

Atrial fibrillation (AF) and stroke

Atrial fibrillation is a type of irregular heartbeat. It means that your heart may not be pumping as well as it should. As a result, blood clots are more likely to form in your heart, increasing your risk of having a stroke. This guide explains what atrial fibrillation is, how it is treated, and how the risk of a stroke can be reduced. It also provides sources of support and further information.

What is a stroke?

A stroke is a brain attack. It happens when the blood supply to part of your brain is cut off. It can be caused by a blockage in one of the blood vessels leading to the brain or by a bleed in the brain. Blood carries essential nutrients and oxygen to your brain. Without blood your brain cells can be damaged or die.

What is atrial fibrillation (AF)?

Atrial fibrillation is the most common heart rhythm disturbance. There are 1.2 million people with AF in the UK and it is more common in older people. Atrial fibrillation makes your risk of a stroke five times higher. So if you have this condition, it's important that you get the right treatment – both to control it and to reduce your risk of stroke.

How does your heart work?

The heart is a muscle that pumps blood around your body. It is made up of four chambers – the two upper chambers (the left and right atria), and two lower chambers (the left and right ventricles).

When your heart beats normally, its muscle walls tighten and squeeze (contract) to force blood out of the heart and around the body. They then relax so your heart can fill with blood. This action is controlled by small electrical impulses and this process is repeated every time your heart beats.

It is your heart pumping blood around your body that produces your pulse. You can feel your pulse by pressing your fingers on your wrist. A normal pulse when you are resting is regular and between 60 and 100 beats per minute. Your heart may beat considerably more than 100 times per minute if you have AF.

Why does AF increase your risk of stroke?

If you have atrial fibrillation your heart is not pumping as well as it should. The upper chambers of your heart contract and relax in an uncoordinated and irregular way due to abnormal electrical activity. If your heartbeat is irregular and fast, your heart may not have a chance to relax and empty properly before filling up with blood again. Blood can collect inside the upper chamber of the left side of

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the heart, and this increases the risk of blood clots forming.

If blood clots form in your heart, there is a risk they can travel in your bloodstream towards your brain. If a clot blocks one of the arteries leading to your brain, it could cause a stroke or TIA.

What causes AF?

Some medical conditions increase your chances of developing AF. These include heart problems such as coronary heart disease, or disease of your heart's valves. It can also be caused by other conditions including an overactive thyroid gland, high blood pressure, lung infections like pneumonia, or a blood clot in the lung (pulmonary embolism).

Drinking too much alcohol or caffeine, taking illegal drugs, such as cocaine or amphetamines, or smoking can also trigger an episode of AF.

What are the symptoms?

Palpitations (being aware of your heart beating fast), breathlessness, chest pain or fatigue are common symptoms of AF. However, some people do not have any symptoms at all and AF is often only diagnosed during a general medical check-up.

The four different types of AF are:

- paroxysmal AF comes and goes – it's not there all the time. Your heart goes back to its normal rhythm without any treatment, usually within 48 hours
- persistent AF is where you have AF episodes that last more than seven days and it is unlikely that they will stop on their own. You may need treatment to restore your normal heart rhythm
- long-standing persistent AF means you have had continuous atrial fibrillation for a year or longer
- permanent AF is there all the time. You might be diagnosed with permanent AF if you've had it for more than one year and treatment with cardioversion hasn't helped.

As well as these four types, a small number of people may be diagnosed with "lone" AF. This is when doctors cannot find what is causing your AF, or you don't have any risk factors for it.

Atrial flutter

Atrial flutter is a similar condition to AF and sometimes people have both at the same time. With atrial flutter, your upper heart chambers (atria) beat very fast, but regularly. Your heart may beat up to 150 times a minute and this can cause similar symptoms to AF, such as shortness of breath and fatigue. Atrial flutter can be caused by the same conditions that can cause AF. Similar tests and treatments for AF are also used for atrial flutter. Like AF, atrial flutter also increases your risk of stroke.

How is AF diagnosed?

AF can be detected by a healthcare professional checking your pulse. If your pulse feels very fast and/or irregular, they may refer you for further tests to confirm whether you have AF, and if so, what type you have. These tests may include the following:

- an electrocardiogram (ECG) tests the electrical activity of your heart. It's painless and usually takes less than 10 minutes. It may be done by your GP or in hospital
- an echocardiogram uses sound waves to check your heart's structure and how it's working
- blood tests check for conditions that can cause AF like an overactive thyroid gland, anaemia, or any problems with your kidney function
- a chest X-ray will check whether a lung problem could have caused your AF.

AF that comes and goes can be hard to detect. To help diagnose it, you may be asked to wear a portable ECG monitor for 24 hours or more to check how your heart works over a longer period of time.

How is AF treated?

If you have AF, you will usually need treatment to control the condition as well as treatment to reduce your risk of stroke.

Regulating your heart rhythm

To treat your heart rhythm you may be prescribed anti-arrhythmic drugs. These drugs help your heart to beat more regularly. There are different types and they work in different ways. Beta-blockers are one example. Your doctor will talk to you about which treatment will be best for you.

Cardioversion is a treatment that uses medication or a brief electrical shock (sometimes both), to help your heart return to its normal rhythm. It is more likely to work if you have not had AF for very long. There is a risk however that your AF will return.

Regulating your heart rate

If your heart rhythm cannot be brought back to normal with cardioversion or medication, or these treatments are unsuitable, you will usually be given medication to control your heart rate. This means your heart will beat slower, even though it may still be irregular.

The aim of this type of treatment is to help your heart to work more effectively. Some types of medication used to regulate your heart rate are the same ones as those used to control your heart rhythm, for example beta blockers.

You may need to try several types of medication before you find the right one for you. Speak to your doctor if you have any

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side effects. You should also have regular check-ups to check your blood pressure and your heart rate.

Other treatments

There are other treatments for AF, including specific surgical procedures such as catheter ablation, where radiofrequency energy is used to remove the area of the heart causing the abnormal rhythm. For more information about these other treatments, contact the Atrial Fibrillation Association. See *Other sources of help and information* for details.

Treatments to reduce your risk of stroke

As well as treatment for your AF, you may also need treatment to reduce your risk of stroke.

The CHA₂DS₂-VASc scale

If you have AF your risk of stroke is usually assessed using a scoring system called CHA₂DS₂-VASc. Using this scale (below), you are given points depending on whether or not you have each of the different factors.

Factor	Score
Congestive heart failure	1
High blood pressure	1
Age – if you are over 75	2
– if you are 65–74	1
Diabetes	1
Previous Stroke or TIA	2
Vascular disease	1
If you are female	1

If you have a score of two or more, your doctor will usually discuss the use of a blood-thinning (anticoagulant) medication to reduce your risk of stroke. If you are male and your score is one, your doctor may still wish to discuss the use of a blood-thinning medication. If your doctor feels you have a low risk then you will probably not need any blood-thinning treatment, as the risk of treatment will outweigh the benefits.

However, your risk of stroke changes with age and other medical problems and should be regularly reassessed to see if you need treatment to reduce your risk of stroke. And if you do start to take anticoagulants you should continue to be assessed at least once a year to make sure that your treatment is still suitable.

Anticoagulants

This guide can only give general information. You should always get individual advice about your own health and any treatment you may need from a medical professional such as a GP or pharmacist.

The main group of drugs used to reduce the risk of stroke in AF are anticoagulants. They increase the time it takes for your blood to form a clot. By taking an anticoagulant, your blood is less likely to clot and so your risk of stroke is reduced.

There are risks to taking anticoagulants. Because they make your blood less likely to clot there is a risk that they can cause excessive bleeding, particularly if you fall or hurt yourself. It can be very serious if there is bleeding in the brain, but this is very rare. In most people the benefits

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of taking anticoagulants outweigh the risks. Your doctor will assess your risk of bleeding before recommending you take anticoagulants and should talk through all the benefits and risks of the medication with you before you start to take it.

Warfarin is the most common type of anticoagulant medication that may be used to reduce your risk of stroke if you have AF. There are also other newer anticoagulants which work differently to warfarin, such as dabigatran etexilate, rivaroxaban, apixaban and edoxaban. All five of these drugs are administered orally. Heparin is an anticoagulant that is administered by injection.

Warfarin

Vitamin K plays an important role in the blood clotting process. It helps to produce a protein (called prothrombin), which helps your blood to clot.

Warfarin slows down the way vitamin K is made. This, in turn, slows down the making of the protein (prothrombin). This means it will take longer for blood clots to form. Warfarin is given in tablet form and the dose needs to be tailored to you individually. This is because people respond to warfarin differently and it is not easy to predict.

You need to have regular blood tests if you take warfarin. This is because warfarin changes how long it takes for your blood to clot. Regular tests will make sure your blood is not becoming too thin, which would increase the risk of excessive bleeding. The test checks how quickly your blood clots at a particular stage in the process and compares it to a normal sample. The result is called the international normalised ratio (INR).

INR is expressed as a value. A normal INR value for blood (when you are not taking anticoagulants) is around one. If you have AF and are on warfarin your blood should be two to three times thinner than normal, so an INR value of two to three is recommended. The lower your INR level, the more quickly your blood clots. The higher your INR, the longer it takes your blood to clot or the thinner your blood is.

You will need to attend an anticoagulation clinic weekly when you first start taking warfarin, as the dose will need to be adjusted to suit you. When it is stable, you will probably need to attend a clinic every six to eight weeks for blood tests.

When you are first prescribed warfarin you may receive a pack from your GP or hospital which contains a credit card-sized alert card, a yellow booklet called *Oral Anticoagulant Therapy*, and a record card. You can get an alert card from the Heart Rhythm Alliance website www.heartrhythmalliance.org. You should carry your alert card at all times in case of a medical emergency.

Your dentist will need to see a recent INR result before carrying out any treatment. If you are travelling, make sure you have enough medication for your whole trip and take your alert card with you.

Self-monitoring

It is possible to monitor your own INR with a machine you can keep at home. Your GP can provide you with test strips to use, but you would have to buy the machine yourself. These cost about £300 and some companies will let you spread the payments over one or two years.

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Research shows that self-monitoring may be more beneficial than having your INR tested at a clinic, but it is not suitable for everyone. About half of all people taking warfarin are able to do these blood tests at home.

You would need some initial training on how to test your own INR levels. You would have to arrange with your clinic what to do if your INR is outside the recommended range for you, and how you can contact them if necessary.

Warfarin and food

If you are taking warfarin, you need to be mindful of the foods you eat. Certain foods contain high levels of vitamin K. Too much vitamin K can affect how warfarin works.

Some foods that contain high levels of vitamin K include green leafy vegetables, broccoli, Brussels sprouts, liver, vegetable oil and cereals containing wheat bran and oats. If you take warfarin avoid drinking cranberry juice as it contains a lot of vitamin K.

Your warfarin dose is usually adjusted to compensate for the level of vitamin K in your diet. You should not make sudden changes to your usual diet, as this could affect your INR level.

If you want to change your diet you should consult a doctor and your anticoagulation clinic so you can be monitored more closely and your warfarin dose can be changed if necessary.

There are other things to consider when taking warfarin. Keep alcohol to a minimum as it makes your blood thinner and increases your risk of a serious bleed. Binge drinking is particularly dangerous.

Some medications and herbal remedies can interact with warfarin and can affect your INR levels. Always tell your doctor or pharmacist if you are on warfarin before taking any new medication, particularly antibiotics, antidepressants, aspirin, statins or ulcer medicines. Always check any medication you plan to take with your GP or pharmacist, and read the patient information leaflets. Avoid taking aspirin or ibuprofen unless prescribed by a professional, although it is safe to take paracetamol at the recommended dose.

Warfarin is not suitable for everyone and should not be taken if you have very high blood pressure (severe hypertension), peptic ulcers or haemophilia. It should also be avoided if you are pregnant.

The main side effect of warfarin is bleeding. Anyone experiencing unusual bleeding should seek medical attention urgently. If you have any signs of a stroke, call **999**.

Other types of anticoagulant

Bleeding and anticoagulants

Like warfarin, the anticoagulants listed here carry a small risk of bleeding. This means you have a slightly higher risk of having a haemorrhagic stroke (bleeding in or around the brain). So if you have any stroke symptoms, always call **999**.

Dabigatran etexilate (Pradaxa)

Dabigatran etexilate attaches itself to a protein (called thrombin) in your blood, making your blood less likely to form a clot. You should take dabigatran etexilate exactly as your doctor prescribes.

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If you take dabigatran etexilate, you do not need to have regular blood tests, as it works in a different way to warfarin. However, you may need to have occasional blood tests. Your doctor will tell you when these tests should take place. Dabigatran etexilate is not usually prescribed if you are pregnant or breastfeeding.

Some types of medication can interact with dabigatran etexilate, however check with your doctor whether it is safe to take any other prescribed or herbal remedies, such as anti-inflammatory medication or St John's Wort. Aspirin and ibuprofen should not be taken with dabigatran etexilate.

Side effects of dabigatran etexilate include bleeding, diarrhoea, indigestion, nausea and stomach pain. You should seek urgent medical attention if you experience any unusual bleeding.

If you are having an operation or dental treatment, ensure the medical professionals are aware that you are taking dabigatran etexilate.

Rivaroxaban (Xarelto)

Rivaroxaban makes the blood less likely to clot by blocking a protein (Factor Xa) in the blood. This protein plays a key role in the blood clotting process. Like with dabigatran etexilate, it works in a different way to warfarin so you will not have to have regular blood tests. Rivaroxaban should be taken exactly as prescribed by your doctor. If you have kidney problems, you will usually be given a reduced dose.

Rivaroxaban is not usually recommended to be used if you are pregnant or breastfeeding. Ask your doctor whether it is safe to take Rivaroxaban with any other prescribed

medicines or herbal remedies you may be taking.

Side effects of rivaroxaban include bleeding, constipation, diarrhoea, dizziness and fainting. You should seek urgent medical attention if you experience any unusual bleeding, high temperature or rash.

Apixaban (Eliquis)

Similar to rivaroxaban, apixaban makes the blood less likely to clot by blocking a protein (Factor Xa) in the blood. This protein plays a key role in the blood clotting process. Like the other alternatives to warfarin, you will not need to have regular blood tests.

Apixaban can be taken with or without food. If you have kidney problems, you will usually be given a reduced dose.

Apixaban is not usually recommended if you are pregnant or breastfeeding. If you are taking any other prescribed medicines, or herbal remedies, please check with your doctor whether it is safe to continue doing so.

The main side effects of apixaban are bleeding and anaemia. Seek urgent medical attention if you experience any unusual bleeding.

Edoxaban (Lixiana)

Edoxaban is the most recent anticoagulant available to reduce risk of stroke. Like apixaban and rivaroxaban, it makes the blood less likely to clot by blocking a blood protein called Factor Xa. This protein is a key part in the blood clotting process. Like the other alternatives to warfarin, if you are taking edoxaban you will not need to have regular blood tests.

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Edoxaban is taken once a day, either with or without food. The drug is not used if you are pregnant or breastfeeding. It can interact with other medicines, although always check with your doctor whether it is safe to continue taking other prescribed medicines or herbal remedies.

The main side effect of edoxaban is bleeding, but patients may also experience nausea, or itchiness. Seek urgent medical attention if you experience any unusual bleeding.

Which anticoagulant medication should I take?

The most commonly prescribed anticoagulant is warfarin, but it does require careful monitoring. The advantage of other anticoagulants (dabigatran etexilate, rivaroxaban, apixaban and edoxaban) is that their effect on your blood is more stable and they are not affected by any foods that you eat, so they do not need to be monitored as carefully. Your doctor should talk to you about all the available treatment options, along with their risks and benefits. You should then decide together which one would be the most suitable for you.

Care AF is an online resource that can help you understand atrial fibrillation and reduce your risk of a stroke. Visit www.careaf.org.

What else do I need to know?

Please note that we have not provided an exhaustive list of side effects and drug interactions in this guide. Always refer to the patient information leaflet that comes with your medication for a full list.

Never stop taking your medication if you feel unwell. Always contact your GP for advice – stopping medication suddenly can be dangerous. In a medical emergency, always call **999**.

If you are taking anticoagulants, you must always check any medication you plan to take with your GP or pharmacist before taking it. You should also read the patient information leaflets that come with your medication.

You should be given a patient alert card before you start taking an anticoagulant. Always carry your alert card with you in case of an emergency. You should also tell your dentist you are taking anticoagulant medication before you have any treatment.

Anticoagulants and medical procedures

If you need a medical procedure, your anticoagulant medication may need to be stopped beforehand. Make sure that the healthcare professionals treating you are aware of your medication. If you are taking warfarin you may be given an alternative medication such as heparin until you can take warfarin again. This decision should be made with your doctor and by looking at the potential risks of having the procedure and stopping your medication.

If you need an emergency operation, and you are taking an anticoagulant, you may need treatment beforehand to reverse the effects of your anticoagulant so you don't bleed too much during the procedure.

If you have any concerns about the medication you are taking, make sure you discuss them with your doctor.

What else can I do to reduce my risk of stroke?

There are many things you can do to lower your chances of having a stroke. These include:

- managing any other medical conditions you have, for example high cholesterol or diabetes
- receiving treatment for high blood pressure
- stopping smoking
- limiting the amount of alcohol you drink
- following a healthy diet
- exercising regularly
- having regular check-ups with your GP.

Spotting the signs of a stroke

FAST test



Face

Can the person smile? Has their face fallen on one side?



Arms

Can the person raise both arms and keep them there?



Speech

Can the person speak clearly and understand what you say? Is their speech slurred?



Time

If you see any of these three signs, it's time to call **999**.

The FAST test helps to spot the three most common symptoms of stroke. But there are other signs that you should always take seriously. These include:

- sudden weakness or numbness on one side of the body, including legs, hands or feet
- difficulty finding words or speaking in clear sentences
- sudden blurred vision or loss of sight in one or both eyes
- sudden memory loss or confusion, and dizziness or a sudden fall
- a sudden, severe headache.

Stroke can happen to anyone, at any age. Every second counts. If you spot any of these signs of a stroke, don't wait. Call **999** straight away.

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A transient ischaemic attack or TIA is the same as a stroke but the symptoms last for a short amount of time. In a TIA, a blood vessel in the brain gets blocked, but the blockage clears by itself. A TIA is a major warning sign of a stroke and if you spot any signs of stroke or TIA you should call **999**.

Where to get help and information

From the Stroke Association

Talk to us

Our Stroke Helpline is for anyone affected by a stroke, including family, friends and carers. The Helpline can give you information and support on any aspect of stroke.

Call us on **0303 3033 100**, from a textphone **18001 0303 3033 100** or email info@stroke.org.uk.

Read our publications

We publish detailed information about a wide range of stroke topics including reducing your risk of a stroke and rehabilitation. Read online at stroke.org.uk or call the Helpline to ask for printed copies.

My Stroke Guide

My Stroke Guide is the online stroke support tool from the Stroke Association. Log on to find easy-to-read information, advice and videos about stroke. And our chat forums can connect you to our online community, to hear how others manage their recovery. Log on at mystrokeguide.com.

Our dedicated Enquiry Line is on hand to support you with using My Stroke Guide. Call **0300 222 5707** or email mystrokeguide@stroke.org.uk.

Other sources of help and information

Anticoagulation Europe

Website: www.anticoagulationeurope.org

Tel: 020 8289 6875

They provide information and support for people on anticoagulant medications.

Arrhythmia Alliance

Website: www.heartrhythmalliance.org.uk

Helpline: 01789 867 501

They support people with all types of heart arrhythmias.

Atrial Fibrillation Association

Website: www.heartrhythmalliance.org

Tel: 01789 867 502

They support people with AF, offering a range of leaflets on AF, treatments and types of medication, plus details of AF specialists.

British Heart Foundation

Website: www.bhf.org.uk

Heart Helpline: 0300 330 3311

They provide information and support on heart issues, including AF and warfarin.

NHS Choices

Website: www.nhs.uk

Provides information about atrial fibrillation and the anticoagulant medications used to treat it.

Glossary

Anticoagulant = a type of blood-thinning medication

Apixaban (Eliquis) = an anticoagulant medication used to reduce the risk of stroke in people with AF

Atrial flutter = a condition similar to AF, with a fast but regular heartbeat

Cardiologist = a heart specialist

Cardioversion = a procedure that returns the heart rate to normal

Catheter ablation = removal of tissue via a catheter, using an electrical current

Congestive heart failure = when your heart doesn't pump blood around your body as well as it should

Dabigatran etexilate (Pradaxa) = an anticoagulant medication used to reduce the risk of stroke in people with AF

ECG = electrocardiogram. A test to measure the electrical activity of your heart

Echocardiogram = a test using sound waves to check the structure and function of your heart

Edoxaban (Lixiana) = an anticoagulant medication used to reduce the risk of stroke in people with AF

Electrophysiologist = a heart specialist that carries out some treatments including catheter ablation

Heparin = an anticoagulant medication administered by injection

INR = international normalised ratio. This is a measure of how quickly your blood clots

Rivaroxiban (Xarelto) = an anticoagulant medication used to reduce the risk of stroke in people with AF

Vascular disease = a wide-ranging term that includes diseases of arteries; veins; and the rest of the body's vasculature system. It can happen when parts of the vasculature system become 'furred up' with fatty deposits, making them more likely to become blocked

Warfarin = an anticoagulant medication commonly used to reduce the risk of stroke in people with AF

About our information

We want to provide the best information for people affected by stroke. That's why we ask stroke survivors and their families, as well as medical experts, to help us put our publications together.

How did we do?

To tell us what you think of this guide, or to request a list of the sources we used to create it, email us at feedback@stroke.org.uk.

Accessible formats

Visit our website if you need this information in audio, large print or braille.

Always get individual advice

Please be aware that this information is not intended as a substitute for specialist professional advice tailored to your situation. We strive to ensure that the content we provide is accurate and up-to-date, but information can change over time. So far as is permitted by law, the Stroke Association does not accept any liability in relation to the use of the information in this publication, or any third-party information or websites included or referred to.

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Together we can conquer stroke.

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