Understanding atrial fibrillation
Learning more about atrial fibrillation

Atrial fibrillation (AF) is an irregular and often rapid heart rate that can increase your risk of stroke, heart failure and other heart-related complications.

During AF, the heart’s two upper chambers beat irregularly and out of coordination with the two lower chambers of the heart. AF symptoms often include heart palpitations, shortness of breath and weakness.

Episodes of AF can come and go, or you may develop AF that doesn’t go away and may require treatment. Although AF itself usually isn’t life-threatening, it is a serious medical condition that sometimes requires emergency treatment.

It may lead to complications. AF can lead to blood clots forming in the heart that may circulate to other organs and lead to blocked blood flow (ischemia). Treatments for AF may include medications and other interventions to try to alter the heart’s electrical system.

**Acute conditions**

Excessive alcohol consumption is one acute condition associated with AF. The medical term, “holiday heart syndrome,” refers to the excessive consumption of alcohol that sometimes occurs with holiday celebrations and is associated with a spike in the number of people showing signs of developing AF.

Other acute conditions relate to medical factors such as:

- Surgery
- Lung disease, such as pneumonia
- Asthma attacks
- Extreme body stress
- The occurrence of a metabolic disorder, such as hyperthyroidism (overactive thyroid gland)
- An inflammation of the lining of the heart

**Having a heart attack also increases the risk of AF.**

Many of the acute conditions listed can cause chemical imbalances that may lead to electrical imbalances in your heart, triggering AF. However, once the necessary balance is restored, such as when the pneumonia is cured or alcohol is eliminated, the AF usually disappears on its own.

**Doctors tend to label AF by its pattern of occurrence:**

- **Paroxysmal AF** is when episodes last 7 days or less (often less than 24 hours) and usually stop on their own.

- **Persistent AF** is when episodes last longer than 7 days and may require treatment before the episode stops.

- **Permanent AF** is when episodes last longer than a year.

- **Recurrent AF** is when an individual has two or more AF episodes, whether the arrhythmia stops on its own or must be stopped with therapy.
Atrial fibrillation causes and risk factors

**Chronic conditions**

A number of chronic or long-term conditions result in atrial enlargement, which in effect stretches out the electrical “wiring” of the two upper heart chambers, making short circuits and sparks (and thus AF) more likely. Additionally, AF may be associated with hypertrophic, dilated or various other heart diseases that change the shape of the heart, interfering with the heart’s intricate electrical system.

Long-standing lung problems such as COPD (chronic obstructive pulmonary disease) can also predispose individuals to AF.

Alcohol abuse – or the regular, excessive, long-term consumption of alcohol – is closely linked to a higher risk of developing AF. A study carried out by scientists at Beth Israel Deaconess Medical Center showed that risk of AF was as much as 45% higher among heavy drinkers than abstainers.

Smoking has been linked to several heart problems, including AF. So has excessive caffeine consumption, which includes too many coffees, energy drinks, and/or sodas or pop (fizzy drinks). Many of these beverages have caffeine in them.

Two other common conditions that can lead to AF are obesity and sleep apnea. In a study of more than 3,400 adult patients who never had AF, 14% ended up being diagnosed with AF after several years of follow-up. Beyond the typical risk factors mentioned previously, the incidence of AF was strongly predicted both by obstructive sleep apnea and excess weight.

**Chronic conditions include:** existing heart problems, such as congenital heart defects, or heart valve diseases, such as those related to prior rheumatic fever.
Atrial fibrillation causes and risk factors

• Excess weight
  Studies and other findings are showing that obesity can actually change the size of the heart’s atria, with an increase in atrial size occurring as one’s body weight increases from normal, to overweight, to obese. Weight loss has been shown to reduce atrial size, indicating that losing the added weight may decrease the risk of developing AF.

• Sleep apnea
  People with this condition do not breathe normally or regularly during sleep. Instead, breathing pauses or becomes very shallow, with abnormal breathing episodes lasting a few seconds up to several minutes. These episodes can occur anywhere from 5 to 30 or more times per hour, disturbing restful sleep and increasing the risk of AF. More than 25 million US adults are estimated to have obstructive sleep apnea, and the incidence of AF is about 5 times greater in people with apnea as compared to people who do not have this sleep disorder.

Risk factors
There are several well-established risk factors for atrial fibrillation (AF) including: coronary artery disease, heart failure, rheumatic heart disease (which affects the values of the heart) and congenital heart abnormalities (inherited heart defects).
Cardiac risk factors such as hypertension and diabetes can play a role in damaging the atria of the heart, leading to AF.
There are a number of temporary, as well as chronic conditions, that lead to this rhythm abnormality. For the most part, when the temporary condition ceases or is treated, AF is usually resolved. In the case of chronic conditions, treatment should target both the AF and the chronic problem that is contributing to the risk of AF-associated events.

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The symptoms of atrial fibrillation

Following is a list of most of the common symptoms of AF. Keep in mind, though, that some of these signs and symptoms are similar to ones you can experience when your heartbeat increases with vigorous physical exercise:

- **Fast heartbeat** – usually over 140 beats per minute. You can take your own pulse by placing a finger on your wrist or neck. If you were exercising, wait a few minutes to see if your heartbeat goes back to your normal rate, which should be between 60 – 100 beats per minute.

- **Lightheadedness** – which, in medical terminology, differs from dizziness. A person with lightheadedness feels as if he/she is going to faint.

- **Dizziness** – the feeling that you are spinning or moving

- **Confusion**

- **Palpitations** – a racing, uncomfortable sensation in the chest, or a flopping in the chest

- **Breathlessness**

- **Weakness**

- **Chest pains during physical exertion**

- **Angina** – chest pain or discomfort that occurs when the heart muscle does not get enough blood. Angina is more likely if the heartbeat is very fast and the heart is being put under a lot of strain.

- **Hypotension** – low blood pressure

- **Heart failure** – a condition in which the heart does not pump blood throughout the body efficiently

- **Disorders of the heart muscle**

If you have any of these symptoms or think you may have AF, you should contact your doctor and be tested.

Of course, you may not have any signs or symptoms and still have AF. Then the condition can only be detected during a routine medical examination or after a health problem.
First, set up an appointment with your doctor. A doctor will usually start by looking at your personal medical history as well as your family history. The information from you will help your doctor understand your specific symptoms and how severe they may be, as well as define your AF clinically (e.g., paroxysmal, persistent or permanent).

If you received any treatment for AF before seeing your doctor (for example, if paramedics administered a drug or defibrillation therapy), your doctor will want to review your response to such therapy.

**Primary tests**

During the examination, you will likely have an electrocardiogram, known as an ECG or an EKG. This is a non-invasive test in which adhesive patches (called electrodes) are attached to your chest to detect and record the electrical activity of your heart. This test allows your physician to see a number of heart irregularities and conditions, including whether you may have had a previous heart attack.

A portable or “ambulatory” EKG monitor records your heart’s activity continuously for a period of time. An “event monitor” records only when you press a button to indicate that you’re feeling symptoms.

An echocardiogram (echo) is another type of non-invasive test. The echo creates a video of your heart as it beats, shows the size and shape of the chambers and valves and can also detect damage. A standard echo is referred to as a TTE. A more invasive echo, called a TEE, is used if a clearer picture is needed or to detect possible atria clots.
Testing, screening and diagnosis

Other tests

• Blood tests
Your doctor may order blood tests, primarily to measure thyroid function or to evaluate kidney and liver function, to see if there are any limitations with regards to the medications you might require.

• Exercise tests
Your doctor may order exercise tests, especially if the AF is prolonged or considered permanent, to help determine whether your heart rate is under control.

• X-rays
You may have your chest X-rayed to get a better assessment of your lungs, especially if there is any suspicion of pneumonia or other lung disease.

• Cardiac electrophysiology
If necessary, you may undergo an electrophysiology study, which is the science of measuring the electrical potential of the body. The cardiac electrophysiology usually requires more invasive methods, such as inserting a special cardiac catheter to record both ongoing electrical activity of the heart as well as responses to specific stimulation of the heart.

The test is not a routine test, and is not performed with all patients. It is usually reserved for patients who have failed drug treatment and are being considered for ablation therapy (see the section below, on alternatives to drug therapy).

The standard echo or transthoracic echocardiogram (TTE) test is the more common echo test. A trained sonographer performs the test and the heart doctor interprets the results. An instrument called a transducer releases high-frequency sound waves directed toward the heart. The transducer picks up the echoes of the sound waves and transmits them as electrical impulses that are converted into moving pictures of the heart. The echocardiogram allows doctors to see the heart beating, and to view the heart valves and other structures of the heart.

The transesophageal echocardiogram (TEE) is a less common but more invasive testing procedure that may be used if a clear picture of the heart cannot be obtained with a standard echo. This procedure involves numbing the back of your throat so a scope can be inserted using special echocardiography probes. On the end of the scope is a device that sends out sound waves that are used to obtain a clearer echocardiogram of your heart.
Atrial fibrillation can be challenging to treat, but the objectives are to:

- Prevent blood clots from forming
- Control the heart rate, focusing on how many times per minute the heart beats
- Restore the heart to a normal rhythm, which helps the heart’s chambers work together more efficiently
- Treat underlying conditions that may be causing or worsening the AF, such as overactive thyroid function or other imbalances including various cardiac diseases

There are different strategies to treat AF, and the goal may be to achieve some or all of the above objectives. Which approach is best for you depends on various factors, including whether you are currently being treated for other heart or medical problems.

Sometimes you may need a combination of treatments, as described below, to effectively treat your AF.

**Prevention of blood clots**

The two most common drugs used to prevent blood clot formation (and reduce the risk of stroke) are warfarin and aspirin. Warfarin (more commonly known as Coumadin) is more effective than aspirin for preventing stroke due to blood clots.

Aspirin is usually the standard treatment for patients under 75 years of age who are without other risk factors for stroke.

If you have only one moderate risk factor for stroke in addition to AF (such as hypertension, diabetes, or heart failure), either aspirin or warfarin may be considered to reduce stroke risk.

If you have at least one high-risk factor (e.g., you’ve had a previous stroke or transient ischemic attack (TIA), or are older than 75), you most likely will receive warfarin.
Treatment

Heart rate control
To slow the heart rate, doctors usually rely on beta-blockers or calcium channel blockers. Other agents can also be prescribed, depending on your particular needs. Beta-blockers and calcium channel blockers, while relatively safe, can dramatically lower blood pressure and slow your heart rate. Your doctor will want to carefully monitor the effects of these medications.

Rhythm control
Ideally, you want to get your heart back to its normal rhythm; however, this objective becomes more difficult the longer you have AF. To convert the heart to a normal rhythm, your doctors may use cardioversion, which is defined as the conversion of one cardiac rhythm or electrical pattern to another. This is accomplished with drug therapy or medical procedures.

When medications are used, your doctor will carefully monitor their effects. Ongoing research is evaluating newer agents that may improve on the effectiveness or safety of the currently available antiarrhythmic drugs. It is always recommended to periodically check with your doctor to see if any of the new medications would be more beneficial in your particular case.

Alternatives to drug therapy
When medications do not work, there are alternatives. Electrical cardioversion uses a jolt of electricity to your heart, either through paddles or wired patches attached to your chest. It is a controlled procedure and is conducted under light anesthesia in the hospital, and you usually go home the day of the procedure.

Another option is catheter ablation, which targets and destroys small areas of cells in the heart thought to be the source of the electrical malfunction. In this technique, a catheter is threaded into your heart and radio waves are emitted to selectively cauterize the errant heart cells. This procedure usually improves a patient’s heart function, exercise capacity and quality of life.

Not all patients undergoing ablation have their arrhythmia completely eliminated by the procedure. However, many patients still experience greatly improved heart rate control.

The result of ablation may be drug therapy that failed to control heart rate in the past may be effective once again. Between those patients experiencing an effective “cure” and those who see great improvement following ablation, the overall success rate of this procedure is about 70 to 80%.
Another rhythm-control strategy is the maze procedure, which often requires open heart surgery, because the clinician must make precise, small cuts (or possibly catheter burns) in specific places on the atria. The procedure’s name comes from the maze-like pattern of incisions made in the atria. Usually, the maze procedure is only performed when open heart surgery is required for other reasons.

**Rate versus rhythm control**

The best-case scenario occurs when treatment provides both effective heart rate and heart rhythm control. However, there has been a great deal of discussion as to which approach is better: rhythm control or rate control.

- Rhythm control focuses on the restoration of normal heart rhythm that will lower the risk of stroke, reduce symptoms, improve exercise tolerance, quality of life and perhaps medication reduction or stoppage.

- Treatments for controlling heart rate make more sense in other patients, especially as the rate-control drugs are usually much less toxic than antiarrhythmic therapy.

Research has been conducted in two different studies that compared the two strategies to see if either presents a survival advantage over the other. In both studies, there was no significant difference in terms of mortality rates between patients assigned to therapy to control heart rate and those receiving therapy for rhythm control.

Because of the greater spectrum of side effects seen with rhythm control, the investigators concluded that heart rate control should be the first approach to treatment in similar patients with advanced heart failure.

Which approach is right for you will be determined in the context of your overall health situation with your personal physician’s recommendation and advice to you.

The best-case scenario occurs when treatment provides both effective heart rate and heart rhythm control.
Prevention

For some people, AF is not preventable. However, adopting a balanced, healthy lifestyle will often reduce the risk of developing a heart condition such as AF. Engaging in regular exercise, eating heart-healthy foods, maintaining a healthy weight, and avoiding activities such as smoking and binge drinking will help to maintain and/or improve your heart’s overall health.

There are recommended steps for achieving a healthy lifestyle and lowering your risk for heart disease and atrial fibrillation, especially if you know you are at risk of developing AF, based on your family history.

• Follow a heart-healthy diet that’s low in saturated fat, trans fat and cholesterol. A healthy diet includes a variety of whole grains, fruits and vegetables consumed on a daily basis.

• Quit smoking (if you currently smoke).

• Be physically active.

• Avoid heart stimulants, since intake of OTC medications and caffeine products can often trigger AF episodes or increase their frequency.

• Maintain a healthy weight, which may mean losing some weight.

• Make sure that hypertension or other conditions that can lead to heart disease are treated and well managed.

Treat your heart well

We have covered a number of areas regarding AF: what it is, why it should not be ignored, how it may be treated, as well as how it can be prevented. AF does not preclude an active life and is usually controllable with treatment.

The biggest danger with AF is to leave it untreated. AF weakens the heart’s atrial chambers, making it harder for them to contract properly, causing more blood to pool in the atria, and raising the risk of blood clotting, stroke and heart failure.

If you are unsure if you have AF, contact your doctor to schedule an exam. If you do find out you have AF, treating it correctly is the best way to reduce your stroke risk and maintain your quality of life.

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