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 factsheet explains what atrial fibrillation is and how it is treated. 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.

The FAST test (right) can help you to recognise the symptoms of a stroke. These symptoms usually come on suddenly. Other symptoms include sudden weakness or numbness on one side of the body, sudden confusion, dizziness or unsteadiness.

A transient ischaemic attack or TIA is similar to a stroke but the symptoms are temporary – usually lasting from a few minutes up to 24 hours. A TIA is serious and should not be ignored. If you experience any of the symptoms described above you must call 999, as there is no way of telling whether you are having a TIA or a stroke when the symptoms first start.

What is atrial fibrillation (AF)?

Atrial fibrillation is the most common type of irregular heartbeat. There are over one million people with AF in the UK and it is more common in older people. Atrial fibrillation increases your risk of stroke by five times. 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.
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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.

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. Your heart may beat up to 140 times a minute if you have AF.

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 and pool 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 and AF is often only diagnosed during a general medical check-up.

There are three types of AF. They 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 will need treatment to restore your normal heart rhythm.
- **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 (see page four) hasn’t helped.
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As well as these three 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 cause AF. The tests and treatments for AF are also used for atrial flutter. 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, such as 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.

You may be referred to a heart specialist called a cardiologist. They can help you decide what types of medication are right for you and monitor them. They can also perform some procedures to treat AF, including cardioversion (see page four).

You may also be referred to an electrophysiologist who offers another type of treatment called catheter ablation. Many hospitals now have arrhythmia nurse specialists who can offer you and your family information about your treatment.

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.

Controlling AF may involve:

- treating your heart rhythm to make it more regular
- treating your heart rate to slow it down.

The treatment you will have will depend on many different factors, including the type of AF you have, how long you have had the condition, whether you have any other medical conditions and whether you have been treated for AF in the past.
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Treating 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 may 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.

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 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. For more information about other treatments, contact the Atrial Fibrillation Association. See Other useful organisations 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 technique called CHA2DS2-VASc. Using this scale (below), you are given points depending on whether or not you have different factors.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive heart failure</td>
<td>1</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>1</td>
</tr>
<tr>
<td>Age – if you are over 75</td>
<td>2</td>
</tr>
<tr>
<td>Age – if you are 65 – 74</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1</td>
</tr>
<tr>
<td>Previous Stroke or TIA</td>
<td>2</td>
</tr>
<tr>
<td>Vascular disease</td>
<td>1</td>
</tr>
<tr>
<td>If you are female</td>
<td>1</td>
</tr>
</tbody>
</table>

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 be offered any 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.
**Atrial fibrillation (AF) and stroke**

**Anticoagulants**
The main group of drugs used to treat AF are anticoagulants. They increase the time it takes for your blood to form a clot. They do this by stopping certain proteins, which help your blood to clot, from forming. **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 if you fall or hurt yourself.

However, in most people the benefits of taking anticoagulants outweigh this risk. 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 new anticoagulants which work differently to warfarin such as dabigatran, rivaroxaban and apixaban.

**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 as there may be a risk of bleeding. The test checks how quickly your blood clots at a particular stage in the process and compares it to 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 aimed for. 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 should 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 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.
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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.

Research shows that self-monitoring may be more beneficial than having your INR tested at a clinic, however 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, mature cheese, blue cheese, egg yolks, chick peas, liver, olive oil and cereals containing wheat bran and oats. If you take warfarin avoid drinking cranberry juice as it contains a lot of vitamin K.

Soya bean products, avocados and large amounts of ice cream have also been reported to have an effect on how well warfarin works.

Your warfarin dose is usually adjusted to compensate for the level of vitamin K in your diet. So 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.

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 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.

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

Minor side effects of warfarin include rashes, nausea, vomiting and diarrhoea. The main side effect of warfarin is bleeding. Anyone experiencing bleeding should seek medical attention and have an urgent blood test.
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**Dabigatran etexilate (Pradaxa)**
Dabigatran etexilate attaches itself to a protein (called thrombin) in your blood, making your blood less likely to form a clot. It is given as a tablet, usually prescribed at a dose of 150mg or 110mg. It is taken twice a day with or without food. The dose you are given will usually stay the same.

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 to make sure your kidneys are working well. 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**, in particular certain antibiotics, anti-arrhythmic drugs, anticonvulsants, anti-platelets, anti-inflammatory medication and herbal remedies such as St John’s Wort.

Side effects of dabigatran etexilate include bleeding, diarrhoea, indigestion, nausea and stomach pain. You should **seek urgent medical attention** if you have severe or uncontrollable bleeding, unusual bruising, unexpected pain, or headaches accompanied by dizziness or weakness.

**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. Rivaroxaban is usually prescribed at a dose of 20mg and must be taken with food. If you have kidney problems, you will usually be given a reduced dose of 15mg. It is advisable to take it at the same time each day.

Rivaroxaban is not usually recommended if you are pregnant or breastfeeding. It also **interacts with other types of medication** such as antifungal agents, anticonvulsants, heparin, anti-inflammatory medication, medicines that affect blood clotting and herbal remedies such as St John’s Wort.

Side effects of rivaroxaban include bleeding, constipation, diarrhoea, dizziness and fainting. You should **seek medical attention** if you notice any of the following symptoms: unexplained dizziness or weakness; swelling and discomfort; a sudden, severe, headache; unusual bruising; nosebleeds; bleeding gums, or cuts that take a long time to heal.

**Apixaban (Eliquis)**
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. Apixaban is usually prescribed at a dose of 5mg, twice a day. It can be taken with or without food. If you have kidney problems, you will usually be given a reduced dose of 2.5mg. It is advisable to take this medication at the same time each day.

Apixaban is not usually recommended if you are pregnant or breastfeeding. It also **interacts with other types of medication** such as antifungal agents, anticonvulsants, anti-inflammatory medication, medicines that affect blood clotting and herbal remedies such as St John’s Wort.

The main side effect of apixaban is **bleeding**. **Seek medical attention** if you notice any of the following symptoms: swelling of the face, mouth, lips or tongue or difficulty breathing.
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.

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, rivaroxaban and apixaban) 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.

The NHS has produced an online tool to help you think about which is the best option for you. You can find this Decision Aid at: sdm.rightcare.nhs.uk/pda/stroke-prevention-for-atrial-fibrillation

care AF is another online resource that can help you make a decision. It provides lots of information about AF and the different ways of treating it. Visit www.careaf.org

Anticoagulants and medical procedures

If you need a medical procedure, your anticoagulant medication may need to be stopped beforehand. 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 do I need to know?

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

Tell your doctor about any new medication you are taking. Your pharmacist may also be able to give you advice about your medication.

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.
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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:
• stop smoking
• limit the amount of alcohol you drink
• follow a healthy diet
• exercise regularly
• have regular check-ups with your GP
• manage any other medical conditions you have, for example high cholesterol, diabetes and high blood pressure.

We have lots of information that can help you to reduce your risk of stroke.

How can I find out more?

Talk to us
At the Stroke Association, our helpline team can give you information about stroke and tell you about services and support available in your local area.

Call us on 0303 3033 100 (Monday to Friday, 9am-5pm) or email info@stroke.org.uk

Get online
We have lots of information about stroke and how to prevent it on our website. Go to stroke.org.uk

Read our publications
We also produce a range of other leaflets and factsheets about stroke and related issues. You can download these for free or order a printed copy to be posted to you via our website stroke.org.uk or by calling the helpline on 0303 3033 100.

Some of our other factsheets include:
• High blood pressure and stroke (F06)
• Diabetes and stroke (F15)
• Smoking and the risk of stroke (F19)
• Alcohol and stroke (F13).

Go to stroke.org.uk for a full list.

Other useful contacts
If you’re looking for more information the following organisations may also be able to help. All are UK wide unless otherwise stated. Please note that details of these organisations are for information only. We are not recommending or endorsing anyone by including them in this factsheet.

Anticoagulation Europe
Website: www.anticoagulationeurope.org
Tel: 020 8289 6875
They provide information and support for people on anticoagulant medications.

Arrhythmia Alliance
Website: www.heartrhythmcharity.org.uk
Tel: 01789 867 501 (24 hour)
They support people with all types of heart arrhythmias.

Atrial Fibrillation Association
Website: www.atrialfibrillation.org.uk
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
Tel: 0300 330 3311
They provide information and support on heart issues, including AF and warfarin.
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Glossary of terms

**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

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

**Dabigatran etexelate** = 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 to check the structure and function of your heart

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

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

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

**Vascular disease** = weakening of your arteries and veins. This happens when they become ‘furred up’ with fatty deposits, making them less flexible and 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 are committed to producing clear, accurate and unbiased information for stroke survivors, their families and friends. To produce our publications we use information from professional bodies and other reliable sources including NICE, SIGN, Royal College of Physicians, medical journals and textbooks. For a list of all the sources used in this factsheet go to stroke.org.uk

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