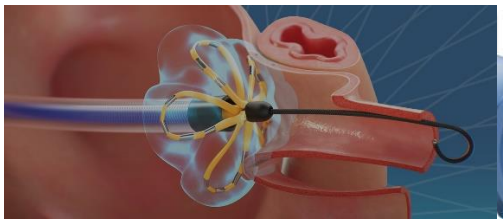
Metropolitan
Heart & Vascular Institute

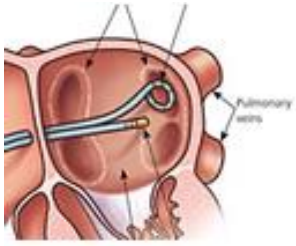
# CATHETER ABLATION FOR TREATMENT OF ATRIAL FIBRILLATION

**What is AF ablation?** Treatment with catheter ablation is an option for some patients who have atrial fibrillation (AF) which is difficult to control with medications. Atrial fibrillation is frequently initiated by extra electrical signals that come out of the pulmonary veins which connect the lungs to the heart, specifically the left atrium. During an AF ablation (also called pulmonary vein isolation) a steerable catheter delivers either high voltage electrical impulses (pulse field ablation), cold energy (cryoablation) or heat energy (radiofrequency ablation) to electrically deactivate heart tissue around the pulmonary veins in the left atrium. Once this is successfully done, these electrical signals cannot jump out of the pulmonary veins and start atrial fibrillation. Which type of ablation your heart rhythm specialist chooses will be based on your type of atrial fibrillation, whether it is a repeat ablation, or if other heart rhythm conditions such as atrial flutter or atrial tachycardia also need to be treated.



*Pulsed field ablation (PFA) uses high voltage electrical impulses to specifically render heart tissue electrically inactive.*

*Cryoablation uses cold energy to deactivate heart tissue, similar to how freezing therapy is used to kill warts.*



*Radiofrequency ablation uses heat energy.*

**Who is a good candidate for AF ablation?** Most patients choose to undergo AF ablation because they are highly symptomatic while in atrial fibrillation. Usually, these are people whose AF symptoms are not well controlled on medications, or people who cannot tolerate medications due to side effects.

**How successful is AF ablation?** Success rates may vary from center to center, depending on how the procedure is performed. For paroxysmal or intermittent atrial fibrillation, success rates may be up to 80%, if the endpoint is to achieve regular rhythm without antiarrhythmic drugs. The medical literature tells us that up to a quarter of these patients may need a touch-up procedure after the first ablation to achieve this success rate. Success rates for persistent atrial fibrillation (the type that does not stop on its own once it starts) can be lower.

**What are the risks of AF ablation?** The risk of complications from AF ablation may vary from center to center, depending on how the procedure is done. Serious complications of AF ablation tend to be low. Potential risks are heart perforation (1%), stroke or TIA (<1%), pulmonary vein stenosis (scarring around the pulmonary veins, 3 in 1000), atrio-esophageal fistula (1 in 2500), death (1 in 1000), and other bleeding complications that may require a blood transfusion (<1%).

With use of cryoablation, temporary injury or trauma to the nerves of the diaphragm can be seen, but most of these resolve and <1% actually become permanent. Many precautions are taken during the procedure to prevent and minimize these potential risks.

PFA, because it is specific for heart tissue, has virtually eliminated risk of atrio-esophageal fistula, pulmonary vein stenosis, and phrenic nerve injury. But with this new ablation technology there are some rare complications of spasm of coronary arteries (0.14%) and hemolysis which is destruction of red blood cells (0.03%).

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**What needs to happen before an AF ablation?** Some patients may be required to take oral blood thinners like warfarin (Coumadin), dabigatran (Pradaxa), apixaban (Eliquis), or rivaroxaban (Xarelto) before and after the procedure. A CT or MRI scan of the heart is required to accurately assess the each patients individual anatomy of the heart and pulmonary veins. The day before the ablation, transesophageal echo (TEE) is may be done in some patients to make sure there are no clots in the heart heading into the ablation procedure. Certain cardiac medications may need to be held a few days before the ablation.

**How is the procedure done?** At our center, patients either receive short acting intravenous sedatives to sleep and stay comfortable (moderate sedation) or general anesthesia. Which of these is chosen will be based on patient and procedural considerations. Once the patient is anesthetized or sedated, small IV catheters are inserted into an artery and veins in the groin region. Small flexible catheters are introduced through these IV catheters in the veins that lead to the heart, where they will monitor electrical signals, create ultrasound images of the heart, and deliver therapy. Under x-ray and ultrasound guidance one small access is made through a thin membrane in the heart to get from the right atrium to the left atrium and the pulmonary veins. Procedure times are generally 2-4 hours, but can sometimes extend longer if more testing and additional treatments are needed to maximize chance of success.

**What to expect after AF ablation.** After an AF ablation, the patient will wake up from anesthesia or sedatives and after IV tubes and catheters are pulled out of the legs, he or she will need to lie flat in bed for a few hours. Most patients can be safely discharged home the same day. However, certain patients may be asked to be observed overnight if the doctor thinks this is the safest option for him or her.

Within the first week patients may experience mild chest discomfort. This is often due to inflammation in the heart from the ablation itself. Most of the time this can be controlled with acetaminophen (Tylenol) or ibuprofen (Motrin, Advil) or colchicine, another anti-inflammatory drug. There may also be some discomfort in the groin sites that will go away within 1-2 weeks. Patients may sometimes experience short bouts of palpitations lasting from seconds to minutes, and rarely up to a few hours. This results because the heart is irritable and the full effects of the ablation itself may take weeks to months to be realized, as permanent scar slowly forms in the heart around the pulmonary veins after ablation.

*Patients should call us immediately at 763-427-9980 after the procedure if they experience bleeding or swelling from the groin sites, severe shortness of breath, persistent heart racing, dizziness or fainting, neurologic changes (focal weakness, slurred speech, visual changes, etc.), fevers, difficulty swallowing,or coughing up of blood*. Patients are asked to refrain from lifting > 10 pounds or engaging in rigorous activity for 2 weeks after ablation. Our typical recommendation is for patients to return to work about 3 days after the procedure for patients who receive short acting sedatives and about 5-7 days afterwards for those who receive general anesthesia.

**Follow-up after AF ablation.** Patients typically follow up in the Heart Center 3 months after the procedure. We generally ask patients to continue taking their antiarrhythmic drugs for at least 3 months after ablation as it may take that long for permanent scar formation to occur from the ablation therapy. Blood thinners like warfarin (Coumadin), dabigatran (Pradaxa), rivaroxaban (Xarelto), or apixaban (Eliquis) are usually continued for at least 2-3 months after ablation. For those patients at high risk for stroke or with previous history of stroke, these blood thinners may be continued long-term even after the ablation. A few months after the procedure patients may be asked to wear an outpatient heart rhythm monitor for 2 weeks to monitor for atrial fibrillation and other arrhythmias.

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PATIENT AND FAMILY INFORMATION.

**At the Hospital.** On the day of ablation, please first register in the first floor of the Heart Center and then go up to the third floor. You will be greeted by 3 Heart staff who will escort you to your pre-procedure room. Here you will have your IV started and your blood drawn. Prior to the procedure you will meet a nurse practitioner (NP) or physician assistant (PA) for a brief pre-procedure assessment. You will then be moved to the procedure room for the ablation. Family and friends may be offered to stay in the pre-procedure room or a separate waiting room while the patient is undergoing his or her procedure.

Depending on the type of procedure your electrophysiologist chooses, you will receive conscious sedation with use of short acting IV sedatives to be administered by a nurse, or general anesthesia to be administered by an anesthesiologist. Once you are sedated or anesthetized, you will not have any discomfort and, and you may have no memory of the procedure itself. Several soft flexible catheters will be placed into the heart through veins in your leg, and occasionally in your shoulder or neck. Patients who receive general anesthesia will usually have a bladder catheter placed after they are under anesthesia.

We anticipate the procedure to take 2-4 hours, but this can sometimes be longer if more testing and additional treatments are needed to maximize chance of success. If more than one arrhythymia is found and more ablation is required, procedure times can increase significantly. Once the procedure is completed, your proceduralist will meet with your family or representative in a private room to review the procedure and answer any questions they may have.

At the conclusion of the case the patient is usually transferred to the 3 Heart pre and post-procedure area or Post Anesthesia Care Unit (PACU). Occasionally a mechanical device may be used to apply pressure for longer periods of time. You will be asked to lie flat on your back with your head elevated a little for about 3-4 hours after the tubes are pulled.

Most patients can safely be discharged home the same day of ablation. However, based on the length of the procedure, type of the procedure, time of day, or other safety considerations, the doctor want to keep the patient for overnight observation.