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Atrial Fibrillation

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Definition of Atrial Fibrillation
Atrial fibrillation (AF) is a particular type of heartbeat (arrhythmia) characterized by an extremely fast irregular rhythm.

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Description of Atrial Fibrillation
 When at rest, the healthy heartbeats between 60 and 90 times a minute, with the atria (the two upper chambers of the heart) beating slightly earlier than the ventricles (the two lower chambers of the heart). The rate and timing of contractions (beats) are regulated by electrical impulses generated by the sinoatrial node (a specialized group of cells that produce small amounts of electrical energy). In AF this orderly sequence of events is interrupted. As a result, the heart quivers or fibrillates (beats faster and irregularly), with the atria contracting up to 500 times a minute, and the ventricles contracting up to 180 times.

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People with AF are five (5) times more likely to have a [stroke](#). AF causes the heart to lose efficiency. The irregular beating of the atria and ventricles means the volume of blood pumped with each heartbeat varies causing pooling, stagnation and thickening of the blood. This thickening (coagulation) forms blood clots that can travel from the heart to the brain causing an embolic stroke.

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Persons with AF should ask their doctors about the risks that accompany their arrhythmia and should be aware of the advantages and disadvantages of the available treatment strategies for preventing embolic strokes.

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warfarin or aspirin therapy probably exceed its potential benefit.

For individuals at lower risk, taking some measure to prevent embolic strokes should be strongly considered.

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Causes and Risk Factors of Atrial Fibrillation

There are three different categories of causes:

1. *Systemic disease or metabolic abnormality*: includes conditions such as hypoglycemia, [hyperthyroidism](#), [diabetes](#), acute pulmonary disease (pneumonia, [asthma](#), [chronic obstructive pulmonary disease](#) or pulmonary embolus) and drug/alcohol abuse.
2. *Cardiovascular disease*: includes conditions such as high blood pressure, mitral valve disease, [coronary artery disease](#), [congestive heart failure](#), heart valve or rheumatic heart disease to name a few. Additionally a history of stroke or previous [heart attack](#) can put you at risk.
3. *No underlying disease state*: There are three types: lone [atrial fibrillation](#), paroxysmal atrial fibrillation and sick sinus syndrome. Lone atrial fibrillation has no identifiable underlying cause and can occur any time for no apparent reason. Paroxysmal atrial fibrillation is a common form of atrial fibrillation (40 percent of the cases) that occurs sporadically. There may be symptoms for a few minutes or hours and then a long period without any problems. Sick sinus syndrome is the inability of the sinoatrial node to perform its pacemaking function.

Symptoms of Atrial Fibrillation

Some people may have no symptoms, while others experience:

- [heart palpitations](#) (described as "pounding", "racing" or "fluttering" heart)
- shortness of breath
- weakness or fatigue
- dizziness
- faintness
- light-headedness or mild to severe chest pains

Diagnosis of Atrial Fibrillation

If AF is suspected, a routine clinical evaluation consisting of a medical history (including history of alcohol and drug abuse), a thorough physical examination, standard screening laboratory tests (such as thyroid function test), and an electrocardiogram (ECG) which records the heart's electrical activity and a chest x-ray will be done. These tests will identify most of the systemic diseases mentioned above.

If no systemic or metabolic abnormality is found, a heart scan with endoscopy called a transesophageal echocardiogram (TEE) will sometimes be recommended to detect any underlying structural [heart disease](#). A transesophageal echocardiogram uses ultrasound waves to obtain images of the heart structure and function by inserting a small, microphone-like transducer which is attached to the end of an endoscope, into the esophagus.

Treatment of Atrial Fibrillation

If you have AF, non-invasive treatments include the following:
Preventing blood clots. An anticoagulant drug called warfarin (Coumadin) is given. Anticoagulants are a group of drugs used to treat and prevent abnormal blood clotting. By disrupting the blood clotting mechanism, these drugs prevent an

abnormal blood clot from forming. When a blood clot already exists, these drugs stop it from enlarging and reduce the risk of it breaking off and traveling to the brain. Aspirin is also an anticoagulant, but doctors prefer warfarin. Taking warfarin requires periodic monitoring of how well it is keeping the blood thin. This is done by taking a blood test to monitor clotting times. Based upon the results of the test, the dose of warfarin may be either increased or reduced.

Reducing heart rate. There are three classes of heart-function drugs that can be used alone, or in combination to reduce the heart rate. They are digitalis drugs, beta blockers drugs and calcium channel blocker drugs. Digitalis drugs (such as digoxin (Lanoxin)) are used to increase the force of heart muscle contractions, making the heart work more efficiently. They also slow down abnormally rapid nerve impulses as they pass through the atria to the ventricles. This action allows the ventricles time to fill up with blood and empty normally with each contraction. Beta blockers such as atenolol (Tenormin), metoprolol (Lopressor), or propranolol (Inderal) are used to slow heart rate and reduce the force of contraction of the heart muscle. **Calcium channel blockers** such as verapamil (Isoptin) or diltiazem (Cardizem) are used to slow the passage of nerve impulses through the heart muscle.

Restoring normal heart rhythm. To put patients back into "normal sinus rhythm" (NSR) doctors will sometimes use cardioversion or defibrillation. There are two types of cardioversion, drug cardioversion and electrical cardioversion. Drug cardioversion uses Type 1 antiarrhythmic medications such as Quinidine, Procainamide and Amiodarone to correct irregular heartbeats to a normal rhythm and to slow an overactive heart. The electrical cardioversion (defibrillation) is the choice of most doctors. This technique delivers an electrical current to the heart through two metal plates (paddles) placed on the chest. The sudden burst of electricity through the heart converts the fibrillation back into NSR. After heart rhythm returns to normal, warfarin should be continued for a month. Some patients, with other heart diseases may need an anticoagulant for the remainder of their life. Most patients also need ongoing therapy with beta blockers, calcium channel blockers or other heart-function drugs.

Invasive treatments

In 10 percent of all cases, AF cannot be managed with medications and patients continue to have episodes despite drug treatment. In such cases, there are several invasive procedures available.

The most common is called catheter ablation (CA). A flexible tube called a catheter and miniature instruments are inserted into the heart through a blood vessel. Using radiofrequency energy the atrioventricular node is destroyed. This prevents the fibrillating atria from sending excess electrical impulses to the ventricles. In almost all cases this procedure causes a complete block of the heart's electrical impulses and a pacemaker must be installed to establish normal heart rhythm. More recently, a procedure called pulmonary vein isolation (also called pulmonary vein ablation) has been developed. This procedure uses radiofrequency energy to create scars on the four pulmonary veins to prevent them from initiating electrical impulses to the atria, thus preventing AF. The procedure has shown promise, with success rates greater than 80% in some centers. There are some complications, however, related to the scarring.

Additionally, there is a surgical procedure called the Maze Procedure. In this open-heart surgery, a maze of incisions made in the atria blocks the flow of excess electrical impulses within the chambers. This prevents the development of a chaotic atrial rhythm and allows the impulse from the sinoatrial node only to get to the atrioventricular node. This procedure is reserved for patients whose symptoms are severe, the AF cannot be controlled by medications, and for patients with AF who are undergoing heart surgery for other reasons.

Questions To Ask Your Doctor About Atrial Fibrillation
What tests need to be done to determine if it is atrial fibrillation?

What is the cause of atrial fibrillation?

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How serious is it?

What type of treatment will you be recommending?

Will you be prescribing any medication?

What are the side effects?

How successful is this treatment?

Should a specialist be consulted?

What are the chances this could happen again?

Could this cause a heart attack, a stroke?

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