



HEART &
STROKE
FOUNDATION



Canadian Cardiovascular Society

Leadership. Knowledge. Community.

YOUR COMPLETE GUIDE TO **ATRIAL FIBRILLATION**

UNDERSTANDING ATRIAL FIBRILLATION (AF)
(MODULE 1)

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YOU'VE JUST BEEN TOLD YOU HAVE AF OR ATRIAL FLUTTER! ALL YOU CAN THINK ABOUT IS THAT THERE IS SOMETHING WRONG WITH YOUR HEART!

AF is a chronic condition, which means that once you have had an AF episode, you will have it again at some point in the future. You can live a long, healthy life as long as the AF is well managed and any medical conditions that trigger or aggravate the AF are treated.

The picture below is an overview of the three modules and the focus of each.

Part of managing AF or atrial flutter is to understand the condition. Module 1 will teach you that.

OVERVIEW OF MANAGING AF

MODULE 1	AF Diagnosed What is it? Is it harmful?		Find and Treat Common Causes	
MODULE 2	Manage Arrhythmia Symptoms		Assess Stroke Risk (CHADS2)	
	Rate Control • Medicine • Procedures	Rhythm Control • Medicine • Procedures	Blood Thinner, Aspirin, or Nothing	
MODULE 3	Living Well with AF			
	What to Expect from Your AF Management Plan	Following a Healthy Lifestyle	Understanding Common Responses and Finding Support	Patient Stories

HOW DOES THE **HEART WORK?**

TO LEARN ABOUT AND UNDERSTAND AF, YOU NEED TO KNOW A LITTLE ABOUT THE HEART AND HOW IT WORKS.

The heart is a hollow, muscular organ about the size of a fist. It is just to the left of the middle of your chest, underneath the breast bone and rib cage.

The heart and all the body's blood vessels are part of the cardiovascular system. This system works in an organized way to pump blood throughout the body.

Electrical signals within the heart cause its squeezing action. This squeezing makes blood flow through the body to send oxygen and nutrients to organs, muscles, nerves, and other tissues. The heart itself also needs blood to survive. The blood is supplied by vessels called the coronary arteries.

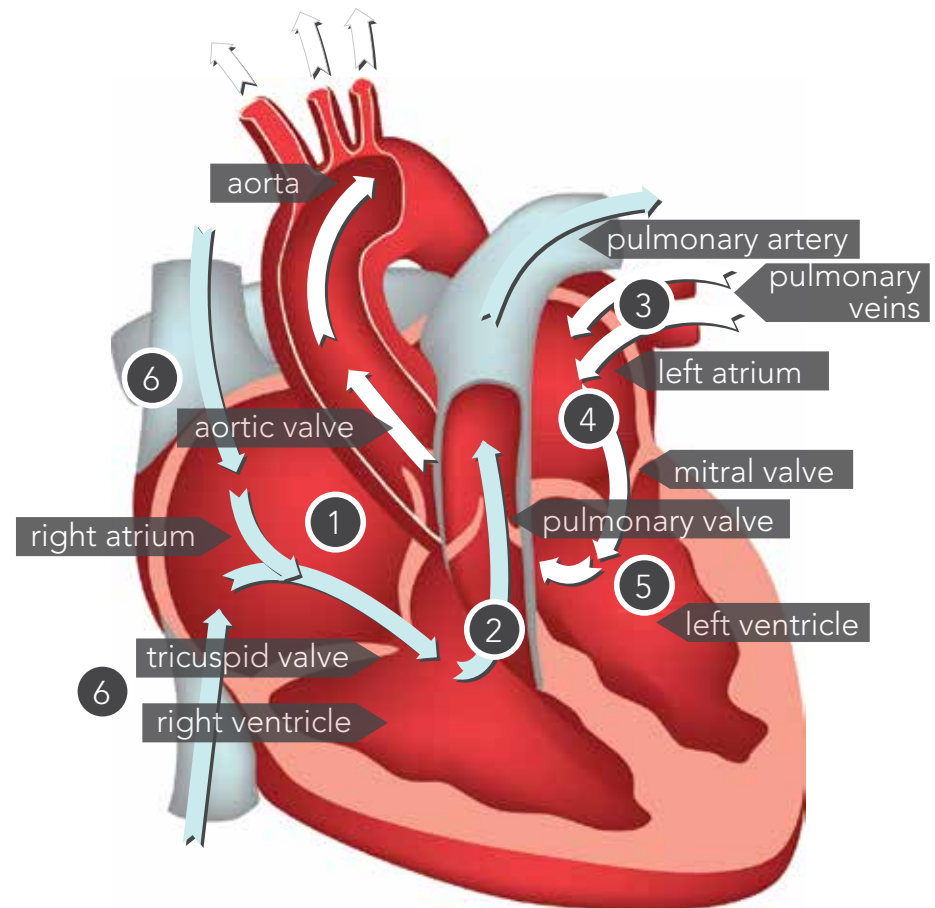
BLOOD CIRCULATION

The heart has two upper chambers: the right and left atrium (together called the atria). It also has two lower chambers: the right and left ventricle. These four chambers work together to do the "squeeze and relax" movement with which the heart pumps. The ventricles pump blood out of the heart, while the atria collect the blood that has already travelled through the body.

HOW YOUR BLOOD FLOWS

Here is how your blood flows, starting with the blood that has returned to the heart.

1. Blood travels from the right atrium, through the tricuspid valve, and into the right ventricle.
2. The right ventricle pumps the blood through the pulmonary valve and into the lungs.
3. In the lungs, oxygen is added to the blood and carbon dioxide is removed. The blood then travels through the pulmonary veins and into the left atrium.
4. From the left atrium, the oxygenated blood passes through the mitral valve and into the left ventricle.
5. The left ventricle pumps blood through the aortic valve into the aorta, which is the main supply route to the rest of the body.
6. "Used" (unoxxygenated) blood returns to the right atrium of the heart.



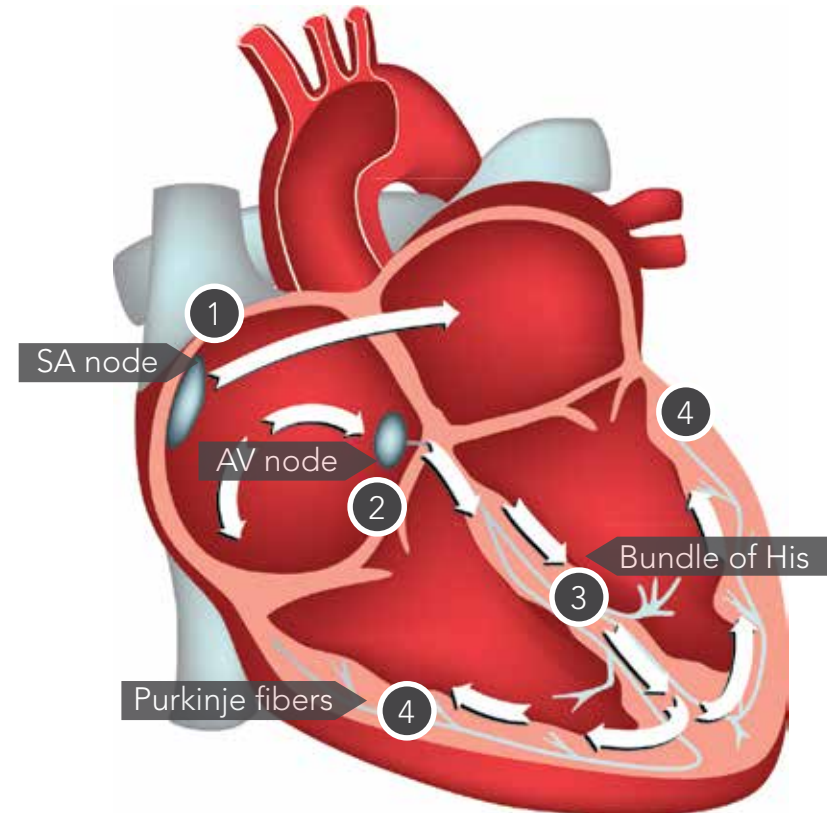
This cycle repeats with every heart beat.

ELECTRICAL CONDUCTION SYSTEM

The pumping action of the heart creates the heart beat. It is triggered by electrical impulses, or signals, that travel from the top to the bottom of the heart. These impulses cause the heart muscles to contract (squeeze), pushing blood out of the heart to the rest of the body. The heart then relaxes, allowing more blood to enter before the next beat.

Electrical impulses normally begin at the **sinoatrial** (SA) node, the body's natural pacemaker. Here is how electrical conduction works in a healthy heart:

1. The SA node sends a signal through the atria, causing them to contract and pump blood to the ventricles.
2. The electrical impulse travels down to the **atrioventricular** (AV) node, which is between the atria and the ventricles.
3. The AV node slows the signals and then sends them through conduction pathways called the Bundle of His, bundle branches, and Purkinje fibers.
4. Through these pathways, the electrical signals stimulate the ventricles, causing them to contract and pump the blood out. The ventricles' contracting is what makes the heart beat.



HEART RATE

The speed of the heart beat is called the heart rate. The heart rate is usually measured by counting the pulse rate. It is measured in **beats per minute** (bpm). The pattern of the heart beat is called the rhythm.

In a normal heart rhythm, the sinus node initiates 1 atrial beat for every 1 ventricular beat (1-to-1 electrical conduction). This is also called normal sinus rhythm.

Not everyone has the same heart rate. Normally, the resting heart rate is between 50 and 100 bpm and the rhythm is regular. At night, the heart beat can slow to below 50 bpm. With exercise, the heart beat can go higher than 100 bpm.

WHAT IS **AF?**

ARRHYTHMIA IS THE MEDICAL TERM FOR AN ABNORMAL HEART RHYTHM OR IRREGULAR HEART BEAT. THERE ARE MANY TYPES OF ARRHYTHMIAS.

AF is a common type of arrhythmia. AF is a chronic, progressive condition. In Canada, about 350,000 people have it. Even if the person doesn't feel the fast, irregular heart beat it's still serious because it can lead to other problems, such as stroke and heart failure.

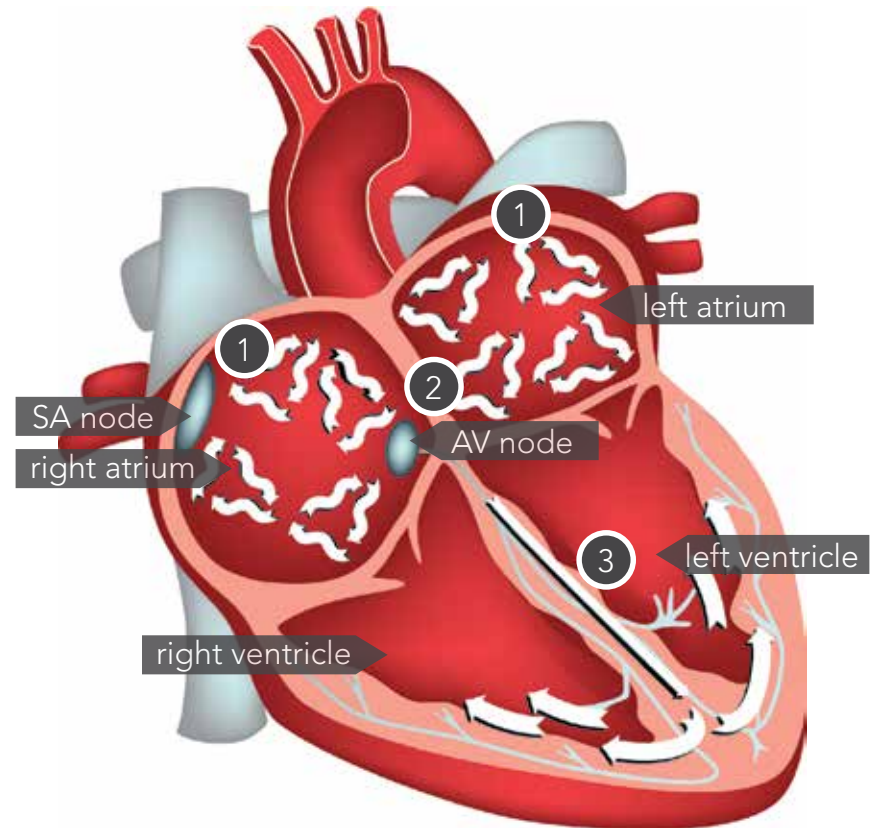
AF is caused by very fast and chaotic/disorganized electrical activity in the atria. This abnormal electrical activity causes the atria to quiver or shake. This movement is very fast (350 to 500 bpm) and irregular. The atria don't contract normally during AF.



There are other changes in the heart during AF:

1. AF is caused by very fast and chaotic/disorganized activity in the atria. The signals often start in the area around the pulmonary veins, instead of the SA node.
2. The fast and irregular electrical impulses in the atria still travel to the AV node; however, since the AV node blocks some electrical signals, not every impulse conducts downward to the ventricles.
3. The ventricles pump irregularly and often too fast (80 to 200 bpm).

AF affects everyone differently. One person with a fast heart rate may not feel well. Another person won't feel the AF at all. Over time, fast heart rates can cause the ventricles to become larger and weaker. Also, once AF starts, the atria undergo changes that make the AF more likely to continue. This process is called atrial remodelling. If AF continues for a long time (for example: 1 or 2 years) without being managed then some atria will become larger. Once the atria are too large, it can be hard to restore and maintain sinus rhythm.



FACT SHEET: NORMAL SINUS RHYTHM AND AF

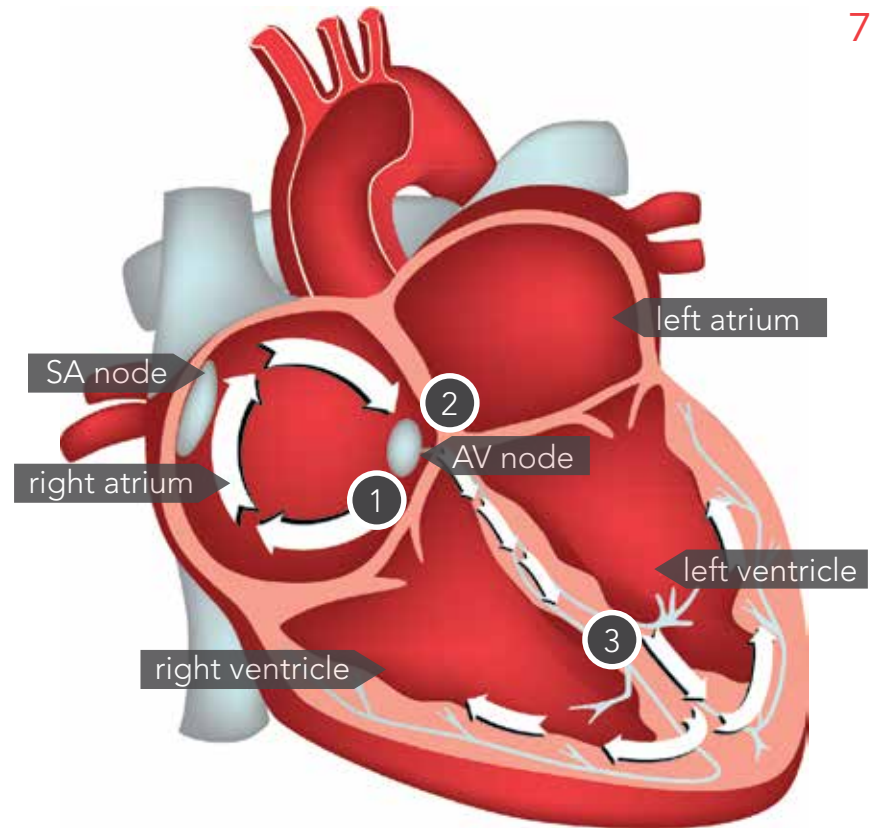
WHAT IS **ATRIAL FLUTTER**?

Atrial flutter is another type of arrhythmia. It is caused by very fast but regular electrical impulses that often start in the right atrium. The electrical impulses travel around and around in the atrium in an abnormal circular pattern ("circuit").

1. These fast electrical signals cause the atria to beat up to 300 bpm.
2. Only some of these fast impulses are sent from the atria to the ventricles. Without using medicine, the ventricles often beat at 150 bpm. In other words, there are 2 atrial beats for every 1 ventricular beat, or a 2-to-1 conduction.
3. Your pulse can be regular or irregular during atrial flutter—it depends on the pattern of conduction from the atria, through the AV node, and to the ventricles. Someone in atrial flutter can have a regular heart beat in one episode and an irregular heart beat in another.

Atrial flutter can be **typical** (most common) or **atypical**.

In **typical atrial flutter**, the electrical impulses circulate in the right atrium and in and around the tricuspid valve area.



In **atypical atrial flutter**, the impulses most often circulate in the left atrium. They can also circulate in a different part of the right atrium than the typical atrial flutter. Although it can start on its own, atypical flutter is most common in people who have had heart surgery or a procedure called ablation. Without medicine to control it, both types of atrial flutter cause the ventricles to beat very fast.

FACT SHEET: NORMAL SINUS RHYTHM
AND ATRIAL FLUTTER

HOW ARE AF AND ATRIAL FLUTTER THE SAME?

HOW ARE THEY DIFFERENT?

HOW THEY ARE THE SAME

- Both AF and atrial flutter happen in the atria and both cause the atria to beat very fast.
- Both AF and atrial flutter can lead to stroke or heart failure.
- Both are often treated with the same medicine.
- Both can be treated with an electric shock or a certain type of medicine that restores the normal heart rhythm (cardioversion).
- A person can have both conditions. Sometimes, atrial flutter develops into AF.

HOW THEY ARE DIFFERENT

- In AF there is no regular pattern to the electrical activity in the atria—it's disorganized. In atrial flutter the electrical activity is organized into a circuit in one of the atria and spreads in a regular pattern to the rest of the atria.
- When AF travels to the ventricles it always makes them beat irregularly. In atrial flutter the ventricles often beat in a regular pattern (at least for some of the time).

ATRIAL FIBRILLATION

ELECTRICAL ACTIVITY THROUGHOUT BOTH ATRIA IS CHAOTIC/DISORGANIZED.

THE MOST COMMON AREA THAT IT STARTS IN THE ATRIA IS AROUND THE PULMONARY VEINS, IN THE BACK WALL OF THE LEFT ATRIUM.

VERY FAST, DISORGANIZED IMPULSES CAUSE THE ATRIA TO QUIVER BETWEEN 350 AND 500 BPM.

THE VENTRICLES HAVE AN IRREGULAR BEATING PATTERN OF BETWEEN 80 TO 200 BPM.

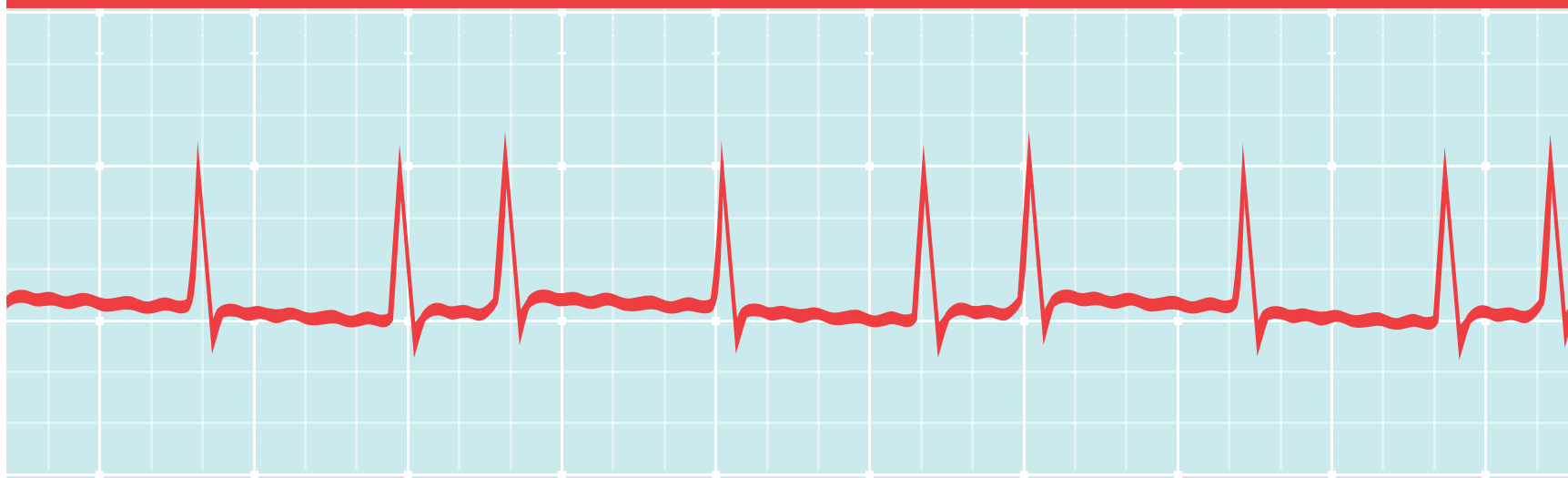
ATRIAL FLUTTER

ELECTRICAL IMPULSES CIRCULATE AROUND THE TRICUSPID VALVE AREA IN TYPICAL ATRIAL FLUTTER. IN ATYPICAL ATRIAL FLUTTER THE ELECTRICAL IMPULSES CIRCULATE IN OTHER AREAS OF THE ATRIUM, OFTEN THE LEFT ATRIUM, BUT CAN ALSO BE IN THE RIGHT ATRIUM.

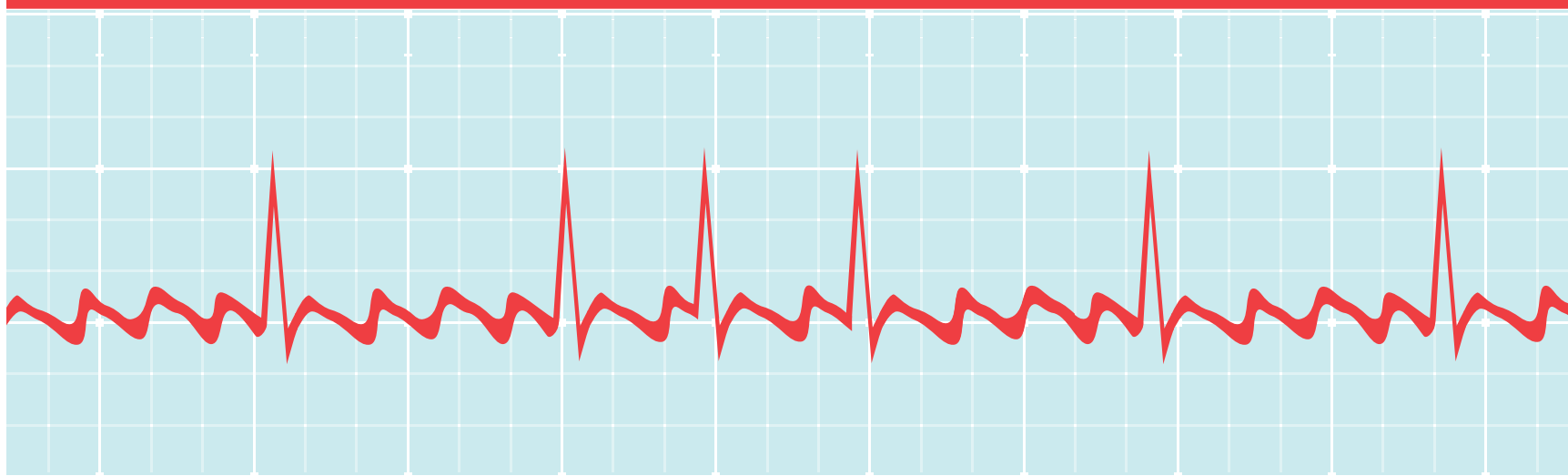
VERY FAST, CIRCULAR IMPULSES CAUSE THE ATRIA TO BEAT AROUND 300 BPM (BUT CAN BE ANYWHERE BETWEEN 280 AND 340 BPM).

REGULAR OR IRREGULAR BEATING PATTERN IN THE VENTRICLES; WHEN THE RATE IS A REGULAR PATTERN, THE VENTRICULAR RATE IS OFTEN HALF THE SPEED OF THE ATRIAL RATE. FOR EXAMPLE, IF THE ATRIAL RATE IS 300 BPM THE VENTRICULAR RATE WOULD USUALLY BE AROUND 150 BPM (2-TO-1 CONDUCTION).

ATRIAL FIBRILLATION



ATRIAL FLUTTER



WHAT ARE THE SYMPTOMS OF AF AND ATRIAL FLUTTER?

WITH BOTH AF AND ATRIAL FLUTTER, THE HEART IS PUMPING QUICKLY—AND IN SOME CASES—NOT AS WELL AS IT USUALLY DOES. THIS CAN CAUSE SYMPTOMS THAT AFFECT PEOPLE IN DIFFERENT WAYS.

Some common symptoms may include:

- palpitations or feeling like your heart is racing (beating very fast)
- feeling very tired/fatigued or having no energy
- an irregular heart beat or pulse rate
- feeling short of breath or weak with little physical effort
- chest discomfort
- feeling light-headed or dizzy
- sweating
- feeling anxious
- trouble concentrating

Less common symptoms include:

- nausea
- fainting or temporary loss of consciousness
- urinating more (passing water)

Everyone is different and should be treated based on what bothers them.

Some people have no symptoms (they are asymptomatic).

The condition may be first noted when a healthcare provider finds that the person's pulse or heart rate is irregular. Even if the person has no symptoms and the doctor suspects AF, it's important to have it investigated and treated.

After one episode of AF, some people may not have another for weeks, months, or years. However, even one episode means that they are at higher risk of having AF later on.

FACT SHEET: SYMPTOMS OF AF AND ATRIAL FLUTTER



ARE THERE DIFFERENT TYPES OF **AF?**

YES, THERE ARE DIFFERENT TYPES OF AF:

PAROXYSMAL describes AF episodes that start and stop by themselves. The episodes may come and go or they may last seconds, minutes, hours, or even days. Usually, an episode starts and stops suddenly on its own and lasts less than a week.

PERSISTENT describes AF that lasts longer than a week and doesn't stop on its own. This type of AF includes people treated with an electric shock (electrical cardioversion) or medicine (chemical/pharmacological cardioversion) to try to change the heart back to a normal sinus rhythm.

PERMANENT describes continuous, "accepted" AF that lasts longer than 1 year. Accepted means that it has been decided to keep the AF continuous, with no plans to convert back to normal sinus rhythm. There have usually been many unsuccessful attempts to restore and maintain normal heart rhythm (failed cardioversion). The term may also be used if the heart doctor (cardiologist) decides that there is no need to stop it or that it can't be stopped, even if the AF is newly discovered.

OTHER TERMS ARE SOMETIMES USED TO DESCRIBE THE PATTERNS OF AF:

SILENT describes having no noticeable symptoms during AF. It's still as serious as having AF with symptoms. People with silent AF feel well but still need follow-up, as they are at the same risk for stroke as people with symptoms.

NEWLY DISCOVERED (FIRST DETECTED) describes the first time that AF is recognized and diagnosed.

RECURRENT describes more than one AF episode.

LONG-STANDING PERSISTENT describes a continuous AF that lasts longer than 1 year.

LONE OR PRIMARY describes a person who has AF but has no known heart disease or cause that could be found. It's more common in younger adults.



WHO CAN DEVELOP AF?

AF is more common among older adults. However, AF with no known heart disease (lone or primary) is more common in people under 60 years.

- About 1 out of every 10 people over the age of 80 has AF.
- About 1 out of every 1000 people under the age of 50 has AF.

Because AF is more likely to happen as people get older, and people are living longer, it is expected that over the next few years there will be a big jump in the number of people who have AF.



COMMON CAUSES OF AF

Apart from age, certain conditions make people more likely to develop AF. These may be abnormalities of the heart (cardiac causes) or other medical conditions (non-cardiac causes).

CONDITIONS RELATED TO THE HEART

HIGH BLOOD PRESSURE can make a person prone to AF and other cardiovascular problems.

HEART VALVE DISEASE can be something you were born with, can be caused by an infection (such as rheumatic fever), or it can be caused by hardening and/or damage to the valves caused by aging.

CARDIOMYOPATHIES are diseases of the heart muscle that can lead to congestive heart failure (when the heart can't pump blood well enough to meet the body's needs).

LEFT VENTRICULAR DYSFUNCTION can happen when the heart's squeezing or relaxing functions are weak. These can develop after a heart attack, as a result of a very fast ventricular rate during an arrhythmia, or because the heart muscle isn't working as well as it should (cardiomyopathy).



CORONARY HEART DISEASE is the disease process where blockages develop in the arteries, which can lead to a heart attack, which then damages the heart muscle. It is an important factor in why arrhythmias develop. The damage starts when fatty deposits (plaque) build-up in the arteries. This build-up can narrow or block blood flow in the heart.

CONGENITAL HEART DEFECTS are heart problems you are born with. One example is an atrial septal defect (ASD), a hole between the upper chambers of the heart.

HEART SURGERY - AF is common after open heart surgery (for example, after valve surgery or coronary artery bypass grafting [CABG]). This may only be a problem early after the operation (post-operative AF). However, if someone had a heart operation, then their underlying condition (for example, valve disease or coronary disease) will often mean that they are at a higher risk of AF later on. Also, heart surgery that has caused scarring in the atria can lead to AF or atrial flutter long after the surgery.

MYOCARDITIS is the medical term for inflammation of the heart muscle.

PERICARDITIS is the medical term for inflammation of the sac that surrounds the heart.

SICK SINUS SYNDROME is when the SA node doesn't produce the electrical impulses properly. People with this syndrome often have very fast and slow heart beats (called tachycardia-bradycardia syndrome). They are also at more risk of developing AF.

SUPRAVENTRICULAR TACHYCARDIA (SVT) describes a regular, fast abnormal beat that starts in the upper chambers of the heart. Supraventricular means "above the ventricles" and tachycardia refers to heart rates above 100 bpm. SVT will sometimes trigger AF (especially in teens or those who had issues with a fast heart beat when they were younger).

CONDITIONS NOT RELATED TO THE HEART

SLEEP APNEA is a condition in which there are abnormal pauses in breathing or there is low breathing during sleep. It can happen when the airway becomes blocked during sleep in obese or overweight people, and sometimes because of a “glitch” in the nervous system that regulates sleep.

During the apnea episode, there is less oxygen in the blood. The heart responds to the body’s need for oxygen by making the heart beat faster, which makes AF more likely. People with obstructive sleep apnea often snore heavily, have non-restful sleep, and feel sleepy during the day.

OVERACTIVE THYROID GLAND (hyperthyroidism).

LUNG DISEASE such as emphysema/chronic obstructive pulmonary disease (COPD), asthma, pulmonary hypertension, and pulmonary embolism. These can cause the pressure in the pulmonary artery to go up and the right atrium to stretch.

HIGH VAGAL TONE is a condition that involves the vagus nerve. The vagus nerve is an important part of the autonomic nervous system. This system helps regulate body systems like the heart rate, blood pressure, digestion, and sleep. With high vagal tone, the heart rate is often very slow at night or at rest. The electrical properties of the atrial muscle are also changed, which make them more prone to fibrillate. This condition can predispose people who are very fit or athletic to AF, especially at night. This is because athletes normally have a slower heart rate.

VIRAL ILLNESS

NON-CARDIAC SURGERY – especially in people over 65, any type of surgery can trigger AF. When it happens after surgery, it increases the risk of other complications. This type of AF usually doesn’t last a long time and tends not to happen again.

OTHER FACTORS

There are other risk factors for AF that can be changed (modifiable) or can't be changed or controlled (non-modifiable)

CAN'T CHANGE

OVER 65 YEARS OLD

FAMILY HISTORY OF AF

BEING A MALE (MORE MEN THAN WOMEN DEVELOP AF)

CAN CHANGE

OBESITY

SLEEP APNEA

DRINKING TOO MUCH ALCOHOL

**STIMULANT DRUGS LIKE NICOTINE
(AND SOME ILLEGAL DRUGS)**

FACT SHEET: COMMON CAUSES OF AF

TRIGGERS

If you are at a higher risk for AF, one or more triggers can cause an episode. These triggers can include:

- exercising too hard
- drinking too much alcohol (sometimes called holiday heart syndrome)

These triggers **aren't a direct cause** of AF. The basic cause is heart disease or another condition that causes the atrium to remodel or causes electrical changes in the heart. However, triggers can bring on an episode of AF. If you know your triggers, try to avoid them.

Some people describe personal triggers. In other words, they have found that certain situations or things they eat or drink bring on an episode. These triggers have not been proven through research and don't apply to everyone with AF. Examples include:

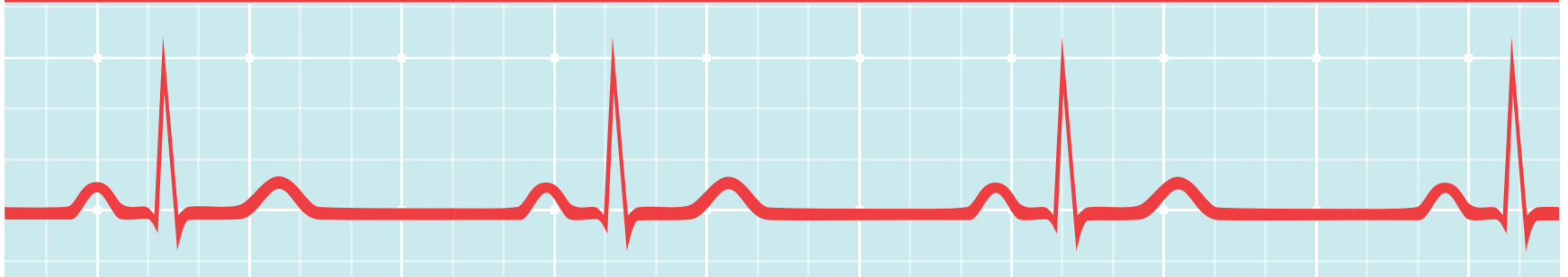
- a very stressful environment
- taking in more than 400 mg caffeine a day (three-8 oz. cups of brewed coffee)
- energy drinks
- dehydration
- nicotine or cigarettes
- MSG (monosodium glutamate)
- not getting enough sleep

HOW IS AF **DIAGNOSED?**

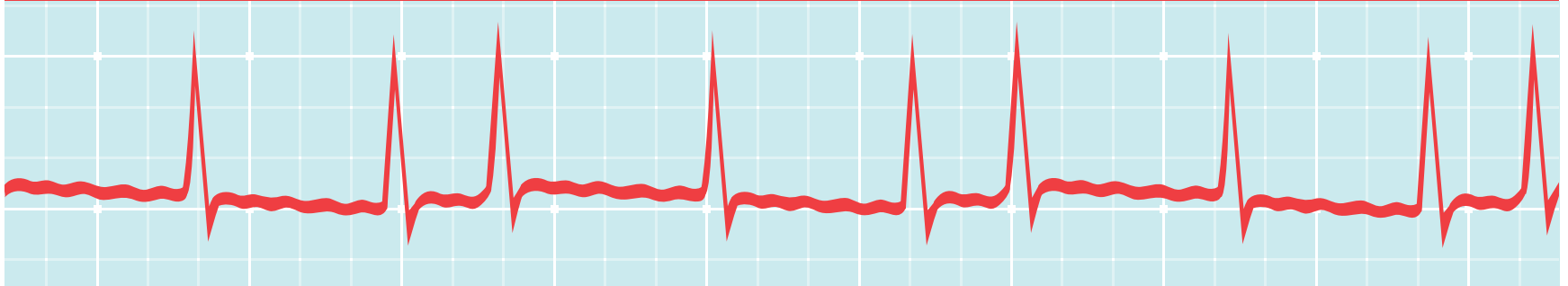
YOUR MEDICAL HISTORY WILL BE TAKEN AND ONE OR MORE TESTS WILL BE ORDERED. THE MOST COMMON TESTS ARE:

ELECTROCARDIOGRAM (ECG OR EKG) Electrodes or monitoring wires are attached to the chest. These electrodes make a short recording of your heart's electrical activity, usually while you are lying down. This recording, called a tracing, can help identify an arrhythmia.

NORMAL SINUS RHYTHM (ONE LEAD)



AF (ONE LEAD)



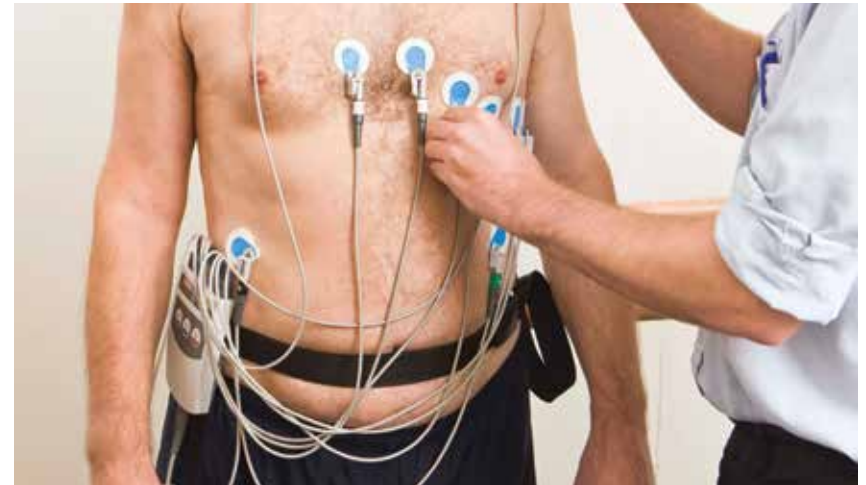
ECHOCARDIOGRAM This is an ultrasound image that shows the structure of and any abnormalities in the heart's chambers and valves and their movement. In a transthoracic echocardiogram, a hand-held probe is placed on the chest. Sound waves bounce off the heart and return to the machine (echo) to create an image. This test can find abnormalities of the chambers' size or function and problems with the valves.



BLOOD TESTS Blood tests may be done to check your thyroid hormones, potassium, calcium, magnesium, blood clotting factors, kidney function, liver function, iron level, and hemoglobin. If you take medicine, you may need to have a test to check the level of the medicine in your blood. These tests help find out what other reasons might be contributing to the AF and help assess your risk of a blood clot.



HOLTER MONITOR This is a device that you wear for 24 to 48 hours. It records the heart's electrical activity. The heart's rhythm and rate can be assessed while you do your usual activities. You may also be asked to make a note of any symptoms and the time they happened so that the symptoms can be matched with the heart activity the machine recorded. Advantages of a Holter monitor are that it can detect an AF episode with no symptoms and it can be of some help if the dose of your medicine has to be adjusted.



OTHER TESTS YOU MAY HAVE ARE:

EVENT MONITORING An event monitor (sometimes called a loop recorder) is a device used when AF symptoms don't happen often or don't last long. You keep a monitor for a week or two and activate it to record your heart rhythm only when you feel symptoms. Some event monitors can record the heart rhythm without you activating it. The tracings can be downloaded through a telephone line for a doctor to review.



TRANSESOPHAGEAL ECHOCARDIOGRAM (TEE) A

TEE is another way to do an echocardiogram. After you are sedated, a small ultrasound (echo) probe is passed down your food pipe (esophagus) and placed behind the left atrium of the heart. The images of the heart and valves are very clear, as there is less tissue for the echo waves to pass through than with a transthoracic echocardiogram.

This test is often used to check if there is a blood clot in the heart. Because you are given sedation, you usually have to stay in the hospital for a few hours after the test. For legal reasons, you must not drive a vehicle for 24 hours after the sedation. A TEE can be done in an emergency department, in the hospital, or as an outpatient procedure before cardioversion (re-setting the heart's rhythm).

STRESS TEST/TREADMILL TEST In this test, an ECG is done while you walk or jog on a treadmill. The test assesses the heart's electrical activity and blood pressure during exercise. Any ECG changes noted during exercise may be a sign of a problem with blood flow or a blockage in the vessel(s) around the heart.



FACT SHEET: COMMON TESTS TO DIAGNOSIS AF AND ATRIAL FLUTTER

MYOCARDIAL PERFUSION SCAN This test looks for blockages in the coronary arteries or to see how well blood flows to the heart. It has two parts. In the first part of the test, a tiny amount of radioactive tracer is injected into the bloodstream while you walk on a treadmill. The tracer “tags” highlight the red blood cells. As in a stress test, your heart rate and blood pressure are monitored continuously during exercise. If you can’t exercise for whatever reason, you may instead be given a medicine that speeds up your heart rate.

In the second part of the test, a camera records images of the heart muscle. These will show any areas that are damaged or that have a poor blood supply. A second set of pictures may be taken once the heart rate has slowed to a normal resting rate.

SLEEP STUDY This is a test to tell if you have sleep apnea, a condition that causes abnormal pauses in breathing or low breathing during sleep. Your sleep will be monitored with special machines in the clinic or lab. You will see a sleep specialist to talk about the results.

PACEMAKER OR IMPLANTABLE CARDIOVERTER DEFIBRILLATOR DATA If you already have a pacemaker or an ICD (implantable cardioverter defibrillator), information recorded by the device may help decide if you have had AF. Some devices will record how many events of AF you had and how long each one lasted. You would also be asked to make a note of times you had symptoms. The doctor can then see if these match up with the arrhythmia events the device recorded.

IMPLANTABLE LOOP RECORDER (ILR) In certain cases, an ILR may be used for people who don’t have AF very often. This small device is implanted under the skin on the front of the chest. It can record the heart’s activity for up to 3 years. Again, the person is asked to record any symptoms they have. The device can make automatic recordings of some abnormal heart rhythms or can be activated by pressing a button on another small device, which the person carries with them.

NOT EVERYONE NEEDS ALL THESE TESTS. IT DEPENDS ON YOUR MEDICAL HISTORY AND SYMPTOMS DURING AF. YOUR DOCTOR WILL DECIDE WHICH TESTS YOU NEED.

IS AF **HARMFUL OR DANGEROUS?**

AF IS **NOT** USUALLY A LIFE-THREATENING CONDITION. MANY PEOPLE WHO HAVE IT LIVE REGULAR, ACTIVE LIVES. HOWEVER, AF CAN LEAD TO SERIOUS PROBLEMS. THIS IS WHY IT'S IMPORTANT FOR PEOPLE WITH AF TO BE FOLLOWED BY A DOCTOR, SO THAT THEIR CONDITION CAN BE TREATED AND MONITORED.

The most important complications of AF are stroke, heart failure, and a decreased or poorer quality of life.

STROKE

Stroke is a serious complication. A stroke is a sudden lack of blood flow to the brain. It may be caused by a blood clot in a brain blood vessel (ischemic stroke) or bleeding from a vessel (hemorrhagic stroke). Depending on the area of brain that is damaged, a stroke can lead to serious and/or permanent problems such as loss of speech, movement, or vision.

About 15% of all strokes are due to AF. In about half of cases, the person will have some type of permanent disability.

People with AF have a higher risk of ischemic stroke. This is because when the atria beat in an abnormal way blood can pool and clot in these chambers. If a blood clot then breaks loose, it (or even small parts of it) can be pumped out of the heart and move into the brain or other parts of the body.

The risk of forming a blood clot and stroke can be reduced by medicine that “thins” the blood (anti-coagulants). The medicine used will depend on other risk factors for stroke that the person has. These stroke risk factors are:

- congestive heart failure
- high blood pressure
- being age 65 or older
- diabetes
- if you had a stroke or mini-stroke (TIA) before
- hardening of the arteries (atherosclerosis) and other vascular disease

HEART FAILURE

In this condition, the heart can't pump enough blood to meet the body's needs, either because it's weak or it can't contract fully. This can lead to congestion in the lungs and other tissues. Symptoms of heart failure include being short of breath, feeling tired, and swelling of the feet or legs.

If AF with a fast ventricular rate is left untreated for weeks or months, it can cause the heart muscle to weaken. This condition—tachycardia-induced cardiomyopathy—can sometimes lead to heart failure. Aggressive treatment (rhythm control therapy using anti-arrhythmics and or electrical cardioversion) is needed to prevent this type of heart failure.





CHANGE IN YOUR QUALITY OF LIFE

Some people with AF find that their symptoms prevent them from doing their usual activities or activities that they enjoy. Some people have to go to an emergency department or urgent care centre often, which also reduces their enjoyment of life. We call this having a lowered quality of life.

You **don't** have to go to the emergency department or see a doctor every time you have an AF episode: It should depend on your symptoms. For example, you don't have to go if your symptoms last less than 24 hours and you can still do your usual activities.

On the other hand, it's best to see a doctor or go to the emergency department if you can't do your usual activities and you are:

- dizzy, feel faint, weak, or unusually tired
- short of breath for several hours or have chest pain

AF affects everyone's quality of life differently. It's not always related to how often you have an episode or how long it lasts—it often depends on how serious the symptoms are. Many people with AF live a normal life. Managing the symptoms related to AF is an important part of living a normal life with AF.

The goal of AF therapy is to:

- decrease and relieve symptoms
- improve well-being
- reduce the need for/number of hospital visits
- reduce the risk of stroke

**FACT SHEET: IMPORTANT POINTS TO REMEMBER
ABOUT AF**

PUBLISHED: OCTOBER 2013



DISCLAIMER (CCS)

This educational material was developed by Canadian atrial fibrillation experts through consideration of medical literature and clinical experience. These modules provide reasonable and practical information for patients and their families and can be subject to change as medical knowledge and as practice patterns evolve. They are not intended to be a substitute for clinical care or consultation with a physician.

DISCLAIMER (HSF)

This publication **Your Complete Guide to Atrial Fibrillation** is for informational purposes only and is not intended to be considered or relied upon as medical advice or a substitute for medical advice, a medical diagnosis or treatment from a physician or qualified healthcare professional. You are responsible for obtaining appropriate medical advice from a physician or other qualified healthcare professional prior to acting upon any information available through this publication.

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GLOSSARY

Ablation – A procedure in which a small portion of heart tissue is destroyed using heat (radiofrequency ablation) or freezing (cryoablation) to control abnormal heart rhythms.

Anesthesia – Medicine given through an intravenous (IV). It may be given to make a person feel sleepy or to sleep during a procedure or surgery (for example: during electrical cardioversion).

Anti-arrhythmic medicine – Drugs used to keep the heart beat in a normal sinus rhythm.

Anti-coagulant medicine – Drugs used to make the blood less likely to clot. Also called blood thinners.

Anti-platelet medicine – Drugs used to thin the blood. These aren't as strong as anti-coagulants (blood thinners).

Arrhythmia – An abnormal heart rhythm or irregular heart beat.

Asymptomatic – Having no symptoms or signs of an illness or disease.

Atria – The two upper chambers of the heart (right atrium and left atrium) that receive and collect blood before filling the lower chambers (ventricles).

Atrial fibrillation – An arrhythmia caused by very fast, chaotic/disorganized electrical activity in the atria.

Atrial flutter – An arrhythmia caused by very fast, organized electrical activity in the atria.

Atrial remodelling – Structural changes in the atria caused by disease or aging.

Atrioventricular (AV) node – Part of the heart's electrical conduction system; it co-ordinates electrical signals between the atria and ventricles.

Atypical atrial flutter – Atrial flutter in which an organized electrical impulse circulates around parts of the atria other than the circuit of typical atrial flutter. The circuit of atypical flutter is usually in the left atrium.

Blanking period – The period after ablation, usually 3 months, when a person may have an episode of AF. This may be due to the procedure itself rather than meaning that the procedure didn't work. If AF happens after the blanking period, then the procedure may have to be done again.

Blister pack – An organizing system designed to help someone to remember to take their medicine. Ask your pharmacist about blister packs.

Cardiac electrophysiologist – A doctor who treats problems with the heart's electrical system.

Cardiac tamponade – Bleeding into the sac that surrounds the heart (pericardium). The bleeding compresses/squeezes the heart, which can cause a sudden drop in blood pressure. It is treated by draining fluid.

Cardiomyopathy – Condition where the heart muscle enlarges and/or becomes weaker.

Cardioversion – A way to make the heart switch from an abnormal to a normal rhythm, either by using medicine (chemical cardioversion) or electrical cardioversion.

Cardiovascular system – Also called the circulatory system. It includes the heart and blood vessels of the body. It carries blood, oxygen, and nutrients to the organs and tissues of the body. It also carries the waste and carbon dioxide from these tissues for the body to remove.

Carotid doppler – An ultrasound to view the carotid arteries in the neck.

Catheter – A flexible wire with electrodes used to measure electrical impulses in the heart. Some catheters also deliver therapy, as in ablation.

Computerized tomography (CT) scan – Also called a CAT scan. It's a very detailed type of x-ray.

Congestive heart failure (CHF) – A condition in which the heart can't supply the body with the blood it needs because the ventricles are either too large or weak. It causes fluid to build up in the lungs and/or other tissues.

Contraction – Squeezing action of the atria or ventricles.

CHADS₂ – A scoring tool used to learn a person's risk of having a stroke.

Circulation – The normal flow of blood through the body's blood vessels and organs.

Conscious sedation – Medicine given by IV; the person is not fully "asleep" but may not remember everything about the procedure.

CT angiogram – A CT image of parts of the circulatory system.

Cryoablation – A procedure in which a small portion of heart tissue is destroyed using freezing.

Dosette – Like a blister pack but the pills are placed in a window that can be opened for each day of the week, rather than "punched" out. Ask your pharmacist about dosettes.

Electrical cardioversion – A way to make the heart switch from an abnormal to a normal rhythm using a machine called a defibrillator.

Electrical conduction system – The electrical "wiring" or pathways through which impulses or signals travel through the heart.

Electrical impulses – The electrical energy created by specialized pacemaker cells within the heart that follows a pathway from the atria to the ventricles.

Electrocardiogram (ECG or EKG) – The recording of the electrical activity of the heart.

Electrodes – Sticky discs that are placed on the chest. They pick up the heart's electrical signals during an ECG, Holter monitor, or Event recorder. The metal contacts on the catheters placed in the heart during an electrophysiology study and ablation are also called electrodes.

Electrophysiology lab – A hospital room or area set up to do ablations and other procedures related to the heart's electrical system.

Electrophysiology studies – A procedure where one or more wires (catheters) are passed through the blood vessels and into the heart to record the electrical signals. The studies can help the doctor learn the cause of abnormal heart rhythms. It is one of the tests that can decide if an ablation is needed.

Esophagus (food pipe) – The tube food travels down after it is swallowed. It is directly behind the heart.

General anesthesia – Medicine that causes a person to sleep. It can be given into a vein or can be breathed into the lungs.

HAS-BLED – A scoring system to estimate a person's risk of bleeding (for example: if they are to take a blood thinner).

Heart failure – A condition in which the heart can't supply the body with the blood it needs because the ventricles are either too large or weak.

Heart rate – The speed the heart beats. It is measured in beats per minute (bpm).

Holter monitor – A portable device that records the heart's electrical activity. The test is usually done at home over 24 to 48 hours. Electrodes are placed on the chest and connected to a recorder worn on a belt. The person will carry on with their usual daily activities.

Hypertension – High blood pressure.

International Normalized Ratio (INR) – A blood test to check how well the blood clots when taking some types of blood thinners (like warfarin).

Intravenous – Into the vein.

Local anesthesia – Medicine given to freeze (numb) a specific area of the body.

Lone or Primary atrial fibrillation – AF without underlying heart disease or for which the cause is unknown. It's more common in younger people.

Magnetic resonance imaging (MRI) – A machine that creates detailed images of the body's tissues using magnetic impulses rather than x-rays.

Natural pacemaker – The SA node, found in the top right atrium (see sinoatrial node).

Oral anti-coagulant – A medicine taken by mouth that prevents clots from forming in the blood.

Palpitations – The awareness or sensation that the heart is beating irregularly and/or too fast.

Pericarditis – Inflammation of the sac surrounding the heart. It causes chest pain.

Permanent pacemaker (artificial) – A small device that is implanted under the skin of the chest. Up to 3 wires are placed in different chambers of the heart to prevent pauses and/or control abnormal heart rhythms. This device uses electrical pulses to stimulate the heart to beat at a normal rate.

Phrenic nerve – The nerve that controls the muscle for breathing (diaphragm).

Pill-in-the pocket – A rhythm control treatment plan that can be used for people that don't have many AF episodes. It includes medicine to control the heart rate and rhythm.

Pulmonary veins – Vessels that carry oxygenated blood from the lungs to the left atrium. It is also the site where AF often starts.

Pulmonary vein stenosis – A narrowing or blockage in one of the veins that drains blood from the lungs into the heart. It can cause shortness of breath.

Radiofrequency ablation – A procedure in which a small portion of heart tissue is destroyed using heat

Remodeling – Changes in structure or electrical properties of the chambers of the heart

Rhythm – The pattern of the heart beat.

Sinoatrial (SA) node – The body's natural pacemaker. Found where the superior vena cava and right atrium meet. It creates the first of the electrical signals that make the heart beat.

Sinus rhythm – A normal, steady heart beat, usually between 60 and 90 beats per minute.

Sleep apnea – When the throat muscles relax and block the airway during sleep (obstructive sleep apnea). It sometimes can happen because of a "glitch" in the nervous system that regulates sleep (central sleep apnea). It leads to pauses in breathing and low blood oxygen levels during sleep.

Stroke – Sometimes called a "brain attack". Ischemic stroke is caused by a blood clot blocking a blood vessel to the brain. Hemorrhagic stroke is caused by bleeding into the brain tissue

Subcutaneous – Under the skin.

Symptoms – Usually unpleasant feelings caused by an illness, disease, or a condition.

Tachycardia-induced cardiomyopathy – A type of weakening of the heart muscle caused by long periods of a fast heart rate (usually weeks or months).

Transeptal puncture – A procedure where a long, thin hollow tube is passed from the right atrium into the left atrium. The needle is used to make a hole in the thin wall (septum) separating these chambers. This allows access to the left atrium if an ablation is being done there.

Transient ischemic attack (TIA) – Sometimes called a mini-stroke or stroke warning. It's a short interruption of blood flow to the brain, causing temporary, stroke-like symptoms that don't last longer than 24 hours.

Typical atrial flutter – An arrhythmia in which an organized electrical impulse circulates in the right atrium, around the tricuspid valve.

Valves – Structures in the heart that separate the atria from the ventricles. They open and close, allowing blood to flow through in one direction. The four valves of the heart are the tricuspid, mitral, pulmonic, and aortic valves.

Ventricles – The two (right and left side) lower chambers of the heart. They pump blood to the lungs and around the body.

Ventricular rate – The speed at which the bottom chambers of the heart contract.

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FACTSHEET

To learn more, see [Module 1: What is AF?](#)

COMMON CAUSES OF ATRIAL FIBRILLATION (AF)

Some common causes are:

- high blood pressure (hypertension)
- problems with the valves of the heart
- disease of the heart muscle (cardiomyopathy)
- weak pumping and relaxing action of the heart muscle (left ventricular dysfunction)
- coronary artery disease (developing blockages of the coronary arteries that can lead to a heart attack)
- heart problems you are born with (congenital heart defect)
- heart surgery
- inflammation of the heart muscle or the sac that surrounds the heart
- sick sinus rhythm
- supraventricular tachycardia (svt)
- sleep apnea
- overactive thyroid (hyperthyroid)
- lung disease
- issue with the vagus nerve
- over age 65
- obesity (weight more than 20% higher than it should be/bmi of 30 or more)
- [drinking too much alcohol](#)

WHILE AF IS COMMON IN PEOPLE OVER 65, IT CAN ALSO DEVELOP (FOR NO KNOWN REASON) IN PEOPLE YOUNGER THAN 60.

FACTSHEET

To learn more, see [Module 1: What is AF?](#)

SYMPTOMS OF ATRIAL FIBRILLATION (AF) AND ATRIAL FLUTTER

Some common symptoms may include:

PALPITATIONS OR FEELING LIKE YOUR HEART IS RACING (BEATING VERY FAST)	FEELING VERY TIRED/ FATIGUED OR HAVING NO ENERGY	AN IRREGULAR HEART BEAT OR PULSE RATE
FEELING SHORT OF BREATH OR WEAK WITH LITTLE PHYSICAL EFFORT	CHEST DISCOMFORT	FEELING LIGHT-HEADED OR DIZZY
SWEATING	FEELING ANXIOUS	TROUBLE CONCENTRATING

Less common symptoms include:

NAUSEA	FAINTING OR TEMPORARY LOSS OF CONSCIOUSNESS	URINATING MORE (PASSING WATER)
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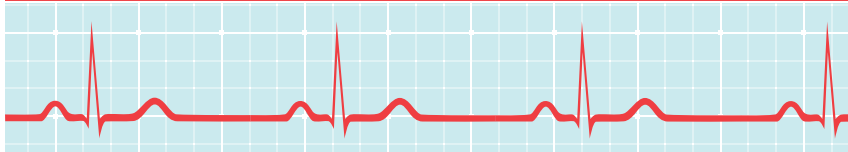
Everyone is different and should be treated based on what bothers them. Some people have no symptoms (they are asymptomatic).

FACTSHEET

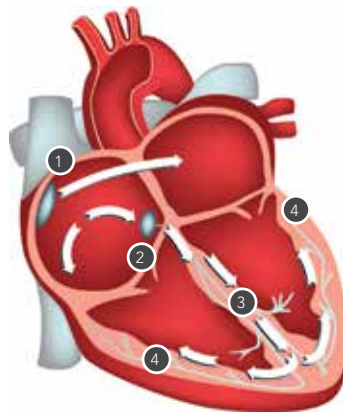
To learn more, see [Module 1: What is AF?](#)

NORMAL SINUS RHYTHM AND ATRIAL FLUTTER

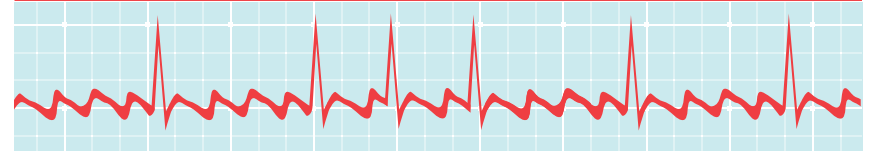
NORMAL SINUS RHYTHM



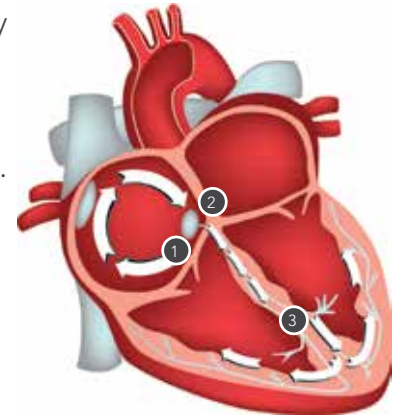
- Electrical impulses normally begin at the sinoatrial (SA) node, the body's natural pacemaker.
- In a normal heart rhythm, the SA node initiates an atrial beat for every ventricular beat (1-to-1 electrical conduction).



ATRIAL FLUTTER



- Atrial flutter is caused by very fast but regular electrical impulses. These impulses often start in the right atrium.
- The electrical impulses travel around and around the heart in an abnormal circular pattern ("circuit").
- The very fast electrical signals cause the atria to beat at up to 300 beats per minute.
- Only some of these fast impulses are sent from the atria to the ventricles, often around 150 beats per minute. In other words, there are 2 atrial beats for every 1 ventricular beat (2-to-1 electrical conduction).

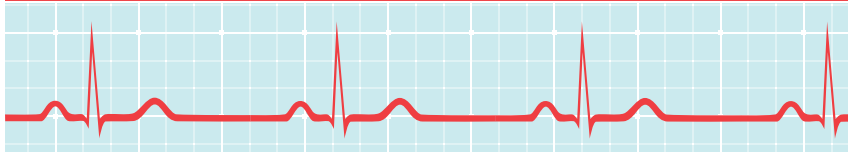


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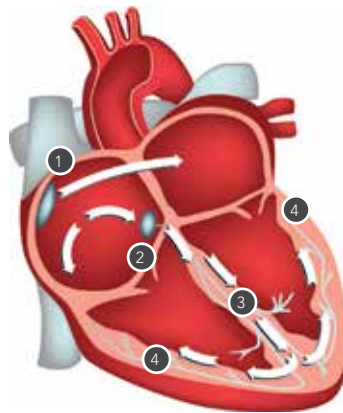
To learn more, see [Module 1: What is AF?](#)

NORMAL SINUS RHYTHM AND ATRIAL FIBRILLATION (AF)

NORMAL SINUS RHYTHM



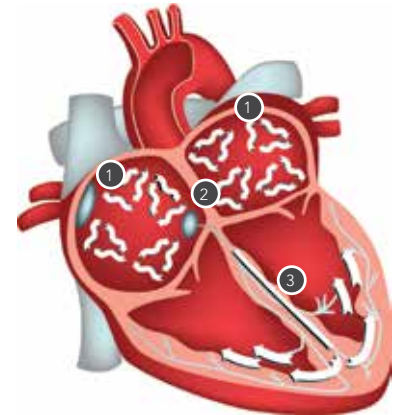
- Electrical impulses normally begin at the sinoatrial (SA) node, the body's natural pacemaker.
- In a normal heart rhythm, the SA node initiates an atrial beat for every ventricular beat (1-to-1 electrical conduction).



ATRIAL FIBRILLATION (AF)



- AF is caused by very fast and chaotic/disorganized electrical activity in the atria (upper chambers). The signals often start in the area around the pulmonary veins.
- The movement in the atria is very fast (350 to 500 beats per minute) and irregular.
- The chaotic signals in the atria drive the ventricles to beat too fast (80 to 200 beats per minute).



FACTSHEET

To learn more, see [Module 1: What is AF?](#)

IMPORTANT POINTS TO REMEMBER ABOUT ATRIAL FIBRILLATION (AF)

- AF is not usually a life-threatening condition.
- Many people with AF live regular, active lives.
- Symptoms during AF vary from person to person. Some may be bothered by their symptoms, while others may not feel any symptoms at all.
- People with AF have a higher risk of stroke, but the risk can be reduced with medicine that “thins” the blood (blood thinners)
- The medicine used to reduce the risk of stroke is decided based on your risk factors for stroke. These include if:
 - you’re in heart failure
 - you’ve high blood pressure
 - you’re over the age of 65
 - you’ve diabetes
 - you’ve had a stroke before
 - you’ve hardening of the arteries (atherosclerosis) and other vascular disease
- Complications of heart failure only happen if AF (at a very fast rate) is left untreated for weeks or months.

THE GOALS OF AF THERAPY ARE TO:

- **DECREASE AND RELIEVE SYMPTOMS**
 - **IMPROVE YOUR WELL-BEING**
 - **REDUCE THE NEED FOR/NUMBER OF HOSPITAL VISITS**
 - **REDUCE THE RISK OF STROKE**
- You don’t have to go to the emergency department or see a doctor every time you have an episode. The decision to seek help should be based on your symptoms.

COMMON TESTS TO DIAGNOSE ATRIAL FIBRILLATION (AF) OR ATRIAL FLUTTER

To help your doctor diagnose AF or atrial flutter, a recording of your heart's electrical activity is needed. This can be done by ordering these tests:

- electrocardiogram (ECG) – a short recording (done right away)
- event monitoring (loop recorder) – a device used to monitor for up to 2 weeks
- holter monitor (a 24 to 48 hour recording device)

Common tests include:

- blood tests – to check thyroid hormones, liver function, kidney function, iron (hemoglobin), blood clotting factors, potassium, calcium, and magnesium
- echocardiogram – an ultrasound of the heart that shows any abnormalities in the heart structure and movement (for example: chambers, valves)

Other tests may include:

- myocardial perfusion scan
- TEE ultrasound
- sleep study
- stress test/treadmill test

Not everyone needs all these tests. It will depend on your medical history and symptoms. Your doctor will decide which tests you need.