

Arrhythmia Info, Symptoms, and Causes FAQ

Q. What is an Arrhythmia?

- A.** The human heart has four chambers. The two upper chambers are called “atria” (the singular is “atrium”). The two lower chambers are called “ventricles”. Contraction of the ventricles generates a pulse, and the rate of ventricular contraction is the same as the heart rate. Your heart has an electrical conduction system, which generates a regular rhythm, allowing the ventricles to pump blood to all parts of your body.

Normally, the human heart contracts between 60 and 100 beats per minute. Each heartbeat begins with the natural pacemaker of the heart, the sinoatrial or sinus node, located in the right atrium. The sinus node normally sends out an electrical impulse that spreads throughout the atria to an area between the two atria called the atrioventricular (AV) node. The AV node, the electrical hub of the heart, connects to a group of special electrical fibers (left and right bundle branches) that conduct the impulse to the ventricles below. As the electrical impulse travels through the heart, it contracts. First the atria contract, “loading up” the ventricles, followed by contraction of the ventricles, sending blood to the rest of your body.

“Arrhythmia” is a general term, which refers to any abnormality of heart rhythm. The heart can beat too fast (tachycardia), too slowly (bradycardia), or irregularly (often called fibrillation or flutter). Arrhythmias can start in one of the two upper chambers of the heart (the atria), or in one of the lower two chambers (the ventricles). These arrhythmias may be brief and go unnoticed, or they may cause significant symptoms. Arrhythmias can occur at any age, and are most often a nuisance rather than a serious problem.

Most arrhythmias do not need extensive examinations or special treatments. However, some arrhythmias are signs of significant heart disease. In a few people with serious symptoms, arrhythmias themselves are dangerous. These arrhythmias require prompt medical treatment to maintain a regular heartbeat

Q. What happens in the heart when an Arrhythmia occurs?

- A.** In general, the abnormalities that result in arrhythmias are attributed to the following:
- Abnormal function of the cells in the sinoatrial node (sick sinus syndrome), in which these cells do not fire or transmit impulses properly, and the heart beats too slowly.
 - Delayed or absent conduction through the AV node and bundle branch system, also leading to a slow heartbeat. This disorder is also called heart block.
 - An extra pathway in the conduction system, causing additional heartbeats or a rapid heart rhythm.
 - Electrical impulses arising from places in the heart other than the sinoatrial node, also leading to a rapid heart rate.

Q. What are the causes and triggers of Arrhythmias?

- A.** Causes and triggers may include:
- High stress, anger or hostility.

- Caffeine or chocolate consumption.
- Alcohol consumption.
- Some over-the-counter medications, including those for coughs, colds or weight loss. This includes certain “natural” or herbal remedies. Guarana, ginseng and ephedra (ma huang) are all stimulants that can increase heart rate, interfere with sleeping, and cause palpitations and other symptoms of arrhythmia.
- Some illegal drugs, like cocaine over stimulate the heart.
- Sleep disorders such as sleep apnea.
- Previous heart damage from a heart attack or blockages in the arteries.
- Congenital heart disease or inherited defects (e.g., long QT syndrome, Brugada syndrome, hypertrophic cardiomyopathy)
- Abnormalities of heart structure or function. These include cardiomyopathy (in which the heart muscle is abnormally enlarged, weakened, thickened and/or stiffened) or valvular heart disease.
- Side effects from medications.
- In many patients, however, a specific trigger or cause cannot be found.

Q. What are the symptoms of Arrhythmias?

A. Arrhythmia symptoms vary from person to person, and depend largely on the source of the abnormality. Some people have no symptoms at all. If symptoms are experienced, these may include any of the following:

- palpitation (feeling your heart beating in your chest) or rapid heartbeat
- fainting spells (also called "syncope")
- dizziness or light-headedness
- fatigue
- shortness of breath ("dyspnea")
- chest pressure or pain (angina)

These symptoms may be caused by arrhythmias or by other medical conditions, some quite benign and some more serious. Only a healthcare professional can determine what is causing your symptoms. Englewood Hospital and Medical Center (EHMC) established a comprehensive arrhythmia center in 2001 to evaluate and treat arrhythmia patients. If you have been experiencing any of these symptoms regularly, it is important to see your doctor or to visit us at the Arrhythmia Center.

Q. What are the different types of Arrhythmias?

A. There are many types of arrhythmias, classified by where they occur in the heart (atria or ventricles) and by what happens to the heart's rhythm. Abnormal rhythms arising in the upper chambers are called atrial or supraventricular (above the ventricles) arrhythmias. Abnormal rhythms arising in the lower chambers are called ventricular arrhythmias. While some are merely a nuisance, others can be life-threatening. A doctor can determine which type of arrhythmia you may have. In general, ventricular arrhythmias caused by heart disease are the most serious kind, and require prompt medical attention.

Arrhythmias that originate in the upper chambers (atria) include:

Sinus arrhythmia: Normal cyclic changes in the heart rate occur during breathing. This is a normal finding. Sinus arrhythmia is common in children, and often noticed in adults.

Sinus tachycardia: The sinus node sends out electrical impulses faster than usual, speeding up the heart rate.

Sick sinus syndrome: The sinus node fires slowly, or it abruptly pauses, causing the heart rate to slow down. Sometimes the rate alternates between one that is too fast and one that is too slow (tachycardia-bradycardia or tachy-brady syndrome).

Premature supraventricular contractions or premature atrial contractions (PAC): An early beat which arises from the atria, causing the heart to beat before the next regular heartbeat should have taken place. PAC's are extremely common; they often do not produce symptoms nor require special treatment. They are a common cause of palpitation in people without arrhythmias.

Supraventricular tachycardia (SVT), paroxysmal atrial tachycardia (PAT): A rapid heart rhythm which arises from a site in the atria. In paroxysmal tachycardia, repeated periods of very fast rates begin and end suddenly.

Atrioventricular (AV) block: An electrical impulse from the atria is either delayed or blocked on its way to the ventricles. This disorder is subdivided into first, second, and third degree block. In first degree block, the impulse is merely delayed, and the heart rate is not slowed. In second and third degree block, some impulses do not reach the ventricles, abnormally slowing the heart rate.

Atrial fibrillation: Electrical impulses excite the atria in a very fast and uncontrolled manner, and arrive in the ventricles in a completely irregular fashion. This causes the heartbeat to be completely irregular. Atrial fibrillation is the most common type of arrhythmia in adults, affecting some 2 million Americans. Because the ineffective contractions of the atria can cause blood clots to form, people with atrial fibrillation have an increased risk of stroke and must be treated. They may also continue to take drugs that thin the blood after their initial arrhythmia therapy is completed.

Atrial flutter: Rapidly fired impulses cause the muscles in the atria to contract quickly (250-300 times a minute) leading to a very fast, steady heartbeat. There is also a risk of stroke as described in the previous section.

Wolff-Parkinson-White (WPW) syndrome: In WPW syndrome, an abnormal congenital bridge of tissue connecting the atria and ventricles, called an "accessory pathway" or "bypass tract", causes the electrical impulse to arrive at the ventricles bypassing the normal electrical hub of the heart, the AV node. This bypass tract can set up various types of electrical circuits and rapid heart rhythms. This disorder has a small risk of sudden death.

Arrhythmias that begin in the lower chambers (ventricles) include:

Premature ventricular complexes (PVC): During PVCs an electrical impulse arises from a lower chamber causing an early heartbeat that generally goes unnoticed. The heart then seems to pause until the next beat of the ventricle occurs in a regular fashion. PVCs are very common and often require no treatment. For symptomatic patients, simple lifestyle changes such as reducing stress or avoiding caffeine may be adequate. Sometimes, medications are necessary to alleviate symptoms.

Ventricular tachycardia: During ventricular tachycardia, the heart beats rapidly due to electrical impulses arising from the ventricles (rather than from the atria). Prolonged ventricular tachycardia (more than 30 seconds) is dangerous; it can lead to cardiac arrest, particularly in patients with underlying heart disease. There are some more benign forms of ventricular tachycardia that may be easily treated and have minimal risk of serious consequences.

Ventricular fibrillation: Electrical impulses from multiple sites in the ventricles are fired in a very rapid and uncontrolled manner, causing the heart to quiver rather than to beat and pump blood. Ventricular fibrillation is a form of cardiac arrest, and emergency care (CPR, defibrillation) must be provided to the patient within minutes to get the heart pumping again, or death can occur.

Q. What if I still have questions about Arrhythmias?

A. For more information, call the Arrhythmia Center at 201-894-3533.