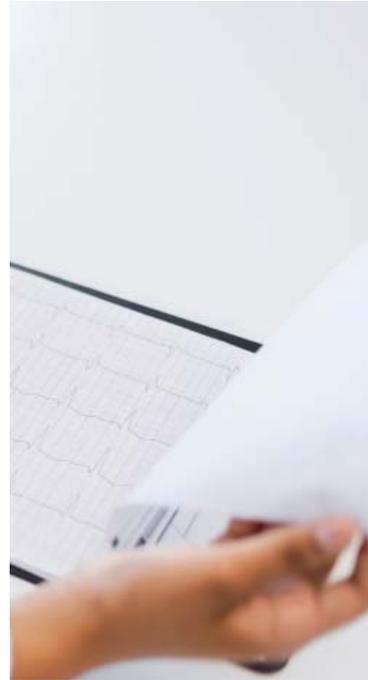


# Tachycardia (fast heart rate)



Working together to improve the diagnosis, treatment  
and quality of life for all those affected by arrhythmias

# Glossary

**Atrium** Top chambers of the heart that receive blood from the body and from the lungs. The right atrium is where the heart's natural pacemaker (sino atrial node) can be found

**Arrhythmia** An abnormal heart rhythm

**Bradycardia** A slow heart rate, normally less than 60 beats per minute

**Cardiac Arrest** A sudden failure in the heart to contract effectively, or at all

**Cardioversion** The use of precisely delivered, timed at a certain point on the ECG, sometimes of a small energy shock, to correct/stop fast heart rhythms

**Defibrillation** The use of a higher energy shock, delivered immediately, to stop fast heart rhythms

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## Important information

This booklet is intended for use by people who wish to understand more about Tachycardia. The information within this booklet comes from research and previous patients' experiences. The booklet offers an explanation of Tachycardia and how it is treated.

This booklet should be used in addition to the information given to you by doctors, nurses and physiologists. If you have any questions about any of the information given in this booklet, please ask your nurse, doctor or cardiac physiologist.

**Heart attack** A medical emergency in which the blood supply to the heart is blocked, causing serious damage or even death of heart muscle

**Tachycardia** Fast heart rate

**Ventricles** The two lower chambers of the heart. The right ventricle pumps blood into the lungs and the left ventricle pumps blood around the body

**Ventricular Fibrillation (VF)** A fast, dangerous heart rhythm which causes the heart to stop pumping effectively. This rhythm needs an electrical shock to stop it and return the heart back to a normal rhythm. A cardiac arrest can soon follow if the rhythm is not treated quickly

**Ventricular Tachycardia (VT)** A fast rhythm which causes the heart to pump less efficiently, and can lead to dizziness, fainting and unconsciousness. If not treated with medication or an electric shock, the rhythm can lead to VF

# The normal electrical system of the heart

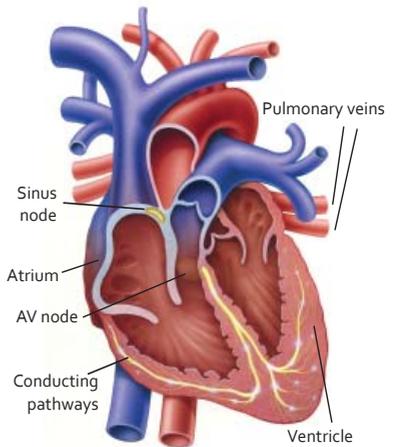
The heart has its own electrical conduction system. The conduction system sends signals throughout the upper (atria) and lower (ventricles) chambers of the heart to make it beat in a regular, coordinated rhythm. The conduction system consists of two areas called nodes that contain conduction cells and special pathways that transmit the impulse.

The normal heartbeat begins when an electrical impulse is fired from the sinus node (SA node), in the right atrium. The sinus node is responsible for setting the rate and rhythm of the heart and is therefore referred to as the heart's 'pacemaker'.

The electrical impulse fired from the SA node spreads throughout the atria, causing them to contract and squeeze blood into the ventricles. The electrical impulse then reaches the atrioventricular node (AV node), which acts as a gateway, slowing and regulating the impulses travelling between the atria and the ventricles. As the impulse travels down the pathways into the ventricles the heart contracts and pumps blood around the body. The cycle then begins all over again.

The normal adult heart beats in a regular pattern 60-100 times a minute; this is called sinus rhythm.

## The heart and normal conduction



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# What are arrhythmias?

Arrhythmias are disorders of your heart's electrical system whereby there is a change in the regular beat of your heart. Sometimes if the conduction pathway is damaged or becomes blocked, or if an extra pathway exists, the heart's rhythm changes. The heart may beat too quickly (tachycardia), too slowly (bradycardia) or irregularly which may affect the heart's ability to effectively pump blood around the body. These abnormal heart rhythms are known as arrhythmias. Arrhythmias can occur in the atria or the ventricles. Arrhythmias may occur at any age, and are most often a nuisance rather than a serious problem.

## What happens in the heart to cause an arrhythmia?

Any interruption in the heart's electrical system can cause an arrhythmia. For example, an irregular heartbeat may begin with an abnormal impulse in a part of the heart other than the normal pacemaker (the sinus node); or the sinus node may develop an abnormal rate or rhythm.

## What can trigger an arrhythmia?

Common causes of arrhythmias include electrical variations that people are born with, which may only become a problem in adult life. Certain triggers can include stress, caffeine, tobacco, alcohol, diet pills, and cough or cold medicines, but there is usually an underlying physical reason for it.

If your heart tissue is damaged as a result of acquired heart disease such as myocardial infarction (heart attack) or congenital heart disease you may also be at risk of developing arrhythmias. In rare cases, it may be that, doctors cannot identify a cause of their arrhythmias.

# How do I know what kind of arrhythmia I have?

If your doctor suspects that you may have an arrhythmia, one or more of the following tests may be performed to determine the cause of your symptoms.

## Electrocardiogram (ECG)

An electrocardiogram is a simple, non-invasive recording of the electrical activity of your heart. Electrode stickers are placed on your chest and connected by wires to a recording machine. Your heart's electrical signals produce a pattern on graph paper in the ECG. By analysing the pattern of these waves, your doctor can often determine what type of arrhythmia you have. ECG testing can be done at rest, or while you are exercising on a treadmill.

## Holter monitor

A Holter monitor shows changes in your heart rhythm over the course of a 24-hour period that may not be detected during a resting or exercise ECG. If your doctor wants you to have this test, you will be asked to go about your daily activities as usual (except for showering or bathing) while you wear a small, portable recorder that connects to electrode stickers on your chest. You will be asked to come back to the hospital the next day so that the information can be retrieved and analysed.

## Cardiac event monitor

If your doctor feels you need to be monitored for several days or weeks, you may need to have a cardiac event monitor. This is a small, battery-powered, portable device that can record an ECG reading when you have symptoms. Your doctor may use this type of recording device if your arrhythmias are infrequent. This device is about the size of a large mobile phone, and can be clipped to your belt or waistband or carried in your purse or pocket. When you feel symptoms, you simply hold the recorder against your chest and press a button; the device then records up to five minutes of ECG readings (please check with your specialist or consult the device specifications).

# Types of arrhythmia

Arrhythmias that occur in the atria (the top chambers of the heart) are either atrial or supraventricular (above the ventricles) in origin whereas ventricular arrhythmias start in the ventricles (the lower chambers of the heart). While some arrhythmias are merely a nuisance, others can be life-threatening. A doctor will determine which type of arrhythmia you may have and treat your symptoms accordingly. In general, ventricular arrhythmias caused by heart disease are the most serious kind, and require prompt medical attention.

## Supraventricular Tachycardia (SVT)

This type of arrhythmia commonly occurs in young, healthy people. Doctors often refer to supraventricular tachycardia (SVT) as re-entry tachycardias as the electrical impulse does not fade out as with the normal heartbeat but continues to move in a rapid circle within the conduction system. This is due to an extra electrical pathway which can form a short circuit within the heart's conduction system. SVT is usually a rapid, regular rhythm. The most common types of SVT are AV-node re-entry tachycardia (AVNRT) and AV re-entrant tachycardia (AVRT).

## AV Nodal Re-entry Tachycardia (AVNRT)

This type of arrhythmia occurs when a problem arises in the way the electrical impulses pass through the AV node. Normally, the AV node acts as a gateway slowing and regulating the impulses as they travel between the atria and the ventricles. In AVNRT there are two pathways, known as dual conduction pathways, that can pass impulses to and from the AV node. This type of arrhythmia usually starts following an early beat (ectopic beat). An electrical short circuit then occurs whereby the electrical impulse rotates around the circuit and with each cycle passes to the ventricles resulting in a very fast heartbeat.

## **AV Re-entry Tachycardia (AVRT) and/or Wolff-Parkinson White Syndrome (WPW)**

In AVRT an extra electrical pathway exists that bypasses the normal conduction system. The pathway directly connects the atria to the ventricles. This extra pathway is known as an accessory pathway. This can be a concealed pathway, meaning there is no evidence of the extra pathway on your ECG, or the pathway may be evident from the resting ECG, as in the case of WPW syndrome. An ECG recording of a patient with WPW syndrome will often show a delta wave which shows the existence of an extra electrical pathway.

Tachycardia may occur when an extra beat (ectopic beat) travels up, or down the accessory pathway and up or down the AV node. This is AVRT, which is an unpleasant, but benign type of tachycardia. Episodes can occur randomly and last for seconds, minutes or hours. In addition, atrial fibrillation (AF) is another arrhythmia that may occur in patients with WPW syndrome. This is uncommon, but may be potentially dangerous. Normally, in AF, the heartbeats travel purely down the AV node. In WPW, the AF has two routes to travel down, the AV node and the accessory pathway. If the pathway is rapidly conducting, the heartbeats, in AF, can travel rapidly down the pathway, causing a fast, unstable tachycardia. This tachycardia is known as pre-excited AF. Usually, a person with WPW syndrome should be referred to an electrophysiologist, for consideration of electrophysiological studies (EPS), and catheter ablation. Catheter ablation has a high chance of curing AF and is performed for two reasons, to cure the symptoms from AVRT and to prevent pre-excited AF in the future.

## **Atrial Fibrillation (AF)**

Atrial fibrillation (AF) is one of the most common types of arrhythmia. It occurs in the atria, in the upper chambers of the heart. The electrical impulse normally originates at the SA node. However in AF, many electrical impulses are fired rapidly and at random throughout the atria down to the ventricles. The resulting heartbeat is irregular and usually fast.

Because the atria are beating rapidly and irregularly (fibrillating), they are unable to completely empty all the blood they receive into the ventricles and this can cause blood clots to form. Therefore, if you are at an increased risk of stroke you may be treated with an anticoagulant.

## **Atrial Flutter**

Atrial flutter also occurs in the atria. In atrial flutter the electrical impulses fire rapidly but the resulting rhythm is regular and organised. The rhythm is due to a re-entry circuit within the atria, whereby the electrical impulse travels in circles leaving and arriving back at the same point. There are several types of atrial flutter, the most common being typical right atrial flutter.

## **Ventricular Tachycardia (VT)**

Ventricular tachycardia (VT) occurs when the electrical impulses arise in the ventricles, causing them to beat at an abnormally fast, regular rate. Because the ventricles are beating rapidly the heart does not work as efficiently. This can cause symptoms of weakness, dizziness, chest pain, shortness of breath or even collapse. There are several different types of VT and the seriousness of the condition can vary. However, VT can be a potentially life threatening heart rhythm as it can progress to ventricular fibrillation and cause the heart to stop beating (cardiac arrest).

There are a number of reasons why people may develop VT. For example, in people who have had a previous myocardial infarction (heart attack), the area of the heart muscle damaged by the heart attack forms scar tissue and this can make the heart susceptible to abnormal heart rhythms. Other people who may experience VT are patients with cardiomyopathy, previous corrective congenital heart surgery or inherited arrhythmias. There is also a small group of people who have VT with a structurally normal heart where the VT may be well tolerated.

## **Ventricular Fibrillation (VF)**

Ventricular fibrillation (VF) occurs in the ventricles, in the bottom chambers of the heart. In VF, the electrical impulses are fired from multiple sites in the ventricles in a very fast and irregular way, causing the heart to quiver rather than to beat and pump blood effectively. VF is an extremely dangerous heart rhythm and prompt emergency care must be provided to get the heart pumping again, or death can occur.

## **What treatments are available to me?**

The results of the tests you have had will determine the type and seriousness of your arrhythmia, and your doctor will then discuss with you the treatment options available. You and your doctor will then decide which one is right for you. Remember, many patients with arrhythmias require no further treatment. The most important aspect of any initial evaluation is to determine the significance of the arrhythmia and the need for any type of intervention.

## **Medicines**

There are a number of drugs that can be used to treat your arrhythmia. Antiarrhythmic drugs are medicines that change the electrical signals in your heart and help prevent irregular or rapid heart rhythms (please refer to our Drug treatment for heart rhythm disorders booklet).

## **Permanent pacemaker**

If you have a slow heart rate your doctor may recommend you have a pacemaker. A pacemaker is a small device used to treat slow heart rhythms, it is implanted beneath the skin below the collarbone and connected to a pacing wire placed inside the heart. The pacemaker delivers a small electrical impulse to stimulate the heart to beat when it is going too slowly.

## **Catheter ablation**

If you have an extra electrical pathway or group of cells responsible for your arrhythmia, your doctor may advise you to have catheter ablation. A catheter ablation blocks the area of extra electrical activity causing the arrhythmias, providing relief for patients who may not have responded well to medications or, for whatever reason, would rather not or cannot take medications. This technique has a high percentage of successfully 'curing' many types of arrhythmias.

## **Internal cardioversion**

Internal cardioversion is a low energy electrical shock delivered inside the heart. Two catheters are inserted into a vein in your groin and a small electrode pad applied to your chest. Your electrophysiologist performs this procedure in the EP lab. During the internal cardioversion, you will be given a short acting sedative to make you sleepy and unaware of the procedure taking place. Internal cardioversion is performed when medications and external cardioversion have been unsuccessful in returning a patient's rhythm back to a normal sinus rhythm.

## **Implantable Cardioverter Defibrillator (ICD)**

This is a device for people who are at risk of life threatening heart rhythms. It is slightly larger than a pacemaker and usually implanted beneath the skin below the collarbone. It is connected to defibrillation/pacing wire(s) positioned inside the heart via a vein. It has the ability to recognise and stop fast ventricular arrhythmias by using extra paced beats, or delivering an electric shock to the heart. It is also capable of pacing the heart to stop it from going too slowly.

If you would like further information regarding tachycardia and the treatments available please call us on 01789 867 501 or email [info@heartrhythmalliance.org](mailto:info@heartrhythmalliance.org).



Arrhythmia Alliance

[www.hearrhythmalliance.org](http://www.hearrhythmalliance.org)

Working together  
to improve the  
diagnosis, treatment  
and quality of life for  
all those affected by  
arrhythmias

Please remember that this publication provides general guidelines only. Individuals should always discuss their own condition with a healthcare professional.

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