occur.

### **What are the risks of not having catheter ablation?**

- Ongoing, short episodes of AF may cause electrical and structural changes in the atrium. These changes can lead to more and more episodes of AF. If it is not treated, these short bursts of AF may become longer and longer until the AF occurs all the time. This may take months or years to develop.
- If AF is not treated, there is the risk of stroke in the future.

### **About Your Procedure and Recovery**

If you decide to have an ablation procedure, you will receive detailed instructions about how to prepare for it and what to expect during your recovery. Here are the answers to some questions you may have:

#### **How long will I be in the hospital?**

Most people stay in the hospital for 1 night after their ablation. How long you are in the hospital will depend on how long it takes to adjust your medicines and the results of your *telemetry* monitoring.

Telemetry is a type of ECG that records your heart rate and rhythm. The telemetry readings will tell your doctors when you are ready to leave the hospital.



## **When can I stop taking anticoagulation medicine?**

Depending on your risk of stroke, you will need to keep taking an anticoagulant for at least 2 to 6 months after your procedure. Some people need to take it up to 1 to 2 years, and some need to take it for the rest of their lives.

## **Do I need to keep taking my anti-arrhythmic and rate control medicine after my ablation procedure?**

Before you leave the hospital, your doctor will decide if you should resume these medicines. If you start taking any of them, your doctor will talk with you about tapering or stopping them 3 or 6 months after your ablation. This will depend on the type of AF you had, your recovery, and if your AF returns.

## **Follow-up Visits and Care**

You will have follow-up visits about 2 weeks, 3 months, 6 months, and 1 year after your ablation. You will receive a 1-page handout that tells you when and where these visits will be.

Your doctor may also advise you to have certain tests to monitor your progress after your procedure.

## **What if I still have questions?**

Please talk with your doctor, nurse, or other healthcare provider if you:

- Have questions about anything this handout did not explain
- Do not understand something in this handout
- Want to talk with your doctor about the ablation procedure, your AF, or anything else

Your doctor, nurse, or other healthcare provider will be happy to talk with you about any questions or concerns you may have.

### **Questions?**

Your questions are important. Call your doctor or healthcare provider if you have questions or concerns.

UW Medicine Contact Center:  
206.520.5000