

Only One Heart. Only One **You.**



Patient Guide to
**ATRIAL FIBRILLATION
& FLUTTER**



**Arrhythmia Associates
of South Texas**
BHS PHYSICIANS NETWORK



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Introduction

Atrial fibrillation and flutter are two of the most common heart rhythm disorders in adults. Left untreated, they increase the risk of stroke, heart failure, and may increase mortality. Fortunately, we have many therapies that can help control and manage atrial fibrillation and flutter.

Arrhythmia Associates of South Texas is a group of heart rhythm specialists dedicated to improving the lives of patients with heart rhythm disorders. We offer a full array of services to diagnose and treat heart rhythm problems combining advanced technology and techniques with a personalized approach.

Although we treat patients with all types of heart rhythm disorders, including supraventricular tachycardia, ventricular tachycardia, pacemakers, and defibrillators, treating patients with atrial fibrillation and flutter is a cornerstone of our practice and our passion. Over the years we have advanced the treatment of patients with these disorders significantly, beginning with our use of Stereotaxis, an innovative robotic magnetic catheter ablation system in 2012. In 2015, we began performing fluoroless ablations for atrial fibrillation and flutter, so patients are not exposed to radiation during the procedure. We started implanting the Watchman left atrial appendage occlusion device in 2016, which is an alternative to prescription blood thinners in patients that are at high risk for bleeding. We then helped the Baptist Health System open a dedicated Electrophysiology Unit designed specifically for treating patients with heart rhythm disorders and helped them achieve the "Get with the Guidelines" Gold level recognition for atrial fibrillation from the American Heart Association in 2017.



We have developed this educational booklet in partnership with the Baptist Health System to help provide you with a basic understanding of atrial fibrillation and flutter and the therapies available to treat them.

We encourage you to discuss your situation with your health care provider and consider formal evaluation of your heart rhythm disorder with one of our specialists.

RESOURCES AND CONTACT INFO

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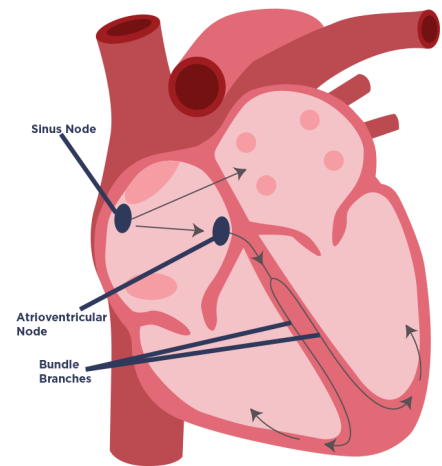
Atrial Fibrillation & Flutter Educator

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About Atrial Fibrillation & Flutter

THE NORMAL HEART RHYTHM

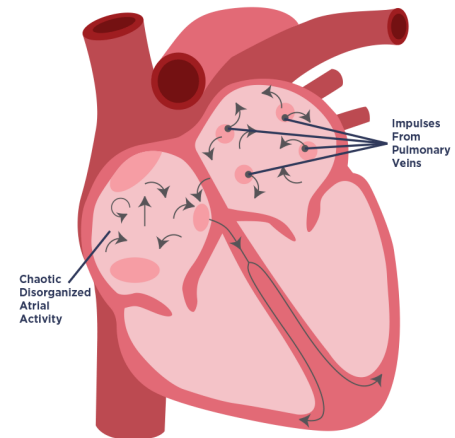
The heart is a muscle that pumps blood through the body. It has four chambers; two upper chambers, the atria, pump blood down to the lower two chambers, the ventricles. The ventricles pump blood to the rest of the body. The heart's electrical system controls the heart rate and rhythm. A normal heartbeat begins as an impulse generated in the sinus node, located in the right atrium. This electrical current spreads like a wave across the atria, telling them to contract. The wave of electricity is then funneled through the center of the heart at a region called the AV node, which serves as a connecting bridge between the atria and ventricles. Finally, the electricity travels down through the ventricles, which contract and eject blood from the heart. This normal heart rhythm is called "sinus rhythm."



Normal Sinus Rhythm

ATRIAL FIBRILLATION

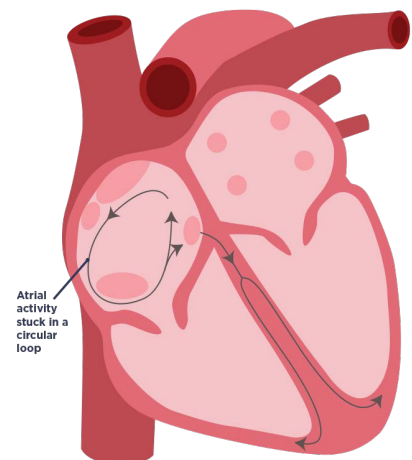
AFib is the most common heart rhythm disorder, affecting millions of Americans, particularly those over 65. In this disorder, the electrical activity in the atria is chaotic and disorganized, so the atria themselves quiver instead of contracting. The electrical signals reaching the ventricles are irregular, so the heart rate (pulse) is also irregular. The overall pumping function of the heart is reduced. Blood tends to pool in the atria and clots may form. These clots may travel to the brain and cause a stroke.



Atrial Fibrillation

ATRIAL FLUTTER

AFlutter is also a common heart rhythm abnormality that is similar to AFib. Patients with AFlutter can have all the same symptoms and problems that patients experience with AFib. However, in this disorder, the electricity in the upper chambers becomes stuck in a circular looping circuit that keeps spinning. The upper chambers do not contract effectively, so patients may have the same risk of blood clots and stroke as with AFib. With AFlutter, the electrical impulses reaching the ventricles may be fast, slow, or irregular, and some patients will have a regular rhythm.



Atrial Flutter

PATTERNS

AFib and Aflutter can be categorized into different patterns:

- **Paroxysmal** – terminates spontaneously or with intervention within 7 days
- **Persistent** – continuous and lasting longer than 7 days
- **Long standing persistent** – continuous and lasting longer than 12 months
- **Permanent** – condition accepted by the patient and physician, with no plans to either restore or maintain sinus rhythm

In general, when AFib and AFlutter are left untreated, patients may progress from short paroxysms of AFib or AFlutter to more persistent and possibly permanent AFib and AFlutter. Patients that have persistent or long standing persistent AFib may be harder to keep in sinus rhythm than those with paroxysmal AFib.

COMPLICATIONS

Stroke

Patients with AFib or AFlutter have, on average, a **five-times higher risk** of stroke than people without these problems.

A stroke occurs when part of the brain is injured due to damage to its blood supply. Depending on where the brain is injured, the affects can range from minor-to-severe. The most common type of stroke occurs when the blood flow is cut off due to disease in the small vessels of the brain, or from a blood clot that travels to the brain (ischemic or embolic stroke). Sometimes blood vessels in the brain may rupture causing bleeding into the brain which can also cause damage (hemorrhagic stroke).

Patients with AFib and AFlutter have higher risk of stroke due to sluggish blood flow and the tendency for blood to pool and form clots while the atria are not contracting normally. These blood clots may travel to the brain, obstructing blood flow and causing a stroke. The most common place for blood clots to form in the heart is the left

atrial appendage. Unfortunately, blood thinners used to limit the risk of blood clots and embolic strokes also slightly raise the risk of bleeding in the brain.

Possible signs of stroke:

- Sudden numbness or weakness of face, arm, or leg, especially if on one side only.
- Sudden confusion, trouble speaking or understanding.
- Sudden trouble seeing in one or both eyes.
- Sudden severe headache with no known cause.

If you or anyone with you show signs or symptoms of a stroke, **call 911 immediately**. Time is critical when trying to diagnose and treat strokes.

Heart Failure

Heart failure occurs when the heart muscle fails to pump adequate blood and nutrients to meet the demands of the body. AFib and AFlutter raise the risk of heart failure in several ways. When the atria are not effectively contracting, the overall pumping capacity of the heart is reduced. If the heart rate is too fast or slow, the heart is less efficient. Additionally, if the heart rate is too fast for long periods of time, the heart muscle can begin to wear out and weaken.

Syncope

Syncope is the sudden loss of consciousness (also known as passing out or fainting) due to transient loss of blood flow to the brain. AFib and AFlutter may increase the risk of syncope due to the highly varying heart rates.

Symptoms, Causes & Risk Factors

SYMPTOMS

Symptoms of AFib and AFlutter vary from patient to patient. Some patients feel no symptoms (asymptomatic) and remain unaware of the problem. Despite the lack of symptoms, these patients remain at risk of complications. Other patients have mild, moderate, or severe symptoms. Common symptoms include:

- **Palpitations**
- **Shortness of breath**
- **Chest discomfort**
- **Decreased energy**
- **Trouble with exercise or activities**
- **Feeling lightheaded or dizzy**
- **Fainting or passing out (syncope)**

CAUSES & RISK FACTORS

AFib and AFlutter can be caused by many other disorders. Sometimes a clear cause can be found. Many times the cause is less direct, and may be related to a combination of the risk factors associated with AFib and AFlutter. In some cases, the cause remains unknown. Common causes and risk factors include:

- Advanced age (Older than 60 years)
- Heart Failure
- Heart valve problems
- Coronary artery disease and prior heart attacks
- High blood pressure (hypertension)
- Other heart rhythm problems
- Prior heart surgery
- Lung disease
- Chronic obstructive pulmonary disease (COPD)
- Asthma
- Pneumonia
- Blood clots to the lung (pulmonary embolism)
- Thyroid disorders
- Obesity and obstructive sleep apnea
- Excessive caffeine, alcohol, or other stimulants
- Serious illness or infection
- Genetic predisposition (family history)



Diagnosis & Testing

The key to diagnosing AFib and AFlutter is catching the rhythm on an electrocardiogram or other heart rhythm monitor. The best tool to use depends on the symptoms and frequency of the rhythm disturbance.

TOOLS USED TO HELP DIAGNOSE AFIB OR AFLUTTER:

Electrocardiogram (ECG or EKG): Electrodes are placed on the body and attached to a machine to record a snapshot of the heart rhythm at that moment.

Wearable Monitors: Portable ECGs that can be worn for up to 30 days. These monitors can document intermittent cardiac events. Examples include Holter and event monitors.

Implantable Loop Recorders (ILRs): Small devices that can be placed under the skin in the chest area to allow continuous recording of the heart rate and rhythm for years at a time.

OTHER TESTS

Other tests may be recommended to better understand the cause of AFib or AFlutter and assess for associated problems.

These tests include:

Echocardiogram (echo): Ultrasound of the heart that produces images showing size and function of the heart muscle and valves. A transthoracic echo is done with the ultrasound probe simply touching the chest. A smaller probe can be inserted through the mouth and into the esophagus during transesophageal echo (TEES). TEES allow for better visualization of structures important to AFib and AFlutter including the left atrial appendage.

Blood Work/Lab Tests: Various tests are helpful in assessing causes of AFib or AFlutter and appropriate medication selection and dosing.

Chest X-ray: May help screen for lung and heart disease.

Cardiac Stress Test: Coronary Artery Disease (CAD) can cause AFib or AFlutter. CAD also influences treatment options.

Patients considered high risk for CAD, and those with symptoms suggestive of CAD, such as chest pain may be considered for a cardiac stress test or other screening tools.

Sleep Study or Home Nighttime Oximetry

Obstructive Sleep Apnea (OSA) may cause or make AFib and AFlutter more frequent. It is often recognized as severe snoring with pauses and gasps for air. Patients with obesity, thick necks, heavy snoring, and/or unexplained daytime sleepiness may be referred for a sleep study or home nighttime oximetry to look for episodes of decreased breathing or drops in oxygen levels while sleeping.



Treatment

GOALS

The goals of treatment for patients with AFib and AFlutter vary depending on several factors.

Some factors include:

- Severity of symptoms
- Duration of AFib or AFlutter
- Other health conditions

General Goals include:

- Treat or control causes and risk factors
- Reduce risk of complications such as stroke and heart failure
- Control heart rate
- Reduce symptoms
- Restore and maintain normal rhythm, particularly in patients with symptoms

LIFESTYLE & RISK FACTOR MODIFICATIONS

Patients may dramatically improve their overall health, reduce symptoms, and make controlling AFib and AFlutter easier by making healthy lifestyle changes and controlling other risk factors.

- Diet- Eat more fruits and vegetable. Reduce fat, especially saturated fats, to improve your cholesterol. Limit salt to help control blood pressure and fluid retention. Choose complex carbohydrates over simple sugars.
- Exercise- Regular exercise, even walking, may help. A diagnosis of AFib or AFlutter should not prevent you from exercising. Listen to your body. If you feel tired, are short of breath, light headed or have chest discomfort you should stop and rest.
- Weight loss- For overweight patients, losing weight through diet and exercise and/or bariatric surgery may reduce AFib and AFlutter burden.
- Stop smoking, eliminate tobacco products
- Limit alcohol, caffeine, and other stimulants
- Control blood pressure
- Treat sleep apnea if present



STROKE RISK REDUCTION

Managing stroke risk in AFib and AFlutter requires assessment of a patient's risk of stroke and bleeding. For most patients, the risk of stroke is high enough that the benefits of blood thinners outweigh the risks.

Patients with AFib or AFlutter who also have mechanical heart valves are at increased risk of stroke. A particular blood thinner, called Warfarin, is recommended for these patients.

For patients without significant valve disease, the risk of stroke is variable. It increases with age and the presence of other risk factors.

Assessing Risk of Stroke

Stroke risk in patients with AFib and Aflutter can be estimated by determining the patient’s CHADS-VASc score. Higher scores suggest higher risk of stroke.

CHADS-VASc Risk Criteria	Points
C- Congestive heart failure	1
H- High blood pressure (hypertension)	1
A- Age >75	2
D- Diabetes Mellitus	1
S ₂ - Prior Stroke or TIA	2
V- Vascular Disease	1
A- Age 65- 74	1
Sc- Sex category (i.e., female)	1

In 2014, the American Heart Association, American College of Cardiology, and Heart Rhythm Society provided these recommendations for stroke prevention in patients with non-valvular AFib or Aflutter based on CHADS-VASc score:

Score	Treatment
0	No blood thinner is reasonable
1	No blood thinner, aspirin, or anticoagulant may be considered
2 or >	Anticoagulants are recommended



Bleeding Risk

Bleeding risk is also variable. Factors that increase a patient’s risk for bleeding include:

- Prior bleeding
- Advanced age
- Concurrent use of other blood thinners
- Significant kidney or liver disease
- Uncontrolled hypertension

The decision to start a blood thinner is complex and is best made after thorough consideration of risks and benefits of all options with your health care provider.

Blood Thinners

Blood clots may form when platelets bind to each other, and are reinforced through the work of clotting factors. Two types of blood thinners used in AFib and Aflutter are antiplatelets and anticoagulants.

Antiplatelets (e.g. aspirin or clopidogrel), work by inhibiting platelets. They may lower the risk of stroke slightly but are not as effective as anticoagulants and may be inadequate for patients at high risk of stroke.

Anticoagulants inhibit the clotting factors and clearly lower the risk of stroke in AFib and Aflutter patients.

- **Vitamin K Antagonists** (e.g. Warfarin) has been used for decades and most doctors are familiar with it. It can be reversed quickly in an emergency. However, the dosage must be tightly regulated to remain safe and effective.
- **Novel Oral Anticoagulants** are new alternatives that are now available and include:
 - **Direct thrombin inhibitors**
dabigatran (Pradaxa)
 - **Factor Xa inhibitors**
apixaban (Eliquis)
edoxaban (Savaysa)
rivaroxaban (Xarelto)



These novel oral anticoagulants have different mechanisms than warfarin and have advantages and disadvantages. The benefits of novel agents include fewer drug-drug interactions, reduced food-drug or dietary effects, lower risk of intracranial bleeding, and less frequent monitoring.

Unfortunately, they may be more expensive, do not all have antidotes, and have some exclusions and/or dosing adjustments necessary due to other health problems. They are not recommended in patients with mechanical heart valves.

Choosing an appropriate blood thinner can be a complex decision and is best made after thorough consideration of risks and benefits of all options with your health care provider.

DEVICES AND PROCEDURES USED TO REDUCE STROKE RISK

Most strokes in patients with AFib or AFlutter result from blood clots that form in a small pouch connected to the left atrium, called the left atrial appendage. The clots may break off and travel to the brain and block blood flow, causing a stroke.

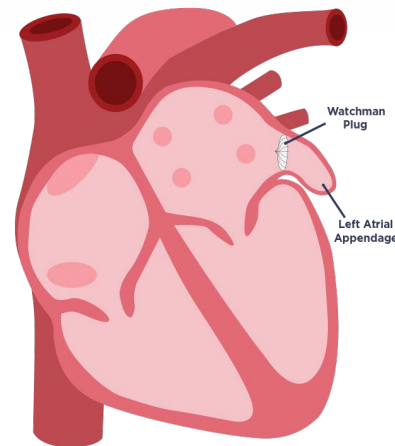
Blood thinners limit the risk of stroke by thinning the blood in the entire body. This lowers the risk of stroke, but raises the risk of bleeding.

Patients who are at high risk for strokes and cannot tolerate blood thinners or are unable to take long term oral anticoagulants, may be eligible to have a procedure to occlude,

exclude, or remove the left atrial appendage. These procedures may help lower the risk of stroke without long term blood thinners. These techniques are reserved as second options for patients who cannot tolerate or take blood thinners. Procedures may include:

The Watchman

The WATCHMAN is a plug that seals the left atrial appendage from the inside. It is implanted from a catheter inserted in the vein in the leg. It does not require heart surgery.



Watchman

Surgical Clip or Excision

Surgeons may surgically remove, clip, or sew closed the left atrial appendage during heart surgery or during a stand-alone procedure using smaller incisions in the chest.

RATE VS RHYTHM CONTROL

Rate Control Strategy

An important goal in managing AFib and AFlutter in all patients is ensuring that the pulse, or heart rate, remains in a relatively normal range regardless of the underlying rhythm. With a rate control strategy, the patient is allowed to remain in AFib or AFlutter, but medications or procedures are used to maintain a normal heart rate.

Rate-controlling medications: Medications that block or slow conduction through the AV node limit the number of impulses from the atria reaching the ventricles slowing the heart rate and helping keep it in the normal range. Common rate controlling medications include:

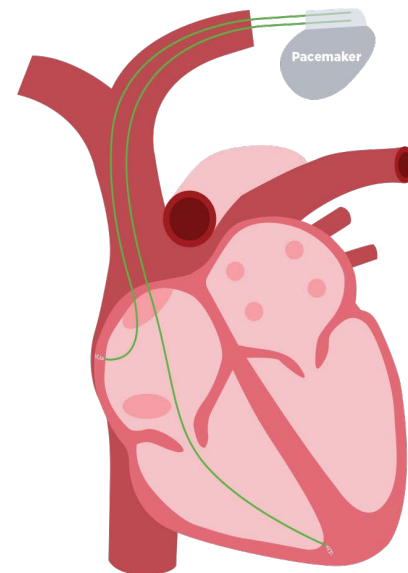
- Beta blockers (e.g. metoprolol)
- Calcium channel blockers (e.g. diltiazem or verapamil)
- Digoxin

Rate-controlling procedures: When attempts to control the heart rate with medications alone fail, procedures can help.

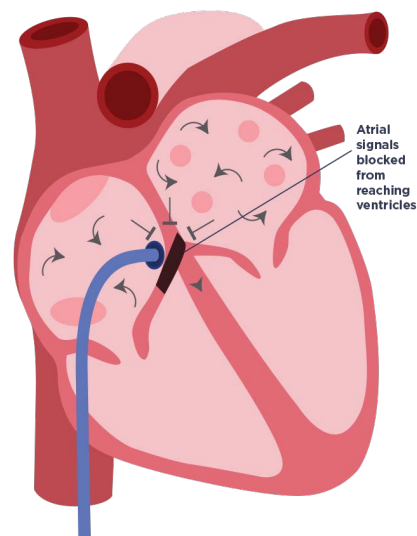
- **Pacemaker:** A pacemaker is a small implanted device that monitors heart rate and sends a small electrical signal to the heart triggering it to beat if it slows down. Pacemakers prevent slow heart rates but cannot stop AFib or AFlutter or prevent fast heart rates alone.
- **AV node ablation:** An AV node ablation is a minor procedure during which an electrophysiologist destroys the electrical connection between the atria and the ventricles at the AV node. This is done with a catheter that is inserted from a vein in the leg. After this procedure, the ventricles will not receive any impulses or commands to squeeze from the atria, so a pacemaker is required prior to the procedure.

Rhythm Control Strategy

Patients that have symptoms or complications from their AFib or AFlutter may benefit from attempts to restore and maintain normal rhythm. Rhythm control is generally not recommended or needed unless patients are symptomatic or have complications from AFib or AFlutter. Restoring and maintaining normal rhythm can be attempted using medications, cardioversions, and/or ablations.



Pacemaker



AV node ablation

Rhythm-controlling medications

(Antiarrhythmic medications)

Several medications are available to help restore and reduce recurrences of AFib or AFlutter. They work by changing the electrical properties of the atria and try to limit the electrical irritability causing AFib and AFlutter.

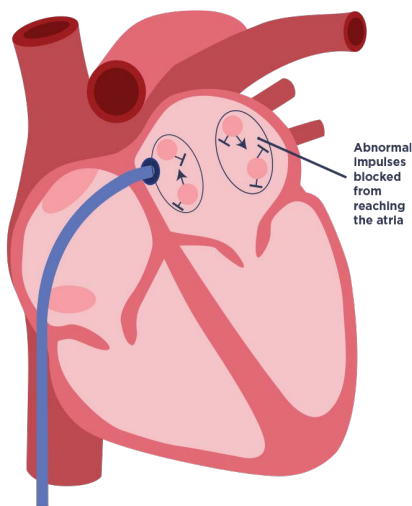
Medications help limit the frequency of episodes, but most patients will continue to have intermittent AFib or AFlutter. Also, all medications have some risk of side effects.

Cardioversions: A cardioversion is a procedure in which an electrical shock is delivered via pads on the chest that resets the heart rhythm, stopping AFib and AFlutter and giving normal rhythm a chance to return. Medication is provided so that patients are generally unaware of the shock. Cardioversions are usually successful at restoring normal rhythm but do nothing to prevent future recurrences of AFib or AFlutter.

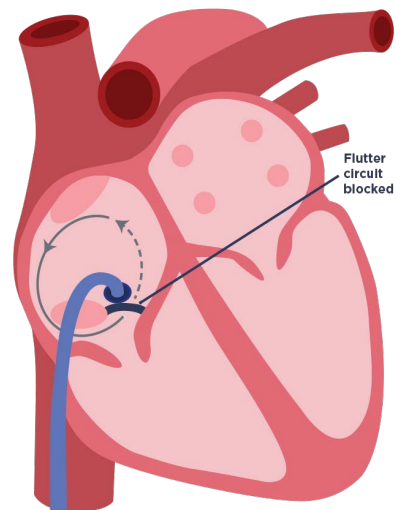
Catheter ablation of AFib or AFlutter: An ablation is a procedure designed to restore and maintain normal rhythm by destroying the heart tissue responsible for the abnormal rhythm. This can be done by eliminating the irritable tissue

that is causing or triggering the abnormal rhythm, or by creating electrical barriers that prevent the abnormal electrical impulses from reaching the rest of the heart or spinning around the heart.

Catheter ablation is a non-surgical procedure performed in a cardiac electrophysiology lab by a cardiac electrophysiologist along with a team of highly skilled nurses and technicians. Depending on patient and physician preference, patients are given either conscious/moderate sedation to keep them relaxed and comfortable but still awake, or general anesthesia to keep them completely asleep and unconscious. Catheters are inserted from the veins in the legs into the heart. These catheters are then used to map the electrical circuits and impulses in the heart and then ablate or destroy the abnormal tissue. This can be done by burning or freezing the tissue. The procedure can take between 1-4 hours depending on the complexity and location of the rhythm problem.



AFib Catheter Ablation



AFlutter Catheter Ablation

Benefits of catheter ablation:

- Better control of the rhythm with reduced risk of recurrent AFib or AFlutter
- Reduced symptoms of AFib or AFlutter
- Improved quality of life

Risks of catheter ablation:

- AFib or AFlutter may recur even after ablation.

As with all invasive procedures, catheter ablation involves risks that must be considered, some of which can be severe.

Surgical Ablation of AFib or AFlutter: Heart surgeons have developed strategies for ablating AFib and AFlutter with surgical techniques. These approaches are generally more invasive than catheter ablations, but may be preferred in certain situations. Surgical ablations can be categorized into two types based on whether or not the ablation occurs as part of an already planned surgery or as the primary operation.

Concomitant Ablation: When a patient with AFib or AFlutter undergoes surgery for another necessary heart condition, such as valve replacement or repair, the surgeon can perform a surgical ablation at the same time. This is concomitant ablation. The surgeon cuts, burns, or freezes the tissue directly, rather than using catheters to reach the heart.

Stand-alone ablation: Stand-alone surgical ablation is when surgical ablation is done for treatment of AFib or AFlutter alone, and not part of another operation. Newer techniques allow the surgeon to reach the heart through smaller incisions or ports with ablation devices instead of opening the chest. Because stand-alone ablation is more invasive than catheter-based ablation, it is usually reserved for patients that have either failed catheter-based ablation or have had long standing persistent AFib and prefer a surgical approach.

Hybrid surgical-catheter ablation: Hybrid surgical-catheter ablation is a technique involving both a cardiothoracic surgeon and an electrophysiologist. Usually, a surgeon first performs a surgical ablation. Then the electrophysiologist performs an electrophysiology study with additional ablation either later that day or as a staged procedure at a later date. This technique leverages some of the advantages of both techniques but may increase risk due to the need for two procedures.

QUESTIONS FOR YOUR DOCTOR

- Do I have AFib, AFlutter, or both?
- Do I have potentially reversible or modifiable causes of my AFib/AFlutter that we should work to control?
- What is my stroke risk, which is estimated by the CHADS-VASc score?
- Do I need a blood thinner? And if so, which is best for me? What follow-up is necessary to monitor my blood thinner?
- Are we accepting that I will remain in AFib or AFlutter, and focusing primarily on heart rate control, or are we trying to restore and maintain normal rhythm? What medications or procedures will be used to achieve that goal?
- Who will follow and guide my AFib and/or AFlutter care? Who is my primary care doctor and cardiologist? Is there any reason to consult a cardiac electrophysiologist or cardiothoracic surgeon?

Conclusion

ARRHYTHMIA ASSOCIATES OF SOUTH TEXAS IS HERE TO HELP

We can work with your primary care doctor and cardiologist to define an individually tailored treatment plan based on key factors such as your severity of symptoms, age, other health conditions, and personal preferences.

Please discuss your situation with your primary care doctor and cardiologist.

If you have additional questions, or would like more information about treatment options, please call Arrhythmia Associates of South Texas at **210-590-7712**

Thank you for choosing Arrhythmia Associates of South Texas.

2012 - Began using **Stereotaxis**, a robotic magnetic catheter ablation system for treatment of AFib and AFlutter.

2014 - Began performing AFib ablation using an alternative, retroaortic approach in patients unable to undergo traditional ablation procedures.

2015 - Began performing fluoroless ablation to ablate AFib and AFlutter with real-time ultrasound guidance and advanced 3D mapping instead of x-ray fluoroscopy. Thus, no radiation exposure for patients.

2017 - Collaborated with Northeast Baptist Hospital to open a dedicated electrophysiology unit (EP Unit)

Helped the Baptist Health System achieve **Afib Gold level** recognition – 1st in San Antonio to achieve Gold level recognition from the American Heart Association for meeting specified metrics for quality in AFib.

Sources:

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