PATIENT INFORMATION
GUIDE TO
ATRIAL FIBRILLATION

• Atrial Fibrillation (AF)
• Atrial Flutter (AFL)
• Rate and Rhythm Control
• Stroke Prevention

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www.stroke.org

Content Contributor

MASSACHUSETTS GENERAL HOSPITAL
HEART CENTER

AF 360°

A Comprehensive Resource from the Heart Rhythm Society
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ATRIAL FIBRILLATION OVERVIEW

An arrhythmia is an abnormal heart rhythm. The four chambers of the heart usually beat in a steady, rhythmic pattern. Atrial fibrillation (AF) occurs when the atria (the upper chambers of the heart) are fibrillating, or “quivering,” resulting in a rapid, irregular heart rhythm.

The normal heart rate for an adult is between 60 and 100 beats every minute. When the heart is in AF, the atria can beat over 300 times every minute.

Atrial fibrillation itself is not dangerous; however, if left untreated, the side effects of AF can be potentially life-threatening. When the atria are “fibrillating,” the flow of blood to the ventricles is slowed which increases the risk of developing a blood clot. If a blood clot were to break loose, it could result in a stroke or a heart attack. Without treatment, AF can also cause the ventricles (the lower chambers of the heart) to beat too fast. This can weaken the heart muscle over time and lead to heart failure.

AF is the most common type of arrhythmia. There are approximately 2.3 million people in the United States who have AF, with 160,000 new cases diagnosed every year. Eight out of every 100 people over the age of 65 are diagnosed with AF. Although it usually occurs in adults older than 60, younger adults can develop AF too.
WHAT IS ATRIAL FIBRILLATION (AF)?

The electrical system of the heart is the power source that makes the heart beat. Electrical impulses travel along a pathway in the heart and make the atria and the ventricles work together to pump blood through the heart.

A normal heartbeat begins as a single electrical impulse that comes from the sino-atrial (SA) node, a small bundle of tissue located in the right atrium. The impulse sends out an electrical pulse that causes both atria to contract (squeeze) and move blood into the lower ventricles. The electrical current then passes through a small bundle of tissue called the atrio-ventricular (AV) node (the electrical bridge between the upper and lower chambers of the heart), causing the ventricles to squeeze and release in a steady, rhythmic sequence. As the chambers squeeze and release, they draw blood into the heart and push it back out to the rest of the body. This is what causes the pulse we feel on our wrist or neck.

AF occurs when the atria begin to fibrillate, or “quiver,” rapidly. Instead of one impulse moving through the heart, many impulses begin in the atria and fight to get through the AV node. There are several factors that allow this abnormal electrical rhythm to occur and continue. Age related changes, certain medical conditions such as poorly treated hypertension, coronary artery or valvular heart disease can change the electrical properties within the heart, making it more likely for AF to occur. As the electrical pathway
changes, one or more “triggers” may develop. “Triggers” are electrical circuits that send extra impulses at a faster than usual rate. These extra impulses force the atria to fibrillate, or “quiver,” in a fast and disorganized way.

The Society also offers a variety of diagrams and medical animations related to atrial fibrillation on www.HRSonline.org/patientinfo.
THREE TYPES OF ATRIAL FIBRILLATION

Paroxysmal – Paroxysmal refers to AF that comes and goes on its own. The AF may last for seconds, minutes, hours or days before the heart returns to its normal rhythm. People with this type of AF usually have more symptoms than others. As the heart goes in and out of AF, the pulse rate may change from slow to fast and back again in short periods of time.

Persistent – Persistent is when the AF does not stop by itself. Medications or a special type of electrical shock (called a cardioversion) is used to help the heart return to normal rhythm. If no treatment is given, the heart will stay out of rhythm.

Permanent – Permanent is when the AF cannot be fixed. Medications and controlled electrical shock cannot help return the heart to normal rhythm.

RISK FACTORS FOR ATRIAL FIBRILLATION

Some people who are living healthy lives and have no other medical problems do develop AF. In most cases though, we do know the cause. The most common causes and risk factors include:

• Older than 60 years of age
• Diabetes
• Heart problems:
  - High blood pressure
  - Coronary artery disease
  - Prior heart attacks
  - Congestive heart failure
  - Structural heart disease (valve problems or congenital defects)
  - Prior open heart surgery
  - Untreated atrial flutter (another type of abnormal heart rhythm)
• Thyroid disease
• Chronic lung disease
• Sleep apnea
• Excessive alcohol or stimulant use
• Serious illness or infection
SYMPTOMS OF ATRIAL FIBRILLATION

The symptoms of AF are different for each person. Many people feel no symptoms at all. They do not even know they have AF or that there is a problem, while others can tell as soon as it begins. This is because the symptoms depend on age, the cause of the AF (heart problems, other diseases, etc.) and on how much AF affects the pumping of the heart. The symptoms of AF include:

- Feeling over-tired or a lack of energy (most common)
- Pulse that is faster than normal or changing between fast and slow
- Shortness of breath
- Heart palpitations (feeling like your heart is racing, pounding or fluttering)
- Trouble with everyday exercises or activities
- Pain, pressure, tightness or discomfort in your chest
- Dizziness, lightheadedness or fainting
- Increased urination (using the bathroom more often)

COMPLICATIONS FROM ATRIAL FIBRILLATION

AF is usually not life threatening. However, when the atria are “fibrillating,” the flow of blood to the ventricles is slowed, which increases the risk of developing a blood clot. If the clot is pumped out of the heart, it could travel to the brain and lead to a stroke. This is the cause of about 15 out of every 100 strokes. The risk of stroke from AF increases with age and is closely linked to the presence of other risk factors such as heart disease, high blood pressure and an enlarged heart.

A blood clot can interrupt blood flow to the brain and cause a stroke.
In addition, AF can also cause a fast pulse rate for long periods of time. This means that the ventricles are beating too fast. When the ventricles beat too fast for long periods of time, the heart muscle can become weak. This condition is called cardiomyopathy. This can lead to heart failure and long-term disability.

To help prevent these complications, treatment for AF usually includes one medication to reduce the chance of blood clots and stroke, and another to keep the pulse from going too fast.

**HOW IS ATRIAL FIBRILLATION DIAGNOSED?**

There are several tests that can be done to check for a fast or irregular heartbeat. Your doctor may order these tests if you are having signs or symptoms of a heart problem. The symptoms include heart palpitations (feeling like your heart is racing, pounding or fluttering), shortness of breath or dizziness.

**Electrocardiogram (ECG)** – An ECG is a snapshot of your heart’s electrical activity. Stickers (electrodes) are attached to your chest, arms and legs. These electrodes measure the rate and rhythm of your heart. An ECG is commonly used to diagnose AF.
Holter monitor – A Holter monitor is a portable ECG. It is typically worn for 24 hours, but can be worn for several days. Stickers (electrodes) are placed on your chest and are then connected to a small recording machine that is usually worn around the waist. It digitally records the electrical activity of your heart for your doctor to review later.

Mobile cardiac monitoring –
A mobile cardiac monitor is worn for up to 30 days. It monitors your heart beat when it is normal and will trigger a recording when it senses an abnormal rhythm. The results are automatically sent to your physician. Your physician uses this information to evaluate your symptoms and determine what is causing the arrhythmia. This type of monitor is helpful to diagnose AF in asymptomatic patients.

Event monitor – An event monitor is a portable ECG that is used for patients who have an irregular heart rhythm every once in a while. You will carry the monitor with you at all times and attach it to your chest when you feel symptoms. This lets your doctor check your heart rhythm at the time of your symptoms.

Echocardiogram – An echocardiogram uses sound waves to produce images of your heart. This test allows your doctor to see how your heart muscle is moving and pumping blood. You may have one of several types of echocardiograms.
• Transthoracic echocardiogram (TTE) – This is a standard, non-invasive (no incisions or cuts) echocardiogram that gives your doctor a picture of your beating heart. A technician spreads a special gel on your chest and then uses an imaging device, called a transducer, that records the sound waves bouncing off the walls and valves in your heart. A computer then creates a video image of your heart. This video can show the size of your heart, how well your heart is working, if the heart valves are working and if there are blood clots in your heart.

• Transesophageal echocardiogram (TEE) – A transesophageal echocardiogram, or a TEE, is often done when the doctor needs to get a good picture of the back of your heart. To get a clear picture, a probe called a transducer is placed down your esophagus (the tube that connects your mouth to your stomach). The esophagus passes right behind the heart. Having the probe positioned in the esophagus allows for better visualization of the atria. This procedure can be uncomfortable; therefore, a small amount of sedation can be given through an intravenous (IV) line to make you sleepy. A topical anesthetic spray is used to numb the back of the throat to enable the probe to be passed with minimal discomfort. Once the probe is in place, it works the same way as described above (TTE).
Cardiac computerized tomography (CT) or magnetic resonance imaging (MRI) – Cardiac computed tomography, or cardiac CT, uses an X-ray machine and a computer to take clear, detailed pictures of the heart. During a cardiac CT scan you will lie on a table. An X-ray machine will move around your body. The machine will take pictures of your heart and chest. A computer will put the pictures together to make a three-dimensional (3D) picture of your heart and chest.

A cardiac MRI uses radio waves, magnets and a computer to create pictures of your heart. During a cardiac MRI you will lie on a table inside a long tube-like machine. Cardiac MRI creates detailed pictures of your heart as it is beating. The MRI will create snapshots as well as videos. Doctors use cardiac MRI to see the beating heart, the parts of the heart and how the heart is working.
TREATMENT OPTIONS

There are several treatment options for atrial fibrillation. Your doctor will decide on a treatment based on several factors. These factors include your symptoms, the type of AF and the cause of your AF. The goals of treatment for atrial fibrillation include:

• Prevent blood clots from forming
• Control the heart rate
• Return the heartbeat to a normal rhythm, if possible
• Treat the cause(s) of the abnormal rhythm and any AF complications
• Reduce the risk factors that may lead to the AF getting worse

MEDICATION

If you have atrial fibrillation, you may need to take one or more medicines for the rest of your life, such as:

• Rhythm control medications (anti-arrhythmic drugs) – medications that help keep a normal heart rhythm
• Rate control medications – medications that slow down a fast heart rate and prevent weakening of the heart muscle
• Blood thinners – medications that help prevent blood clots and reduce the risk of stroke

Everyone reacts differently to medication. You may need to try more than one medicine before you find what works best for you and has the fewest side effects.

CARDIOVERSION

Even though you are taking medication, you may still go into AF from time to time. Your doctor may offer cardioversion as one treatment option. Cardioversion is a procedure in which an electrical current, or shock, is given to the heart muscle to restore the normal rhythm. It sounds scary, but it is a simple, same-day procedure. You will be given a small amount of sedation through an IV line. Large pads (electrodes) will be placed on your chest. The electrical current will pass through these electrodes to return your heart rhythm to normal.
CATHETER ABLATION

Catheter ablation is a non-surgical procedure that can be used when medication is not working to control the heart rhythm. Catheter ablation is done in an electrophysiology lab in the hospital by a team of highly skilled nurses and technicians who work alongside the electrophysiologist (doctor who specializes in treating heart rhythm conditions). The goal of the procedure is to reduce the frequency and duration of AF episodes.

In this procedure thin, flexible wires called catheters are inserted into a vein in your groin and/or neck. These wires are threaded up through the vein and into the heart using X-rays to guide the way. There are electrodes at the tip of the wires. The electrodes are able to detect electrical signals from different parts of the heart. The doctor will be able to tell where the bad electrical signals are coming from. A special catheter called an ablation catheter sends out radio waves that create heat. This heat destroys the tissue (cauterizes) in the heart and blocks the abnormal electrical signals, which can trigger AF. Special equipment creates a 3D picture of your heart. This helps the doctor know exactly where to apply the heat. Another option is to use freezing cold to destroy the heart tissue. The basic process would be the same.
You will be given sedation through an IV line to keep you comfortable during the procedure (known as conscious sedation). Conscious sedation means that you are still awake, but are very sleepy. You will have enough medication that you will not be aware of what is happening or feel any pain. In some situations, general anesthesia may be used. The type of sedation will depend upon your doctor, the hospital and your overall health. During the ablation, you will be given a blood thinner to prevent clots from forming in your heart during the procedure.

Catheter ablation is a procedure that is used to correct rapid heartbeats by destroying cardiac tissue that creates abnormal electrical signals. A catheter with an ablation tip is entered into the heart to the site of the tissue producing the abnormal signal.
Catheter ablation usually takes between two and six hours. Your medical team will closely monitor your heart beat, blood pressure and breathing during this time. After the procedure, pressure will be placed on the area where the catheters were inserted to prevent bleeding. You may need to stay in the hospital for one or two days, which will depend upon your doctor and the medical center. Your doctor will tell you how to take care of yourself when you leave the hospital.

Atrial fibrillation ablation is a safe procedure, but there are some risks. Fewer than five out of every 100 people who have the procedure develop one of these related problems. Some of these risks include stroke, pericardial tamponade (collection of blood around the heart), damage to the blood vessels in your groin area, pulmonary vein stenosis (narrowing of the veins coming from the left atrium to the lungs) and a serious but extremely rare risk of atrioesophageal fistula (an opening that forms between the atria and the esophagus).

After the procedure you should watch for bleeding or oozing from the catheter sites, discomfort at the catheter sites, aches or discomfort in your chest, fatigue or lightheadedness. Contact your doctor if you have any questions or concerns about any symptoms.
Surgical ablation is an approach that some physicians use to destroy the cells causing abnormal heart rhythms. Usually this treatment is used for AF patients who are not helped by medication or catheter ablation. Surgical ablation may also be used if there is another heart condition that requires surgery, at which time physicians will try to treat both issues at once.

Surgical ablation is a treatment that requires a more invasive approach then a catheter ablation procedure. During the surgical ablation, a surgeon burns the surface of the heart directly rather then relying on catheters and X-rays to reach the heart. New techniques have allowed surgeons to use smaller incisions to perform surgical ablations and other open heart surgeries.

There are many risks associated with surgical ablation. Some of these risks include atrioesophageal fistula (an opening that forms between the atria and the esophagus), injuries to the coronary artery (possible heart attack) and phrenic nerve paralysis (severe damage to your diaphragm). As with any surgery, complications and risks vary for each patient, so you should discuss all risks with your surgeon.

WHAT TO ASK YOUR DOCTOR

If you have been diagnosed with atrial fibrillation, or suspect that you may have the condition, here are some questions that you may want to ask your physician:

- What is the cause of my AF?
- How can I be sure I have AF and not a more serious heart rhythm problem?
- Will my condition go away on its own?
- What are the risks that it will become worse (more symptomatic)?
- Am I at increased risk of having a stroke?
- What are my treatment options?
- What are the risks and side effects of medications to control my condition, or to reduce the risk of stroke?
- What are the risks and benefits of other treatment options?
- Should I see an electrophysiologist (a specialist in heart rhythm disorders)?
ATRIAL FLUTTER

An arrhythmia is an abnormal heart rhythm. Atrial flutter (AFL) is the second most common type. In AFL, the atria (the upper chambers of the heart) beat too fast. The four chambers of the heart usually beat in a steady, rhythmic pattern. With AFL, the atria are beating faster than the ventricles (the lower chambers).

AFL itself is not life-threatening. If left untreated, the side effects of AFL can be potentially life-threatening. AFL makes it harder for the heart to pump blood effectively. With the blood moving more slowly, it is more likely to form clots. If the clot is pumped out of the heart, it could travel to the brain and lead to a stroke or heart attack. Without treatment, AFL can also cause a fast pulse rate for long periods of time. This can weaken the heart muscle over time, and potentially lead to heart failure. Without treatment, AFL can also cause another type of arrhythmia called atrial fibrillation. Atrial fibrillation (AF) is the most common type of abnormal heart rhythm.
WHAT IS ATRIAL FLUTTER (AFL)?

The electrical system of the heart is the power source that makes the heart beat. Electrical impulses travel along a pathway in the heart and make the atria and the ventricles work together to pump blood through the heart.

A normal heartbeat begins as a single electrical impulse that comes from the sino-atrial (SA) node, a small bundle of tissue located in the right atrium. The impulse sends out an electrical pulse that causes both atria to contract (squeeze) and move blood into the lower ventricles. The electrical current passes through a small bundle of tissue called the atrio-ventricular (AV) node (the electrical bridge between the upper and lower chambers of the heart), causing the ventricles to squeeze and release in a steady, rhythmic sequence. As the chambers squeeze and release, they draw blood into the heart and push it back out to the rest of the body. This is what causes the pulse we feel on our wrist or neck.

With AFL, the electrical signal travels along a pathway within the right atrium. It moves in an organized circular motion, or “circuit,” causing the atria to beat faster than the ventricles of your heart.
AFL is a heart rhythm disorder that is similar to the more common AF. In AF, the heart beats fast and in no regular pattern or rhythm. With AFL, the heart beats fast, but in a regular pattern. The fast, but regular pattern of AFL is what makes it special. AFL makes a very distinct “sawtooth” pattern on an electrocardiogram (ECG), a test used to diagnose abnormal heart rhythms.

Flow of electrical signals in a normal heartbeat.

Atrial flutter moving in an organized circular motion, or “circuit,” within the right atrium.
**RISK FACTORS FOR ATRIAL FLUTTER**

AFL affects 88 out of 10,000 new patients each year, making it the second most commonly diagnosed arrhythmia after AF. Some medical conditions increase the risk of developing atrial flutter. These medical conditions include:

- Heart disease:
  - Congestive heart failure
  - Coronary artery disease (including a history of heart attack)
  - Structural heart disease (such as valve abnormalities or congenital defects)
  - High blood pressure (hypertension)
- Recent surgery (especially heart surgery)
- Thyroid dysfunction
- Alcoholism (especially binge drinking)
- Chronic lung disease
- Acute (serious) illness
- Diabetes

**SYMPTOMS OF ATRIAL FLUTTER**

The electrical signal that causes AFL circulates in an organized, predictable pattern. This means that people with AFL usually continue to have a steady heartbeat, even though it is faster than normal. It is possible that people with AFL may feel no symptoms at all. Others do have symptoms, which may include:

- Heart palpitations (feeling like your heart is racing, pounding or fluttering)
- Fast, steady pulse
- Shortness of breath
- Trouble with everyday exercises or activities
- Pain, pressure, tightness or discomfort in your chest
- Dizziness, lightheadedness or fainting
**COMPLICATIONS FROM ATRIAL FLUTTER**

AFL is usually not life threatening. However, AFL makes the atria beat much faster than normal. This makes it harder for the heart to pump blood. With the blood moving more slowly, it is more likely to form clots. If the clot is pumped out of the heart, it could travel to the brain and lead to a stroke. The risk of stroke increases with age and is closely linked to the presence of other risk factors such as heart disease, high blood pressure or an enlarged heart.

In addition, AFL can cause a fast pulse rate for long periods of time. When the heart beats too fast for long periods of time, the heart muscle can become weak. This condition is called cardiomyopathy. This can lead to heart failure and long-term disability.
HOW IS ATRIAL FLUTTER DIAGNOSED?

There are several tests that can be done to check for a fast or irregular heartbeat. Your doctor may order these tests if you are having signs or symptoms of a heart problem. The symptoms include heart palpitations (feeling like your heart is racing, pounding or fluttering), shortness of breath or dizziness.

Electrocardiogram (ECG) – An ECG is a snapshot of your heart’s electrical activity. Stickers (electrodes) are attached to your chest, arms and legs. These electrodes measure the rate and rhythm of your heart. AFL shows a very distinct “sawtooth” pattern on the ECG.

See pages 6 -8 for descriptions of these diagnostic tests.
TREATMENT OPTIONS
There are several treatment options for atrial flutter. Your doctor will decide on a treatment based on several factors including your age, your symptoms and the cause of your AFL. The goals of treatment for atrial flutter include:

- Prevent blood clots from forming
- Control the heart rate
- Return the heartbeat to a normal rhythm, if possible
- Treat the cause(s) of the abnormal rhythm and any AFL complications
- Reduce the risk factors that may lead to the AFL

MEDICATION
If you have atrial flutter, you may need to take one or more medicines for the rest of your life, such as:

- **Rhythm control medications (anti-arrhythmic drugs)** – medications that help keep a normal heart rhythm by controlling the electrical signals that pass to the lower chambers of the heart
- **Rate control medications** – medications that slow down a fast heart rate and prevent weakening of the heart muscle by controlling the electrical signals that occur in the upper chambers of the heart
- **Blood thinners** – medications that help prevent blood clots and reduce the risk of stroke

Everyone reacts differently to medication. You may need to try more than one medicine before you find what works best for you and has the fewest side effects.
CATHETER ABLATION

Catheter ablation is done in an electrophysiology lab in the hospital by a team of highly skilled nurses and technicians who work alongside the electrophysiologist, a doctor who specializes in treating heart rhythm conditions.

In this procedure thin, flexible wires called catheters are inserted into a vein in your groin and/or neck. These wires are threaded up through the vein and into the heart using X-rays to guide the way. There are electrodes at the tip of the wires. The electrodes are able to detect electrical signals from different parts of the heart. A special catheter called an ablation catheter sends out radio waves that create heat. This heat destroys the tissue (cauterizes) in the heart and blocks the abnormal electrical signals or “circuit.” Special equipment creates a three-dimensional (3D) picture of your heart. This helps the doctor see exactly where to apply the heat. In the case of atrial flutter, the ablation catheter is positioned at a particular ridge of tissue called the cavotricuspid isthmus. This ridge is located on the right side of the heart between the top chamber and the bottom chamber.

You will be given sedation through an intravenous (IV) line to keep you comfortable during the procedure (known as conscious sedation). Conscious sedation means that you are still awake. You will have enough medication that you will not be aware of what is happening or feel any pain. In some situations, general anesthesia may be used. The type of sedation will depend upon your doctor, the hospital and your overall health. During the ablation, you may be given a blood thinner to prevent clots from forming in your heart during the procedure.

Catheter ablation usually takes between two and six hours. Your medical team will closely monitor your heart beat, blood pressure and breathing during this time. After the procedure, pressure will be placed on the area where the catheters were inserted to prevent bleeding. You may need to stay in the hospital for one or two days. The amount of time you will stay in the hospital will depend upon your doctor and the medical center. Your doctor will tell you how to take care of yourself when you leave the hospital.
In general, atrial flutter ablation is a very successful procedure with a low complication rate. Of course, you should watch for bleeding or oozing from the catheter sites, discomfort at the catheter sites, aches or discomfort in your chest, fatigue or lightheadedness. Contact your doctor if you have any questions or concerns about any symptoms.
WHAT TO ASK YOUR DOCTOR

If you have been diagnosed with atrial flutter, or suspect that you may have the condition, here are some questions that you may want to ask your physician:

• What is the cause of my AFL?
• How can I be sure I have AFL and not a more serious heart rhythm problem?
• Will my condition resolve on its own?
• What are the risks that it will become worse (more symptomatic)?
• Am I at increased risk of having a stroke?
• What are my treatment options?
• What are the risks and side effects of medications to control my condition, or to reduce the risk of stroke?
• What are the risks and benefits of other treatment options?
• Should I see an electrophysiologist (a specialist in heart rhythm disorders)?
RATE AND RHYTHM CONTROL

When the heart is in atrial fibrillation (AF), it beats in an irregular pattern and can beat fast. There are two ways to try to control or manage AF. One method, rate control, is used to manage the fast beat of your heart in AF. Your physician will try to slow down the heart rate into a normal range. Another method, rhythm control, is used to manage the irregular pattern of your heartbeat in AF. Your physician will try to treat the AF and return the heart to its normal rhythm.

When the ventricles beat too fast for long periods of time, the heart muscle can become weak. This condition is called a cardiomyopathy. This can cause symptoms of congestive heart failure, including swelling in your legs and feet, trouble breathing and shortness of breath while doing everyday exercises or activities. If this continues, heart failure can become chronic; however it may be reversible if treated early enough.

AF is usually not life threatening. However, AF makes the atria contract much faster than normal and in a disorganized way. This makes it harder for the atria to pump blood to the ventricles. With the blood moving more slowly, it is more likely to form clots. If the clot is pumped out of the heart, it could travel to the brain and lead to a stroke. This is the cause of about 15 out of every 100 strokes.

RHYTHM CONTROL

Rhythm control is one method your physician may use to try to treat the AF and return the heart to its normal rhythm. In order to manage your heart rate, your physician will use medications or an ablation procedure. There are several benefits to rhythm control. These benefits include:

- A more normal heart rate
- Atria and ventricles working well together
- Proper flow of blood from the atria to the ventricles
- Less discomfort from an irregular heartbeat
**Medications** – There are several types of rhythm controlling drugs. Each type works in a different way to reduce AF by decreasing or eliminating the irregular activity in the upper chamber of your heart. Since each patient is different, you and your doctor will decide which medication is the best treatment option for you.

You will most likely need to try several medications to find one that works for you. Once you find a drug that works, you may have AF less often, it may be mild and you may see a decrease in symptoms. It is still likely however that you will experience AF again.

**Catheter ablation** – If medications do not work, a procedure called a catheter ablation can be used to return the heart to its normal rhythm. *See page 11.*

**Surgical ablation** – This treatment requires a more invasive approach then a catheter ablation procedure. *See page 13.*

**Cardioversion** – Your doctor may offer cardioversion as one treatment option to control your heart rhythm. *See page 10.*

**RATE CONTROL**

Rate control is another method your physician may use to slow down the heart rate and pulse into a normal range. This means that although you will still have an irregular heart beat, your heart is not beating at a faster pace than normal. In order to manage your heart rate, your physician will use medications or an ablation procedure.

**Medications** – Rate control medications are used to slow down the pulse. These medications slow the electrical signals passing through the AV node, the electrical bridge between the upper and lower chambers of the heart. These medications are known as “AV node blockers” because they keep one signal at a time passing through the AV node and block the multiple electrical impulses caused by AF; thus slowing down the rate at which the ventricles are pumping.
There are several types of AV node blockers that work in different ways. You and your doctor will decide which medication is the best treatment option for you and your AF. You may need to try more than one medication to find the one that works best for you and causes the fewest side effects.

In some cases, depending on the person, the type of AF or the cause of the AF, these medications do not work.

**AV node ablation** – In cases where medications fail, a procedure called an AV node ablation can also be used to slow down the pulse and maintain rate control. AV node ablation is a non-surgical procedure that is done in an electrophysiology lab in the hospital by a team of highly skilled nurses and technicians who work alongside the electrophysiologist, a doctor who specializes in treating heart rhythm conditions.

In this procedure thin, flexible wires called catheters are inserted into a vein in your groin. This wire is threaded up through the vein and into the heart using X-rays to guide the way. There is an electrode at the tip of the wire. This electrode sends out radio waves that create heat. This heat burns, or “cauterizes,” the AV node and damages the electrical system. When this is done, no signals are able to travel from the atria of the heart to the ventricles.
Because the bottom chambers are no longer receiving any electrical signals and therefore cannot pump blood out to the rest of your body, you will need to have a permanent electrical pacemaker implanted. A pacemaker is a device that sends electrical impulses to the ventricles to keep the ventricles beating. The combination of AV node ablation and pacemaker implantation works very well to control the pulse without the need for heart rhythm medications. However, you will need to continue to take a blood thinner. It is important to understand that you will now depend on the pacemaker to keep your heart beating.

You should talk to your doctor about the risks and benefits of an AV node ablation.
STROKE PREVENTION

The most common risk for people with atrial fibrillation (AF) is having blood clots form in the heart. This makes it very important for your doctor to diagnose AF and decide if you need medication. AF needs to be treated whether or not you are having any symptoms.

AF itself is not life-threatening. However, if left untreated, the side effects of AF can be potentially life-threatening. AF makes it harder for the atria (the upper chambers of the heart) to pump blood to the ventricles (the lower chambers of the heart). With the blood moving more slowly it can pool and is more likely to form clots. About 15 percent of people who have a stroke also have atrial fibrillation. The risk of stroke from AF increases with age and is closely linked to the presence of other risk factors such as heart disease, high blood pressure and an enlarged heart.

THE RISK OF STROKE

When blood clots form in the heart, they can travel anywhere in the body. As these clots travel through the body, they get stuck in arteries and stop blood flow in those arteries. Important organs may be damaged or stop working because of blocked blood flow. If a blood clot forms and travels to the brain, it can cause a stroke. AF increases the risk of stroke by 500 times.

A blood clot can interrupt blood flow to the brain and cause a stroke.
percent. This makes it very important for your doctor to diagnose AF and decide if you need medication. AF needs to be treated whether or not you are having any symptoms.

Your doctor may ask you about your complete medical history to figure out if your AF increases your risk of having a stroke. These questions could include:

- Other medical conditions such as hypertension, diabetes or heart failure
- Illnesses you have had in the past
- Medications you take or have taken
- Any surgeries or procedures you have had
- Vaccinations and immunizations (shots)
- Past broken bones, car accidents or injuries

**PREVENTING STROKE**

If you have an increased risk for a stroke, your doctor may ask you to begin anticoagulation therapy. This means you would be taking a medication that makes it harder for your blood to clot. Some AF patients are asked to take aspirin to thin the blood. Others may be asked to take medicines called anticoagulants or blood-thinners. The most common blood-thinners are warfarin (Coumadin®) or dabigatran (Pradaxa®).

Using medication to thin your blood increases your risk of bleeding. Your doctor must carefully weigh the risks and benefits of your taking blood-thinners. In other words, your doctor has to decide if the risk of a stroke from your AF is worse than the risk of major bleeding from taking the blood-thinning medicine. The good news is that research has been done on this question. Based on this research, tools have been created to help your doctor "score" the risk factors. This score will determine if you need anticoagulation therapy and if you do, what type of therapy will work best for you.

If you do start taking blood blood-thinners, it is important that you take the correct amount. You will need to have your blood checked regularly to make sure that your blood is thinned to the proper level. If you take too much, you are at risk to start bleeding. If you do not take enough, you are still at risk to get a blood clot.
Blood thinning medications do not work the same way for every person. Many factors, including other medications that you take and your diet, can affect how well they will work for you. Some types of foods can cause certain blood thinners to be less effective. The foods that may cause an interaction are typically green, leafy vegetables and foods high in vitamin K. As with any medical treatment there are risks and side effects. Patients should discuss these with their doctor prior to starting a blood thinning therapy.

**STROKE SYMPTOMS AND RESPONSE**

If you or someone you know experiences any of the following stroke symptoms, call 911 immediately:

- **Sudden** numbness or weakness of face, arm or leg, especially on one side of the body
- **Sudden** confusion, trouble speaking or understanding
- **Sudden** trouble seeing in one or both eyes
- **Sudden** trouble walking, dizziness, loss of balance or coordination
- **Sudden** severe headache with no known cause

Use this simple test to help identify symptoms and properly respond!

<table>
<thead>
<tr>
<th><strong>ACT F.A.S.T.</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FACE</strong></td>
<td>Ask the person to smile. Does one side of the face droop?</td>
</tr>
<tr>
<td><strong>ARMS</strong></td>
<td>Ask the person to raise both arms. Does one arm drift downward?</td>
</tr>
<tr>
<td><strong>SPEECH</strong></td>
<td>Ask the person to repeat a simple sentence. Are the words slurred? Can they repeat the sentence correctly?</td>
</tr>
<tr>
<td><strong>TIME</strong></td>
<td>If the person shows any of these symptoms, time is important. Call 911 or get to the hospital fast. Brain cells are dying.</td>
</tr>
</tbody>
</table>

Note the time you experienced your first symptom. This information is important to your health care provider and can affect treatment decisions.
STROKE RISK QUESTIONS FOR YOUR DOCTOR

If you have been diagnosed with AF, it is important to talk to your doctor about how to reduce your stroke risk. Here are a few suggestions:

• Based on my medical history and any other medical problems, what is my risk level for having a stroke?
• How can I better control my AF and other risk factors for stroke?
• Will any of my medications interact negatively with my treatment for AF?
• In the event that I or someone else recognizes someone who might be having a stroke, where can I find a certified stroke center in my community?
The Society also offers a variety of diagrams and medical animations related to atrial fibrillation on www.HRSonline.org/patientinfo.
AF 360° provides a single, trusted resource for the most comprehensive and relevant information and education on atrial fibrillation. Led by the most respected professionals and drawing from top experts, publications and other leading sources, AF 360° helps cardiac arrhythmia professionals improve patient outcomes. AF 360° is an initiative of the Heart Rhythm Society, the world’s leading professional society committed to improving the care of cardiac arrhythmia patients by promoting science, education and optimal health care policies and standards. To learn more about AF 360° or the Heart Rhythm Society, visit www.HRSonline.org

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Heart Rhythm Society
1400 K Street NW
Suite 500
Washington, DC 20005

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