STARS
Syncope Trust And Reflex anoxic Seizures

Arrhythmia Alliance

AFAssociation

www.heartrhythmalliance.org

Identifying the undiagnosed person

How mobile devices can make a difference

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

www.heartrhythmalliance.org

Registered Charity No. 1107496

TAKE THE PULSE CHECK CHALLENGE

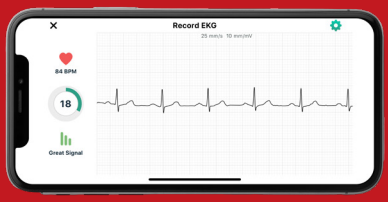
KNOW THE RHYTHM OF YOUR HEART – MANUAL OR MOBILE

it only takes 30 seconds – yet could save your life!

KNOW YOUR PULSE

Is your heart rhythm too fast, too slow, or jumping around (irregular)?
It could be an arrhythmia (a heart rhythm disorder)

Learn to take your pulse to monitor your heart rhythm



KNOW YOUR ECG

Monitor your heart rhythm with a mobile ECG device

It records your heart rhythm and confirms if normal, AF suspected or if you should discuss the results with your doctor

For more information contact:
info@heartrhythmalliance.org

Everyone needs to know their heart rhythm – it could save your life!

- More than ***two million people*** have an arrhythmia (heart rhythm disorder)
- Arrhythmias are the leading cause of ***100,000 sudden cardiac deaths*** each year in the UK; over 250 every day, more deaths than breast cancer, lung cancer and AIDS combined
- There is ***no national programme*** of pulse rhythm checks or heart rhythm screening
- Nearly ***500,000 people in the UK have undiagnosed AF*** (atrial fibrillation; the most common arrhythmia), and are at increased risk of a debilitating or life-threatening AF-related stroke – the most severe type of stroke
- ***120,000 people experience unexplained loss of consciousness*** each year, commonly a sign of a heart rhythm disorder

Glossary

Anticoagulant A group of drugs help to slow down the clotting process in blood and prevent AF-related stroke

Arrhythmia Heart rhythm disorder

Asystole Lack of any electrical activity in the heart, no pulse (heart beat)

Atria The two upper chambers of the heart

Atrial Fibrillation (AF) The most common heart rhythm disorder, caused by chaotic rhythm in the atria (top chambers of the heart)

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

Cardiologist A doctor who has specialised in the diagnosis and treatment of patients with a heart condition

Ectopic Extra beats arising from the atria or ventricles

Electrocardiogram (ECG) A simple test that records the heart's rhythm and rate

Sino-atrial node (SA node) The natural pacemaker of the heart

Sinus rhythm Normal regular heart rhythm
Stroke A medical condition which is now referred to as a 'brain attack' where the brain is deprived of oxygen

Contents

Sudden cardiac arrest (SCA) When the heart stops beating suddenly and unexpectedly without warning

Supraventricular tachycardia (SVT) Rapid abnormal heart rhythm that begins in the upper chambers of the heart

Syncope A medical term for a faint caused by a sudden lack of blood supply to the brain (often due to bradycardia or asystole)

Tachycardia A fast heart rate, over 90 beats per minute

Ventricles The two lower chambers of the heart, providing most of the pumping force

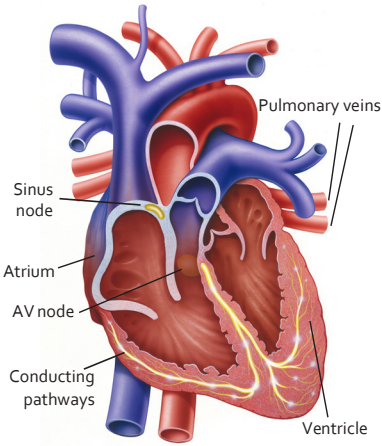
The normal electrical system of the heart

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 sinoatrial node (SA node), in the right atrium. The SA node is responsible for setting the rate and rhythm of the heart and is therefore referred to as the heart's 'pacemaker'.

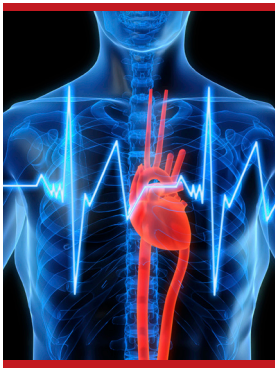
The electrical impulse fired from the SA node spreads throughout the atria, causing them to contract and squeeze blood into the ventricles. The electrical impulse then reaches the atrioventricular node (AV node), which acts as a gateway, slowing and regulating the impulses travelling between the atria 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



What is an arrhythmia?



Arrhythmias are disorders of your heart's electrical system whereby there is a change in the regular rhythm 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?

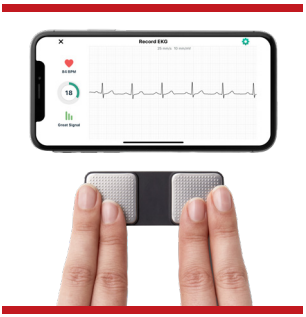
Any interruption in the heart's electrical system can cause an arrhythmia. For example, an irregular heartbeat may begin with an abnormal impulse in a part of the heart other than the normal pacemaker (the sinus node); or the sinus node may develop an abnormal rate or rhythm.

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. External 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 because 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 doctors cannot identify a cause of the arrhythmia.

Could mobile ECG technology work for you?



A number of new devices are now available that can measure your heart rhythm and detect if you may have an arrhythmia (irregular heart rhythm).

Often, when someone visits their GP following symptoms, such as palpitations, the irregular heart rhythm may not be detectable, and people can be sent to a specialist for a 12-lead ECG recording to determine if there is an arrhythmia.

Many people purchase these devices themselves to record when they are experiencing symptoms, such as palpitations, breathlessness or an irregular heart rhythm, so that they can share the information recorded with their healthcare professional. Many use devices to monitor an existing arrhythmia for reassurance or when to go to their doctor for advice.

Even more people are now using a device for reassurance and to save unnecessary visits to a healthcare professional. Knowing that your palpitations or irregular heart rhythm may be caused by other benign reasons is in itself a great reassurance.

DO NOT use with a cardiac pacemaker, ICD, S-ICD or CRT or any other implanted electronic devices.

What devices are available?

Automated blood pressure monitors for detecting AF

Some automated blood pressure (BP) monitors have a built-in AF algorithm to analyse any irregularity of the pulse rate and apply a threshold for detecting AF. These are referred to as 'AF detectors' and are specific for detecting AF. One example is the WatchBP Home A- other monitors are also available.

Continuous ECG monitors

Continuous ECG monitors (Holters) can continuously record cardiac electrical activity, typically for 24 to 48 hours. This period has now been extended to several weeks with the newer monitoring systems. These devices are used to investigate suspected occasional arrhythmias which have not been detected during shorter, single-time point ECG recordings.

Event ECG monitors

An event ECG device allows intermittent recording of the electrical activity of the heart and is usually given to patients who experience infrequent symptoms and require monitoring over a longer period of time. Patients will initiate an ECG recording when they experience symptoms of arrhythmia (for example: breathlessness, palpitations and/ or lightheadedness). Zenicor offers one such hand-held device, which can be used to record an ECG. Although this data is not visible to the patient, it is stored on a centralised database, which can be viewed by their healthcare professional.

Mobile ECG recorder and Smartphone applications

Several smartphone apps exist to determine heart rate using the built-in camera. These apps use the smart phone flash or light source and camera to obtain a recording of pulse waves.

Other systems allow electrode attachments to connect with a compatible mobile device (smartphone or tablet computer) and transmit, record, auto-analyse, store and view an ECG recording using a dedicated app. The ECG is captured digitally and can be viewed and transmitted to a secure server.

The apps also have built-in AF detection algorithms that provides an instant interpretation to the user. There are various options emerging in regards to a mobile ECG device. These include the Kardia mobile ECG and app (AliveCor, Inc.) and the Apple watch series 4, 5 and onwards, which allow for an individual to conveniently record and monitor their readings.

Manual pulse check

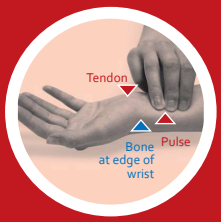
If you do not have access to a device to check your pulse, a manual pulse check is still an accurate way to detect your heart rhythm.

Know Your **Pulse** in four steps

www.knowyourpulse.org

1. To assess your resting pulse rate in your wrist, sit down for 5 minutes beforehand. Remember that any stimulants taken before the reading will affect the rate (such as caffeine or nicotine). You will need a watch or clock with a second hand.

2. Take your watch and hold your left or right hand out with your palm facing up and your elbow slightly bent.



3. With your other hand, place your index and middle fingers on your wrist, at the base of your thumb. Your fingers should sit between the bone on the edge of your wrist and the stringy tendon attached to your thumb (as shown in the image). You may need to move your fingers around a little to find the pulse. Keep firm pressure on your wrist with your fingers in order to feel your pulse.

4. Count for 30 seconds, and multiply by 2 to get your heart rate in beats per minute. If your heart rhythm is irregular, you should count for 1 minute and do not multiply.

Record your **pulse**

Day	Results		Activity (e.g after a run)
	am	pm	
1			
2			
3			
4			
5			
6			
7			

Why is it important to know your pulse?

KNOW YOUR PULSE EVENTS IDENTIFY UNDIAGNOSED PEOPLE WITH ARRHYTHMIAS

Hundreds, if not thousands, of 'Know Your Pulse to Know Your Heart Rhythm' events and awareness campaigns are hosted globally annually. During these events, we teach people how to check their own pulse to become familiar with their heart rhythm, explain the importance of being pulse rhythm aware, and offer the use of mobile ECG technology, to check people's heart rhythm.

We frequently identify AF when using a mobile device and all too often the person is unaware they have an arrhythmia. We offer to email the copy of the ECG to their healthcare professional or to their personal email so they can share with their GP. With confirmation of a diagnosis this has gone on to save many lives from the devastation of an AF-related stroke as they receive appropriate anticoagulation therapy and ultimately treatment for AF.

One person attending a WHRW Know Your Pulse event used the mobile device where it detected the possibility of an arrhythmia. As the event was at St Bartholemew's Hospital, London, with permission, the person immediately had a full 12-lead ECG and gained a diagnosis of left bundle branch block (LBBB). This highlights the importance of being aware of the rhythm and rate of your heart. For further information about bundle branch block, please visit our website.

"I want everybody to become pulse rhythm aware and new mobile ECG technology makes it even easier and quicker to confirm an irregular heart rhythm. Using manual pulse rhythm checks and mobile ECG technology will help us to save thousands of lives from undiagnosed AF-related strokes and sudden cardiac death, reduce the levels of misdiagnosis, and by ruling out benign ectopic heart beats, reduce worry and concern of individuals and unnecessary hospital admissions."

Trudie Lobban MBE, FRCP (Edin)
Founder & Trustee,
Arrhythmia Alliance

A mobile ECG makes a surprising discovery

John McCann wanted to show his colleagues his low resting heart rate but found out he had atrial fibrillation!

"I had no palpitations or any other recognisable symptoms"

"In April 2016, one of my colleagues purchased an AliveCor Kardia device to attach to her mobile phone and was checking our rates and rhythms with the team. Having a regular sports routine, I wanted to show off my resting heart rate compared to the 70-80 bpm of the others. Sure enough, when my turn came, my resting rate was 52 bpm. However, I could see from the trace that the ECG shape was wrong and the inbuilt diagnostics of the app concluded that I should contact a healthcare professional to assess AF" says John McCann, who was at that time an undiagnosed person with AF!

"I asked my colleague to run the trace again, as I had no palpitations or any other recognisable symptoms. The same result: check with a professional to confirm possible AF.

"I took a digital copy of the trace and sent it to a local specialist in arrhythmias, who advised me to go to my hospital the next day...and 12-lead ECG confirmed that I was indeed in AF."

Subsequently, John had an echocardiogram to assess the overall heart structure and discussed his management options with his Consultant. All the while he remained effectively symptom-free apart from some breathlessness playing football or squash, but then how many 57-year olds don't get tired in these activities?

John added, "In June 2016, I had a cardioversion to restore sinus rhythm and this was successful. A key part of my medication was to ensure that I was taking anticoagulation to prevent an AF-related stroke."

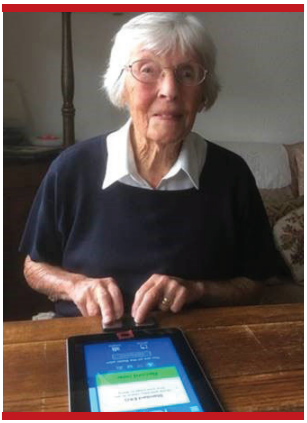
Tony

In 2015 Tony, a 58 year old Yorkshire man living in Glasgow, experienced his first signs of cardiac problems when he thought he was suffering a heart attack. With a racing heartbeat and discomfort in his chest, he was rushed to hospital showing typical signs of a heart attack. However, thankfully, the doctors in A&E found his ECG to be normal.

Over the next two years he suffered further attacks that were both frightening and painful but clinical investigations were struggling to find a cause. Tony was then introduced to a Consultant Cardiologist at Glasgow Victoria Hospital. The cardiologist pointed out that what he needed was to catch an event as it happened and that is when he recommended a mobile ECG device.

Within two weeks, Tony had captured an event, sent it to his cardiologist and had his diagnosis confirmed as atrial fibrillation (AF). He was then prescribed anticoagulant therapy to reduce his risk of an AF-related stroke and treatment so that his AF is now under control. Needless to say, Tony is very grateful for his mobile ECG device and he continues to use it to monitor his condition.

Pam



A few months ago, Pam started to experience episodes of palpitations and breathlessness. These are typical symptoms of atrial fibrillation (AF). Often being an intermittent arrhythmia however, her doctor was struggling to confirm this possible diagnosis. So he recommended that Pam should get a Kardia Mobile to use with a smartphone and capture events as they happen.

With the help of her daughter Carol, Pam was soon up and running and sending in ECG recordings to her consultant. After a few weeks of recordings and periodic visits to her doctor, the good news is that he was able to confirm that it was not AF after all. He did proudly announce to her though, that same day he had captured another patient with AF with the Kardia device. Pam is 96 and lives happily in Gloucestershire.

If you have a story you would like to share, or would like to know more about mobile ECG devices, please email: info@heartrhythmalliance.org or call 01789867501.

This booklet has been written to support those diagnosed with an arrhythmia and their carers, who struggle to find information on this condition. Without donations and fundraising, we would not be able to provide support through our award-winning resources and helpline.

Please donate to support our vital work at
www.heartrhythmalliance.org/aa/uk/get-involved/donate

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"A very effective resource which helped in detecting my AF"

Allan, Leicestershire

To view our patient resources, scan the QR code below:

Please remember that this publication provides general guidelines only. Individuals should always discuss their condition with a healthcare professional. If you would like further information or would like to provide feedback, please contact us.

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Founder and Trustee:
Trudie Lobban MBE, FRCP (Edin)

If you would like further information or would like to provide feedback please contact Arrhythmia Alliance, AF Association or STARS.