

Atrial fibrillation

Understanding abnormal
heart rhythm





What is atrial fibrillation (AF)?

AF is a common and serious disturbance of the electrical system of the heart. It is one of a number of conditions commonly referred to as 'arrhythmias' or 'dysrhythmias', where the heart beats with an abnormal rhythm.

If not recognised and correctly treated, AF can result in significant problems, including stroke and heart failure.

The normal heart rhythm

The heart is a highly efficient pump with four chambers (refer to Figure 1). The two chambers on the right side of the heart receive oxygen-poor (blue) blood from the body and pump this blood to the lungs, where it receives oxygen. The oxygen-rich (red) blood returns to the left side of the heart, and the two left chambers pump this oxygenated blood to the rest of the body. The lower (major) pumping chambers, the 'ventricles', receive blood from the top chambers, the 'atria', and do the hard work of pumping the blood to the other parts of the body.

In a normal heart, the atria contract (squeeze) first, pushing blood into the ventricles. The ventricles then contract; the right ventricle pumping the blood out to the lungs and the left ventricle pumping blood to the rest of the body. This process repeats at a regular rate, usually around 60 to 100 times every minute.

Normally, the contraction of the atria is set off by tiny electrical signals that come from the heart's natural 'pacemaker'; a small area of the heart called the sinus node, located in the top of the right atrium. These signals travel rapidly throughout the atria to ensure that all the muscle fibres contract at the same time, pushing blood into the ventricles.

These same electrical signals are passed on to the ventricles via the atrioventricular (AV) node and cause the ventricles to contract a short time later, after they have been filled with blood from the atria. This normal heart rhythm is known as 'sinus rhythm', because it is controlled by the sinus node.

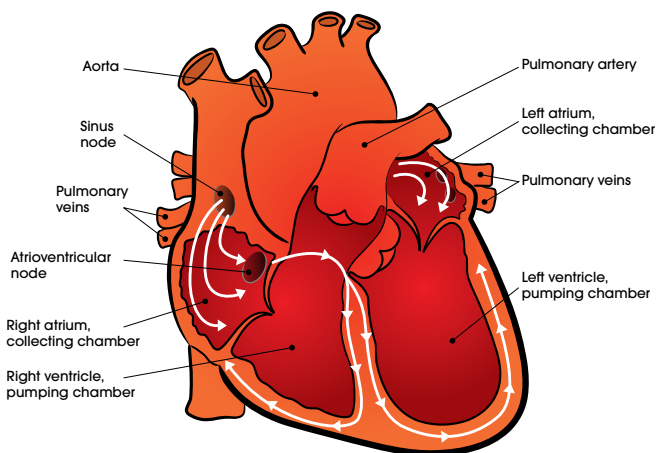


Figure 1. Normal electrical control of the heart beat

What happens in AF?

AF occurs when there are abnormal electrical impulses in the atria. In AF, 'waves' of uncontrolled electrical signals travel through the atria, rather than the normal, highly regulated signals from the sinus node. These waves often start in one or more of the four veins that bring blood from the lungs into the heart (the pulmonary veins). These signals cause the muscle fibres in the atria to contract out of time with each other, and the atria 'quiver' (or, in medical terms, 'fibrillate'). Some of this abnormal electrical activity is passed on to the ventricles, causing a rapid and irregular heartbeat. When the heart is in AF, it is not pumping regularly and, therefore, not working as efficiently as it should be.



What are the symptoms of AF?

If you have AF, you may experience palpitations: you become aware of your heartbeat and you may actually feel irregular 'fluttering' of the heart. This fluttering is caused by the abnormal electrical signals in the atria reaching the ventricles and causing them to beat too rapidly, and in an irregular pattern. Some people may notice that they have an irregular pulse. AF may also cause general feelings of fatigue, weakness, difficulty exercising, discomfort or dizziness. These symptoms occur as the heart is not pumping efficiently. This may result in fainting or collapse.

Some people with AF may not notice any symptoms, however, it is still important to treat the condition, as it can lead to other problems.

Who does AF affect?

AF is one of the most common types of arrhythmia, occurring in about 2% of the general population. The number of people affected by AF increases with age.



Atrial fibrillation (AF) is a type of arrhythmia, a condition in which the heart beats with an abnormal rhythm. If not recognised and correctly treated, AF can result in significant problems, including stroke and heart failure.

What causes AF?

The most common causes of AF are long-term high blood pressure, coronary heart disease (reduced blood flow to the heart caused by clogging of the arteries) or valvular heart disease (problems with the valves of the heart that normally keep blood flowing in the right direction). Another less common, but treatable, cause is hyperthyroidism (an overactive thyroid gland).

AF can also be associated with chest trauma and/or surgery, caffeine intake and drinking too much alcohol. Certain types of medicine, as well as some diseases such as pneumonia, can 'trigger' AF, but sometimes there is no apparent cause – it just happens. Some people experience AF as a one-off episode; in others, it may come and go ('paroxysmal' AF) or persist ('permanent' or 'chronic' AF).

Why is it important to recognise and treat AF?

AF can cause a number of symptoms, as described above, and may indicate an underlying heart or blood vessel disease.

One of the most important problems associated with AF is that it may lead to the development of a blood clot inside the atria. This can happen when the atria are not beating properly. In this situation, the blood does not flow normally through the heart, allowing blood to collect or 'pool', leading to an increased risk of a clot forming. A portion or portions of this clot ('embolus' or 'emboli') can break off and be carried from the heart through the bloodstream into smaller and smaller blood vessels, until they get stuck, potentially blocking the blood supply to important organs. If the blockage occurs in a blood vessel supplying the brain, it can cause a stroke. Without medicines or treatment, the risk of stroke among people aged over 65 years with AF is about one in 20 per year, which is five to six times higher than those of similar age.

The risk may be even higher if the AF is associated with damaged or diseased heart valves, or if the person has a history of high blood pressure, diabetes, heart failure or stroke.

If AF is suspected, a number of tests, including an electrocardiogram (ECG) and echocardiography (ultrasound of the heart) are usually done to confirm the diagnosis and look for any underlying cause (e.g. diseased heart valves) before treatment options are considered.

Is AF 'curable'?

Often, the heart will return to a normal rhythm without treatment. In other cases, a normal heart rhythm may be restored through cardioversion procedures (refer to 'Cardioversion – restoring normal rhythm' below). However, in either case, AF may recur, despite the use of medicines to maintain sinus rhythm.

What treatments are available?

The best treatment for AF depends on a number of factors, including:

- the severity of symptoms
- the cause (if known) and duration of AF
- the person's overall risk of stroke and other problems caused by emboli
- the risks of a particular therapy for that person

Most people with AF will need to take medicine to prevent blood clots from forming. In addition, treatments may be needed to prevent the heart from beating too fast or to restore and maintain a normal heart rhythm.

In some people, such as those with infrequent AF, long-term medicine may be all that is required to treat their condition. In people with chronic AF, cardioversion techniques may be used to restore a normal heart rhythm. If these approaches can't be used or are unsuccessful, ablation procedures may be considered. These methods are described below.

Cardioversion – restoring normal rhythm

For people with a prolonged or particularly serious episode of AF, cardioversion may be used to return the heart to a normal rhythm. After cardioversion, long-term medicines are often prescribed to prevent AF recurring (refer to 'Long-term medicines' below).

Electrical cardioversion

In this procedure, the heart is given an electrical shock (while under an anaesthetic) to help restore a normal rhythm and reduce long-term risks associated with AF. Electrical cardioversion is very safe; the main risk is the procedure could dislodge a blood clot that may have already formed in an atria. This risk is small and reduced further by checking for existing blood clots with a test called a 'trans-oesophageal' echocardiogram (which takes ultrasound images of the heart from inside the oesophagus) and by giving

the person blood-thinning medicines before and after the procedure. Electrical cardioversion only takes a few minutes.

Pharmacological cardioversion

Some medicines (such as flecainide, and amiodarone) can be used to return the abnormal electrical rhythm of the heart to normal. This is known as 'pharmacological cardioversion'. These medicines may be given as tablets or as an injection, and may also need to be taken regularly in the longer term to maintain heart rhythm.

Long-term medicines

For most people with AF, a combination of ongoing medicines will be recommended to help to maintain a normal heart rhythm, slow the rate at which the heart beats and/or reduce the risk of stroke and other problems caused by emboli. This is true, even for many people who undergo cardioversion or ablation procedures. Some of the most common medicines used for these purposes are explained below.

Slowing the heart rate and maintaining normal rhythm

Some medicines, such as digoxin, beta-blockers and some (but not all) calcium channel blockers, help to slow the heart rate by increasing the time taken for the ventricles to fill with blood before they contract and pump the blood to other parts of the body. Others (including sotalol, flecainide and amiodarone) are known as 'antiarrhythmic agents', and work by normalising and maintaining the electrical rhythm of the heart.

Thinning the blood

Most people with AF will be prescribed medicine to thin the blood to prevent clotting. This will decrease your risk of stroke or other problems caused by emboli.

The decision to prescribe one of these blood thinning medicines will be based on a balance between reducing the risk of blood clots and emboli forming and the likelihood of excessive bleeding in an individual patient, which can be assessed by the person's doctor.

Common blood thinning medications include:

Warfarin

Apixiban

Dabigartan

Rivaroxiban

Ask your doctor or pharmacist the following questions about your blood thinning medications:

- What time of the day is it best to take these medicines?
- What do I do if I forget to take the medication on one day?
- Will the dose of my medication change regularly?
- Do I need to have blood tests to monitor how thin my blood is?
- Are there any foods or drinks that I should avoid with these medications?
- Are there any activities, such as heavy lifting or contact sports, that I should avoid?
- What signs of bleeding do I need to be aware of that should prompt me to see a doctor?
- What should I do if I have a fall and I'm taking blood thinners?

Ablation procedures

'Ablation' refers to removing or 'inactivating' small areas of tissue in the body; in the case of AF, the area(s) of the heart responsible for creating or passing on the abnormal electrical signals in the atria. These procedures are not done often and generally only in people whose AF reoccurs, despite cardioversion and ongoing medicine, or in those for whom medicine options are unsuitable.

Catheter ablation

In catheter ablation, a long, thin tube (or 'catheter') is inserted into a blood vessel in the leg and threaded through the vessel, until the tip reaches the heart. The catheter's tip has an electrode that can emit radiofrequency waves to 'burn' and inactivate the target area(s). Catheter ablation may take 1–2 hours. It is performed under a light general anaesthetic.

Surgical ablation

Surgical treatment of AF is very rarely necessary and, usually, only done when other heart surgery is also needed. One technique occasionally used to treat AF is known as the 'maze operation'. In this procedure, a number of lesions are created in the atria of the heart, often around the pulmonary vein, to isolate abnormal electrical currents, stopping them from travelling throughout the atria and causing abnormal beating patterns.

An artificial pacemaker will sometimes be implanted at the same time to take over the electrical control of the heart.

Lifestyle management

In most people, AF can be well controlled, and they continue to lead a relatively normal and healthy lifestyle. However, as AF is often associated with other forms of cardiovascular disease, people with the condition should act to minimise common risk factors for heart disease.

Avoiding smoking, enjoying healthy eating, being physically active, controlling blood pressure and achieving and maintaining a healthy body weight are important ways to minimise the risk of cardiovascular disease. People with diabetes should make sure that their diabetes is well controlled.



Healthy eating

Enjoying healthy eating is important for everybody's heart health. However, people with AF, especially those taking warfarin, may need to pay particular attention to their eating patterns.



Physical activity

People with heart disease get the same benefits from regular moderate physical activity as other people. However, it is recommended that people with AF talk to their doctor or other health professional about the level of activity that is right for them. People taking warfarin may need to avoid particularly physical or competitive sports where there is a significant chance of injury, due to the risk of excessive bleeding.



Alcohol

Avoiding alcohol completely or at least reducing consumption to less than 3 standard drinks a week is important in reducing the intensity, duration, and frequency of atrial fibrillation episodes and symptoms.





When should I seek medical attention?

If you feel your AF symptoms such as palpitations, shortness of breath, dizziness are happening more regularly, check in with your doctor.

If any episode of severe shortness of breath, dizziness or fainting occurs (with or without palpitations), call Triple Zero (000) and ask for an ambulance.

If you experience the warning signs of a heart attack, follow this action plan (see page 14).

If you experience the warning signs of a stroke, think F.A.S.T., Call Triple Zero (000) and ask for an ambulance.

strokefoundation.org.au/About-Stroke/Stroke-symptoms

*Symptoms include tightness, pressure, heaviness or pain in one or more of your chest, neck, jaw, shoulder/s, back or arm/s. This pain or discomfort may start in your chest and spread to these other areas of your upper body. You may not get chest pain at all, but just feel pain or discomfort in one or more of these other areas. You may have a choking feeling in your throat. Your arms may feel heavy or useless. You may also feel short of breath, break out in a cold sweat, experience nausea, and/or feel dizzy or light-headed.

†Symptoms of stroke may include one or a combination of weakness, numbness or paralysis of the face, arm or leg on either or both sides of the body; difficulty speaking or understanding; dizziness, loss of balance or an unexplained fall; loss of vision, sudden blurred or decreased vision in one or both eyes; headache, usually severe and of sudden onset, or unexplained change in the pattern of headaches; and/or difficulty swallowing.

Want to know more?

For more information, call your GP. You can also visit **www.heartfoundation.org.au**

Will you recognise your heart attack?



Warning Signs Action Plan

Do you feel any

pain pressure

heaviness tightness

In one or more of your

chest neck jaw

arm/s back shoulder/s

You may also feel

nauseous a cold sweat

dizzy short of breath

Yes

1 STOP and rest now

2 TALK tell someone how you feel

If you take angina medicine

- Take a dose of your medicine.
- Wait 5 minutes. Still have symptoms?
Take another dose of your medicine.
- Wait 5 minutes. Symptoms won't go away?

Are your symptoms
severe or
getting worse?

or

Have your
symptoms lasted
10 minutes?

Yes

3 CALL 000 Triple Zero and chew 300mg aspirin, unless you have an allergy to aspirin or your doctor has told you not to take it

- Ask for an ambulance.
- Don't hang up.
- Wait for the operator's instructions.

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A note about cardiac rehabilitation

The Heart Foundation and the World Health Organization recommend that all patients with heart disease, including atrial fibrillation, attend an appropriate cardiac rehabilitation and prevention program.

Some hospitals and community health centres run outpatient cardiac rehabilitation programs. These programs continue the gradual increase in physical activity started in hospital and provide you and your family with education, information and support. You should attend a cardiac rehabilitation program as soon as possible after hospital discharge.

The right rehabilitation program will help most people to reduce their risk of further heart problems.

www.heartfoundation.org.au/cardiac-services-directory



For heart health information visit
heartfoundation.org.au

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