

*If you have
any questions
or concerns,
please ask your
physician or
nurse.*

Radiofrequency Ablation (Cardiac)

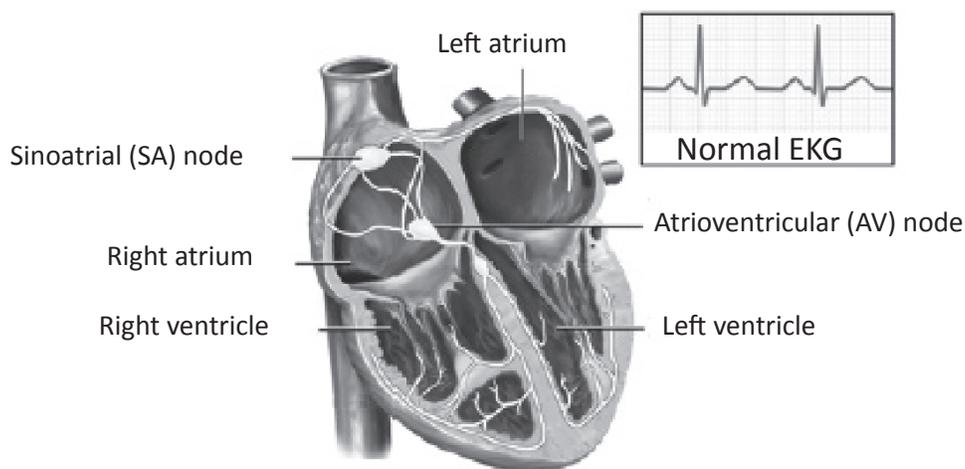
Your physician has suggested that you have a radiofrequency (RF) ablation. An RF ablation is a non-surgical procedure. It can locate and destroy abnormal pathways in the heart that cause fast heart rhythms. Both the diagnosis and the cure can be done at the same time. An RF ablation is done in the Electrophysiology Laboratory (EP Lab). The heart rhythms described in this brochure may be treated by using RF ablation.

This information is provided to help you understand your heart, its electrical system and the RF ablation procedure.

The conduction system

With each heartbeat, the heart pumps oxygen-rich blood through the body. It needs a “spark plug” or electrical impulse to start a heartbeat. The heart receives this electrical signal from the sinus node in the upper chamber or right atrium (see Figure 1). This signal or spark starts the electrical activity along its path or circuit. The signal then travels through the upper chambers (atria) along a path to the lower chambers or ventricles.

Figure 1. Heart Conduction System



This electrical circuit makes the heart contract and pump blood throughout the body. When the circuit follows this normal path, it is called “normal sinus rhythm.”

Tachycardia

Tachycardia is a fast heartbeat that may cause dizziness, palpitations or fainting, also called syncope. If the heart beats too fast, there is not enough time for the ventricles to fill with blood and the pumping becomes less effective. Tachycardias can begin either in the atria, the upper heart chambers, or the ventricles, the lower heart chambers.

Supraventricular tachycardia

Supraventricular tachycardia (SVT) is a fast heart rhythm that begins in the upper chambers of the heart. SVT occurs in about 1 out of 100 people. It may occur during infancy, but most often it appears between the ages of 10 and 30. It can affect people of all ages.

Usually, SVT is due to a short circuit in the heart's electrical signals, causing the heart to beat faster. Symptoms may include palpitations, dizziness, chest pain, clamminess and shortness of breath. Common forms of SVT include:

- **A-V (Atrial-Ventricular) node re-entry**

A-V node re-entry is the most common type of SVT treated with RF ablation. The cause of this rhythm is an extra pathway or "fork in the road" for electrical impulses to travel. This fork is located within the A-V node tissue. Under certain conditions, the electrical impulse travels down one side of the fork and then back up the other side. The result is electrical impulses rapidly going around in a circle. This causes a fast heart rhythm.

- **Wolff-Parkinson-White syndrome**

This syndrome is caused by an extra pathway that electrical impulses take, but its location varies. A bypass tract is a hair-like tissue that conducts electrical impulses. This tract connects the upper chambers with the lower chambers, on the left or right side of the heart. Sometimes an impulse travels down the normal pathway and back up the abnormal bypass tract. This creates a rapid circle of electricity, causing a fast heart rhythm.

- **Atrial fibrillation**

Atrial fibrillation (AF) is a common form of SVT that affects more than 2 million people in the United States. In this condition, the atria of the heart quiver due to chaotic, uncoordinated electrical activity that occurs through the atria. This results in rapid and irregular impulses in the atrium (up to 300 per minute). As a result, the heartbeat becomes very irregular. It usually is not life-threatening. However, if it is prolonged, AF can lead to stroke or heart muscle damage. Generally, people with AF have palpitations (the feeling that the heart is fluttering or pounding in the chest). They sometimes feel dizzy, faint or short of breath. Some patients report a feeling of sharp anxiety.

- **Atrial flutter**

Atrial flutter usually occurs because of changes in the atrial muscle, such as slowing of the conduction of electrical impulses through the atrium. In atrial flutter, the abnormal heart rhythm starts in the atria. The typical atrial flutter is an abnormal electrical circuit around the heart's tricuspid valve, between the right atrium and right ventricle.

Ventricular tachycardia

Ventricular tachycardia (VT) is the most dangerous of the heart rhythm disorders. These fast heartbeats start in the ventricles. At times, VT can change into ventricular fibrillation. Ventricular fibrillation is life-threatening. This chaotic electrical activity causes the heart to quiver rather than contract. Ventricular tachycardias often occur in patients who have damage from a heart attack, cardiac surgery or inherited disorders. Sometimes they occur in people who have no prior diagnosed heart condition.

Treatment options

Medication

Patients with these conditions may be treated with medication. The goal is to prevent the fast heart rhythm or to slow the heart rate. However, many people complain of side effects, such as fatigue and poor tolerance for exercise. Some may still have periods of SVT or VT while on medication. Some patients wish to avoid daily medications altogether.

RF ablation

RF ablation may be done if other treatments for AF have not worked. It is a non-surgical procedure done in the EP Lab. The procedure takes about 4 to 6 hours followed by an overnight hospital stay in the Cardiac Recovery Observation Unit.

This procedure involves inserting several small tubes called catheters through a vein or artery and into the heart. The physician uses special equipment to watch the catheters and locate the abnormal pathway. Once found, the pathway is destroyed with RF energy. This burning, or ablating, prevents the pathway from conducting electricity that causes the fast heart rate.

Before the procedure

Before the RF ablation, you may be scheduled for several tests. These may include:

- Blood tests
- Electrocardiogram (ECG)
- Transesophageal echocardiogram (TEE)
- 24-hour Holter monitor
- Magnetic resonance imaging (MRI)
- Exercise stress test

These tests provide basic information about your heart function. Your nurse can tell you more about these tests.

Your physician will discuss the benefit and risks of the procedure in detail. Risks include:

- Bleeding
- Blood clots or stroke
- Damage to the blood vessels or heart

You will be placed on a heart monitor during your hospital stay. Medications that affect the heart (called antiarrhythmics) may be stopped before the procedure. Your physician will decide if this is needed. It is important to be aware that stopping medications may bring on symptoms such as:

- Palpitations (heart is racing or skipping beats)
- Dizziness
- Shortness of breath
- Chest pain

If you have any of these symptoms, notify the nurse or physician right away.

A physician from the Electrophysiology Department will visit you before your RF ablation to explain the procedure and the possible risks involved. After the physician has answered your questions, you will be asked to sign a consent form.

The night before the test, you will be asked not to eat or drink anything after midnight. You may take sips of water with any medication ordered by your physician. Just before the test, you will be asked to empty your bladder. Underwear and pajama bottoms must be removed. Glasses, dentures or hearing aids may be worn during the test.

The EP Lab is on the 8th floor of the Galter Pavilion at 251 East Huron Street. During the study, your family can wait in the 8th floor visitors' waiting room. They will be called when you return to your room. Please do not bring any valuables with you to the lab. Either leave valuables at home or with a trusted family member or friend.

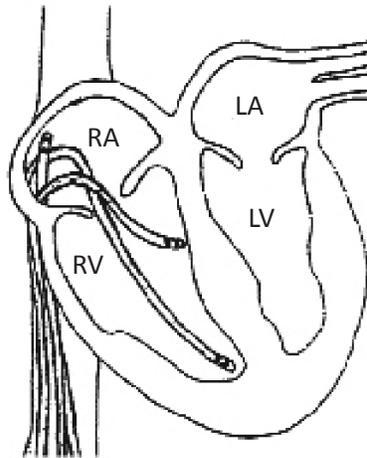
During the procedure

The RF ablation will be done in a room that has many heart monitors and machines. A specially trained team of physicians and nurses will be with you during the entire test. The EP nurses will connect you to several heart monitors. An IV (into the vein) line may be placed in your arm if you do not already have one. It will be used to give you any medicine you need during the test. You will also be given IV medicine to keep you relaxed and comfortable during the procedure.

Most often, your groin will be used for catheter placement. In some cases, your inner arm or neck area may also be used. The site will be shaved and washed with special soap, and then covered with sterile sheets. The physician will inject a numbing medicine at the site. You will feel some burning as the medicine is given, but once it takes effect, the site will be numb.

Several small tubes (electrode catheters) will be placed into the vein and/or artery in your groin. X-ray is used to position these electrodes into the heart chambers (see Figure 2).

Figure 2. Catheters in the Heart Chambers



These electrodes help the physician find the exact spot of the abnormal electrical pathway. Once this pathway is found, the ablation catheter is placed on or very close to the abnormal tissue. High-frequency electrical energy travels through the catheter to destroy the tissue and the abnormal pathway. You may feel a slight burning sensation in your chest when the RF energy is used.

The RF ablation takes place only after your fast heart rate has been started and stopped several times. This process is called mapping.

During the procedure, the physicians will be discussing your heart rhythm with the EP staff. A clinical specialist from the medical equipment company also may be present. The mapping and ablation portion of the test can be completed in 2 hours. Sometimes it takes up to 6 hours for more complex ablations, like AFib or VT ablations.

After the procedure

Once the procedure is over, the catheters and tubes will be removed. When the tubes are removed, the physician will hold pressure at the site to prevent bleeding.

After the procedure, you will be taken back to your room, where your heart rhythm, vital signs and pulse will be checked frequently. You will be on bedrest for 4 to 6 hours. It is important to keep your leg straight and motionless to prevent bleeding. You will be able to eat regular meals and raise the head of the bed 30 degrees.

Tell your nurse right away if you:

- Feel numbness or tingling in your leg
- Notice bleeding from the groin site
- Have groin pain or pain at the catheter insertion site

As the numbing medicine wears off, you may feel minor discomfort at the tube sites. If this occurs, inform the nurse and a pain reliever can be given. After the period of bedrest is finished, your nurse will assist you out of bed and to walk in the hallway.

Possible risks

Radiofrequency energy is a safe method of ablation; however, there is always a chance of complications. Your physician will discuss the risks of the procedure with you in detail. The main risks of RF ablation are:

Bleeding (hematoma)

Bleeding may occur at the sites where the tubes are placed because your blood vessels have been punctured. When the tubes are removed, pressure is held at the site until bleeding stops. To decrease the chance of bleeding, you will be on bedrest for several hours after the procedure. The catheters inserted into the heart rarely cause internal bleeding. Your physicians will take care of this problem if it arises.

Thrombosis (blood clot)

When the tubes are removed, pressure is held at the sites to allow a small blood clot to form. This is normal and prevents bleeding. There is a slight risk that other blood clots may form in these blood vessels, causing a blockage. Blood-thinning medication is used during ablation to prevent blood clots.

Infection

It is rare for an infection to occur inside the heart or at the tube insertion site.

Radiation

Radiation is needed to place the catheters in the correct areas of your heart. The ablation should not be done if there is any chance you might be pregnant.

Heart block

If the abnormal pathway is near your normal conduction system, there is a chance that the normal pathway could be damaged during the ablation. If this happens, a cardiac pacemaker may be needed after your ablation.

At home

After your EP Lab procedure, the following information will help your recovery.

Diet

You may resume your regular diet at discharge. Do not drink alcoholic beverages for 24 hours.

Activity

It can take up to 14 days for the artery to heal completely. During this time, bleeding or swelling can occur if the abdominal or groin muscles are strained.

- On the day of discharge, limit your activities and get plenty of rest.
- Do not drive for 24 hours.
- You may resume your usual daily activities the day after discharge. This includes normal social activities.

- Do not do physical exercise or heavy lifting (greater than 10 pounds) for 1 week. Consult your own physician or the EPS lab physician before resuming strenuous physical activity or your regular exercise program.
- Care should be taken to limit muscle strain when sexual activity is resumed.

Wound healing

The healing puncture site should remain soft and dry. A small bruise or tiny nodules may be present. Please call your physician or the EP Lab physician if you notice any of the following:

- Increased bruising extending to the thigh, over the buttock and/or groin
- Pain at the groin site that is getting worse
- Fever over 101.5 degrees F for more than 1 day
- Drainage from the site
- Redness or red streaks on the skin around the wound.
- Numbness or tingling in the foot, thigh or leg
- Swelling of the ankle and/or foot
- Color change and/or coolness of the leg or foot
- Calf tenderness or pain.

When to call the physician

Please call your physician **right away** if you have:

- Chest discomfort or pain that radiates to your neck, jaw or arm
- Severe persistent nausea, vomiting or profuse sweating
- Shortness of breath with exertion
- An irregular heartbeat
- Lightheadedness or dizziness that makes you lie down
- A fainting spell

If you cannot reach your physician, call 911 or go to the nearest emergency room.

Bleeding

If you notice a small amount of bleeding or oozing from the puncture site, please do the following:

- Immediately lie flat.
- Apply firm pressure just above the puncture site for 15 minutes. You may use a clean cloth or tissue to apply pressure. If possible, have another person apply pressure.
- After 15 minutes, remove pressure. The wound should be dry and flat without bleeding. Cover the wound with a Band-Aid®. Call your physician right away.

If the bleeding does not stop, go to the nearest emergency room or call 911.

Arterial bleeding

Although rare, this is an emergency and needs immediate medical attention. The following signs could mean that the puncture in the artery has reopened and that there is bleeding.

- Quickly increasing swelling of the area around the wound which may be pulsating
- Continuous blood streaming from the wound
- A jet of blood pumping from the puncture wound

Immediately lie flat, apply hard pressure above the puncture site and call 911.

Contact information

If you have questions or concerns, do not hesitate to call us at the following numbers:

- Electrophysiology Cardiology Clinic at **312.695.4965** during business hours Monday to Friday 8 am to 4 pm.
- On nights and weekends, call 312.695.4965 and ask the operator to page the EP Lab fellow on-call.
- You may also call Northwestern Memorial Hospital at 312.926.6999, and ask the operator to page the EP Lab fellow on-call.

Northwestern Medicine – Health Information Resources

For more information, contact Northwestern Memorial Hospital’s Alberto Culver Health Learning Center (HLC) at hlc@nm.org, or by calling 312.926.5465. Health information professionals can help you find the information you need and provide you with personal support at no charge.

For more information about Northwestern Medicine, please visit our website at nm.org.

Para asistencia en español, por favor llamar al Departamento de Representantes para Pacientes al 312.926.3112.

The entities that come together as Northwestern Medicine are committed to representing the communities we serve, fostering a culture of inclusion, delivering culturally competent care, providing access to treatment and programs in a nondiscriminatory manner and eliminating healthcare disparities. For questions, please call either Northwestern Memorial Hospital’s Patient Representatives Department at 312.926.3112, TDD/TTY 312.926.6363 or the Northwestern Medical Group Patient Representatives Department at 312.695.1100, TDD/TTY 312.926.6363.

Developed by: NMH Electrophysiology Nursing Staff with Interventional Radiology