

# Blood Thinning and Atrial Fibrillation

This factsheet is intended to provide patients affected by AF with information regarding the options for blood thinning in AF with an aim to help reduce their stroke risk.

## Introduction

Atrial fibrillation is a heart rhythm problem that makes the pulse irregular. This type of condition is called a 'cardiac arrhythmia'. Atrial fibrillation is the commonest cardiac arrhythmia. Although it can be identified in the young, it becomes more common with older age. It is thought that one in twelve people over 65 years have atrial fibrillation.

Atrial fibrillation can cause symptoms of palpitations, shortness of breath, chest discomfort, light headedness, fainting or fatigue. However, many patients have no symptoms.

If the atrial fibrillation has symptoms or not it raises an individual's risk of a stroke. A person suffering from atrial fibrillation has a one in three life-time risk of suffering a stroke.

The two goals of treatment of atrial fibrillation are to reduce a person's symptoms caused by the abnormal heart rhythm and to reduce the risk of a stroke.

## Stroke and atrial fibrillation

The heart has a natural rhythm; a pacemaker called the sinus node in the upper chamber of the heart stimulates this. This pacemaker triggers a smooth contraction of the heart. This contraction starts in the upper chamber (atrium) of the heart, forcing the blood smoothly into the lower pumping chamber (ventricle). While the ventricle is contracting the upper chamber relaxes to allow the returning blood to be stored for a moment until the lower chamber is ready to receive it.

In atrial fibrillation the contraction of the upper chamber becomes disorganised and does not contract smoothly. The atria appear to shake like

a jelly. In this situation the blood flow reduces in some areas. This is particularly a problem in a side chamber of the left atrium called the 'left atrial appendage'. When the blood stops moving it will tend to form clots. When clots have formed in the atrium there is a chance that they will move into the blood flow. When this happens they are carried in the circulation to smaller blood vessels of the brain. When an artery in the brain becomes blocked by a clot, the part of the brain the artery supplies loses its blood supply. This is the cause of a stroke, and strokes are often severe in AF.

## Blood clotting

The clotting of the blood is a complex process. This is so that the blood clots rapidly when required but remains fluid at other times. The process is often referred to as the 'clotting cascade' by clinicians. This term is used to explain how the stimulation to form a clot triggers a series of steps before producing the blood enzyme thrombin. The enzyme thrombin changes the soluble protein fibrinogen to the insoluble protein fibrin. Clots are made of fibrin.

A second clotting system is also active. This involves small cells found in the circulation called platelets. When platelets are triggered to heal a leak in the circulation they become tacky and stick together. As they stick together they trigger yet more platelets to become active and stick together. In this way they form a clot.

## Stroke prevention

There are three ways to reduce the risk of stroke in atrial fibrillation.

**The 'clotting cascade':** Medication can affect various points of the clotting cascade. In doing this the risk of clot formation is reduced. Medications that affect the clotting cascade are called anticoagulants. The best known medication in this area is warfarin (see the AF-A patient information sheet, Warfarin therapy). People on



anticoagulants are more at risk of bleeding but less at risk of clot related strokes.

**Reduce platelet stickiness:** To prevent platelet clots medication can be used to reduce their trigger and make them harder to stimulate. In this way they reduce clot formation. The main medications in this area are aspirin and clopidogrel. Sometimes, these medications may be used together. They are less effective than anticoagulants in preventing stroke.

**Left atrial appendage:** The side chamber of the left atrium is a common area for the blood flow to be reduced with a risk of clots forming. This area can be blocked off or in extreme cases removed to reduce the risk of clots forming here. This option is usually in people who cannot take or cannot tolerate medication with warfarin or other anticoagulants.

### Who requires treatment?

The treatments used to reduce the risk of stroke can also cause bleeding problems. It is important to judge when the benefit of medication is greater than the risk.

If risk of stroke is very low, no antithrombotic therapy is recommended. People with a low stroke risk may be advised to take an

anticoagulant or no therapy, while people with a moderate or high risk of stroke should be considered for anticoagulants.

### Personal stroke risk

By following large groups of people with AF and seeing who develops stroke, it has become possible to identify certain factors that increase the risk of stroke. These have been made into scoring systems such as the CHA<sub>2</sub>DS<sub>2</sub>VASc score shown in the table below. It should be noted that the risk of stroke is the same if AF is present all the time, or if AF comes and goes (paroxysmal AF).

Your annual risk of stroke rises from under 1% a year with a score of zero to over 10% a year for a score of over five. Most experts who have looked at this scoring scheme would suggest that the tipping point for your benefits on taking anticoagulation medication over its risks, is at a score of one or above. You can calculate your own risk using the calculator below. If your score is two or higher, your risk of stroke will justify anticoagulation. A score of 0 indicates very low risk, and requires no antithrombotic therapy, while a score of 1 could lead to a recommendation for either anticoagulant or no therapy. Your doctor will discuss your score and risk of stroke to help you reach a decision on anticoagulation.

### Assess your personal risk score (CHA<sub>2</sub>DS<sub>2</sub>VASc)

Question	Points	Your Score
Are you over 75?	2	
Are you over 65-74?	1	
Are you over 65 and female?	1	
Do you have high blood pressure?	1	
Do you have Diabetes?	1	
Do you have heart failure?	1	
Have you suffered a heart attack or have circulation problems including problems with the aorta*?	1	
Have you suffered a stroke (even a mild stroke)?	2	
<b>Total</b>	—	

\*The aorta is the large blood vessel in the abdomen that can become 'dilated' or swollen forming what is called an 'aneurysm'.



**AF-A Australia Medical Advisory Committee:** Dr Michael Davis Professor Ben Freedman Dr Gerry Kaye

**Founder & CEO:** Mrs Trudie Lobban MBE **Deputy CEO:** Mrs Jo Jerome

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