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Atrial Fibrillation

Atrial fibrillation (AF) is an abnormal fast irregular heartbeat. An [abnormal heartbeat rhythm](#) is called an arrhythmia. A normal heart rate is between 60 and 100 beats a minute (bpm) when you're resting. In AF the heart rate can sometimes be very fast (often between 140 and 180 bpm) as well as being irregular.

What is atrial fibrillation?

The heart has four chambers - two atria and two ventricles. The walls of these chambers are mainly made of special heart muscle. Normally, the contractions of your heart are controlled by a sophisticated electrical system that keeps the four chambers contracting regularly, in the correct order.

In AF the normal controlling timer in the heart is overridden by many random electrical impulses that fire off from the heart muscle in the atria (the two upper chambers of the heart). The atria then quiver randomly (fibrillate). This means that the atria only partially squeeze (contract) - but very rapidly (up to 400 times per minute).

Only some of these impulses pass through to the ventricles and they do so in a very random and haphazard way. Therefore, the ventricles contract anywhere between 50 and 180 times a minute but usually between 140 and 180 times a minute. The ventricles contract not only in an irregular way but also with varying force.

For more information, see the separate leaflet called [Abnormal Heart Rhythms \(Arrhythmias\)](#).

What are the symptoms?

Many people with AF have no symptoms, particularly if their heart rate is not very fast. The AF may then be diagnosed by chance when a doctor or nurse feels your pulse. Your pulse rate may be fast, the rhythm is irregular and the force of each beat can vary.

Any symptoms usually start suddenly, soon after the AF develops. Possible symptoms include:

- **A 'thumping' heart (palpitations)**. This means that you become aware of your heart. You may feel it beating in a fast and irregular way.
- **Dizziness**.
- **Chest pains (angina)** may develop. The pains tend to occur when you exert yourself but they may also occur even when you are resting.
- **Breathlessness** is often the first symptom that develops. It may occur all the time but you may become breathless just when you exert yourself, such as when you walk up stairs.

Types of atrial fibrillation

There are three different types of AF:

Paroxysmal AF

- Paroxysmal AF means that you have episodes of AF that come and go.
- Each episode comes on suddenly but will also stop suddenly without treatment within seven days (usually within two days). The heartbeat then goes back to a normal rate and rhythm.
- The period of time between each episode (each paroxysm) can vary greatly from case to case.
- Although paroxysmal AF means that it will stop on its own, some people with paroxysmal AF take treatment to stop it as quickly as possible after it starts.

Persistent AF

- Persistent AF lasts longer than seven days and is unlikely to revert back to normal without treatment. However, the heartbeat can be reverted back to a normal rhythm with treatment.
- Persistent AF tends to come and go so it may come back again at some point after successful treatment.

Permanent AF

- Permanent AF is long-term and the heartbeat does not return back to a normal rhythm.
- This may be because treatment has been tried and was not successful, or because treatment has not been tried.
- People with permanent AF are treated to bring their heart rate back down to normal but the rhythm remains irregular.

Why is it important to know about atrial fibrillation?

Some people with AF don't have any symptoms and don't know they have it. Even without symptoms, it's important to diagnose AF because the abnormal rhythm can cause blood clots to form in the heart. Most people with AF need to take a medicine to thin the blood to [stop any blood clot](#) from forming. If a clot does form then it may travel in the blood vessels to your brain and cause a stroke.

What are the causes of atrial fibrillation?

In about 1 in 10 cases of AF there is no apparent cause. The heart is otherwise fine and there are no diseases to account for it. This is called lone AF.

There are many conditions that may cause AF, including the following:

- [High blood pressure is the most common cause](#). High blood pressure puts a strain on the heart muscle.
- AF is a common complication of various heart conditions. For example:
 - AF is a complication of coronary heart disease. Coronary heart disease is the condition that causes [chest pains \(angina\)](#) and heart attacks and is common in older people.
 - Various other heart problems may also trigger AF to develop. For example, AF occurs in some people with [heart valve problems](#), [pericardial disease](#), [dilated cardiomyopathy](#) and [hypertrophic cardiomyopathy](#).
- Other conditions and situations that may trigger AF to develop include:
 - An [overactive thyroid gland \(hyperthyroidism\)](#).
 - [Pneumonia](#).
 - COVID-19 infection.
 - [Pulmonary embolus](#).
 - [Obesity](#).
 - [Lung cancer](#).
 - [Drinking a lot of alcohol](#).
 - [Drinking a lot of caffeine](#) (tea, coffee, etc).

How common is it?

AF is common but mainly occurs in older people. Just under 2 in every 100 people in England have AF and the numbers are rising because of the increasing numbers of elderly people. AF is uncommon in younger people unless they have certain heart conditions.

Do I need any tests?

- [A heart tracing \(electrocardiogram, or ECG\)](#) confirms the diagnosis as long as it's performed during an episode of AF. Sometimes a [24-hour ECG](#) is needed if your AF comes and goes and the resting ECG has not shown it.
- You will usually have other tests such as blood tests and [an ultrasound scan of the heart \(echocardiogram, or 'echo'\)](#). These tests look for an underlying cause of AF, such as a heart problem or an overactive thyroid gland.

Editor's Note

Dr Sarah Jarvis, 12th January 2022

KardiaMobile for diagnosing atrial fibrillation

Many people with AF are in paroxysmal AF - so their heart rhythm is normal some of the time. This means that a standard ECG may not pick up the fact that they have episodes of AF.

KardiaMobile is a portable ECG recorder that can help detect AF. The National Institute for Health and Care Excellence (NICE) has issued new guidance recommending that KardiaMobile can be used to diagnose AF in people who have symptoms such as palpitations if they are suspected of having AF.

This means that a doctor may recommend that you use this device instead of being referred for 24-hour ECG monitoring.

You can read more about NICE's recommendations from the further reading link at the end of this article.

What is the treatment for atrial fibrillation?

The treatment for AF either controls the heart rate or changes the rhythm back to normal.

Because of the risk of blood clots forming and causing a stroke, the treatment always, except in people at very low risk, includes medication to prevent blood clots (anticoagulation). **See the separate leaflet called [Atrial Fibrillation and Stroke Prevention](#)**. This is in addition to rate or rhythm treatment below.

Rate control treatment

In untreated AF, the heart rate may be as fast as 180 beats per minute (bpm), although it is more commonly between 120 and 160 bpm. The aim of medication is to bring the heart rate back down to normal (ideally, to less than 90 bpm when resting). If your heart rate is brought down to normal, your heart becomes efficient again and your symptoms usually improve. Your pulse may still feel irregular but not fast.

Several medicines can slow the heart rate down. They include [beta-blocker](#) medicines (such as [atenolol](#) and [propranolol](#)), [calcium-channel blocker medicines](#) (such as [diltiazem](#) and [verapamil](#)) and [digoxin](#). These medicines work by interfering with the electrical impulses of the heart. The medicine chosen may depend on factors such as other heart problems that you may have.

Treatment is usually successful but the dose needed can vary from person to person. Also, in some people a combination of medicines may be needed if the heart rate is not brought down low enough with a single medicine.

Rhythm control treatment

Rhythm control means reverting the erratic heartbeat back to a normal regular rhythm. This is called cardioversion.

One method of cardioversion is to give your heart an electric shock. Another method is to use a medicine that may convert the heart rhythm back to a regular beat. One medicine used for rhythm control is [amiodarone](#). Both of these methods have only limited success. Within a year after cardioversion, the heart has reverted back to AF in about half of cases.

Cardioversion is more likely to be considered as a possible option in certain situations - for example:

- If your AF has developed recently.
- If you are younger than 65 years.
- If an underlying cause for the AF has been successfully treated.
- If you have no other heart abnormality.
- If you have acute heart failure or unstable angina which is being made worse by the irregular heartbeat of AF.

A newer technique that may be used to restore the heart rhythm is called catheter ablation. A long, thin wire (catheter) is passed into the chambers of the heart via a large blood vessel in a leg. The tip of the catheter can destroy tiny sections of heart tissue that may be the cause of the abnormal electrical impulses.

What are the complications of atrial fibrillation?

The main complication of AF is an increased risk of having a stroke. AF causes turbulent blood flow in the heart chambers.

An increased risk of having a stroke (or other blood clot problem)

This **sometimes** leads to a small blood clot forming in a heart chamber.

A clot can travel through the blood vessels until it becomes stuck in a smaller blood vessel in the brain (or sometimes in another part of the body). Part of the blood supply to the brain may then be cut off, which causes a stroke.

The individual risk of developing a blood clot and having a stroke depends on various factors. The level of risk can be calculated by your doctor using a set of specific questions. This will help to decide what treatments are required. All people except those at the lowest risk will be offered medication to help prevent clots from forming.

Read more about [preventing stroke when you have atrial fibrillation](#).

Other complications

Less common complications of AF include the following:

- Heart failure - this develops in some cases. [See the separate leaflet called Heart Failure for more details](#).
- Weakness of the heart muscle (dilated cardiomyopathy). The reason why cardiomyopathy develops in some people with AF is not clear. [See the separate leaflet called Dilated Cardiomyopathy for more details](#).
- If you already have [chest pains \(angina\)](#), the chest pains may become worse if you have AF.

AF can also reduce the amount of exercise you're able to do. It has also been shown that AF can affect some brain functions like memory, attention and reasoning. AF can therefore have a big effect on your quality of life.

Further reading & references

- [2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS](#); European Society of Cardiology (2016)
- [Atrial fibrillation: diagnosis and management](#); NICE guideline (April 2021 - last updated June 2021)
- [Thoracoscopic exclusion of the left atrial appendage in atrial fibrillation \(with or without other cardiac surgery\) for the prevention of thromboembolism](#), NICE Interventional Procedure Guideline, June 2011
- [WatchBP Home A for opportunistically detecting atrial fibrillation during diagnosis and monitoring of hypertension](#); NICE Medical Technologies Guidance, January 2013
- [Atrial fibrillation](#); NICE CKS, October 2020 (UK access only)
- [Isaew A, Adderley NJ, Ryan R, et al](#); The treatment of paroxysmal atrial fibrillation in UK primary care. *Heart*. 2017 Jun 1. pii: heartjnl-2016-310927. doi: 10.1136/heartjnl-2016-310927.
- [Katrtsis DG, Boriani G, Cosio FG, et al](#); European Heart Rhythm Association (EHRA) consensus document on the management of supraventricular arrhythmias, endorsed by Heart Rhythm Society (HRS), Asia-Pacific Heart Rhythm Society (APHRS), and Sociedad Latinoamericana de Estimulacion Cardiaca y Electrofisiologia (SOLAECE). *Europace*. 2017 Mar 1;19(3):465-511. doi: 10.1093/europace/euw301.
- [KardiaMobile for detecting atrial fibrillation](#); NICE Medical technologies guidance, January 2022

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