

World HEART Rhythm Awareness Week

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Atrial flutter



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heart's right atrium (right upper chamber). During atrial flutter, the short circuit - a circular electrical pathway - allows the electrical impulse to quickly move around the right atrium, causing between 240 and 340 contractions per minute. Rapid contractions prevent the chambers from filling completely between beats. The ventricles (lower chambers) also beat faster, though not usually quite as fast. The rate is based on the ratio of atrial beats to ventricular beats.

Atrial flutter is classified as typical or atypical (non-typical) depending on the location of the short circuit - the pathway that allows the electrical signal to move too fast around the heart. While the symptoms are similar, the treatments may differ.

Typical atrial flutter is localized to the right atrium. This type of atrial flutter can be cured with a short outpatient catheter ablation procedure.

Atypical atrial flutter refers to atrial flutter arising in the left atrium. Most types of atypical atrial flutter can also be treated with catheter ablation, but the procedure is longer and more involved.

Atrial flutter may cause no symptoms at all, or they may cause any of the following: stroke, palpitations (a fluttering in the chest), dizziness or fainting, shortness of breath and fatigue. Atrial flutter is usually an age-related arrhythmia because it rarely occurs before the age of 50 but then becomes more common. The other causes include; prior cardiac surgery and catheter ablation for atrial fibrillation.

Atrial flutter is normally diagnosed using an electrocardiogram (ECG or EKG). If the diagnosis is still in question, your doctor may recommend a Holter monitor, an event monitor or an electrophysiological study, during which a narrow, flexible tube called a catheter, is threaded through a vein to your heart under light sedation. Fine wires inside the catheter can help pinpoint the abnormal signal.

Atrial flutter if ignored can lead to serious complications. Blood left to pool in the upper chambers after an inefficient heartbeat increases the risk of clot formation. If a blood clot travels from the heart into the bloodstream, it could become lodged in an artery and cause a stroke. If the heart beats very quickly over a long

period of time, it may lead to cardiomyopathy, a weakening of the heart muscle.

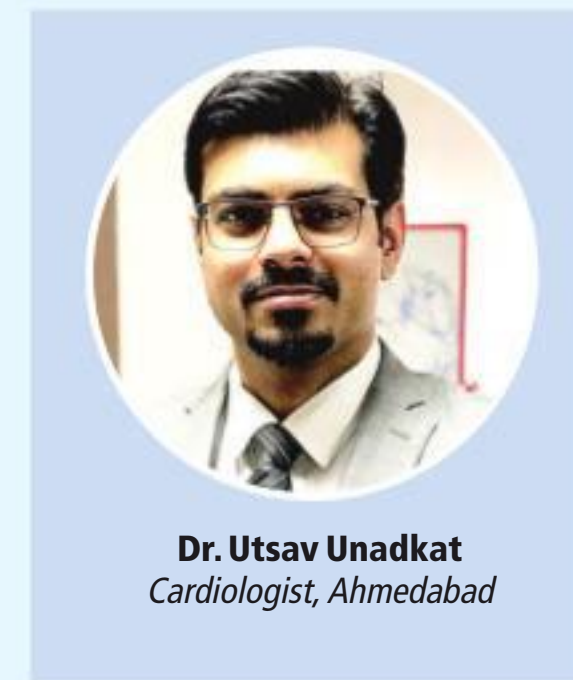
Sometimes, atrial flutter goes away by itself and no further action is needed. If it persists, your doctor may pursue any of the following treatments: treatment of any underlying conditions and other procedures such as catheter ablation, a procedure to destroy the errant electrical pathways; performed together with an electrophysiological study.

Cardioversion - small, controlled shock to the chest done under anesthesia to provide short-term correction of the heart rhythm

Medications to control the heart rhythm, called anti-arrhythmics, may be less effective than catheter ablation. Blood thinners and medications to prevent blood clots are also used.

Atrial flutter can be prevented by controlling or preventing the risk factors. Staying at a healthy weight, drink alcohol in moderation, stop smoking and tobacco use, control high blood pressure and diabetes. Visit your doctor immediately if you notice any of the possible symptoms of atrial flutter.

Ventricular fibrillation



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Ventricular fibrillation (VF) is a life-threatening cardiac condition posing a significant health concern. The prevalence of VF varies depending on the population studied and the underlying risk factors. It is estimated that VF accounts for approximately 75-80% of all cases of sudden cardiac arrest, making it a significant contributor to cardiovascular mortality worldwide.

In this condition, the heart's normal rhythm is disrupted, and instead of contracting and pumping blood effectively, the ventricles quiver or fibrillate, leading to a significant decrease in cardiac output. Without prompt medical intervention, VF can rapidly progress to cardiac arrest and ultimately result in death.

VF typically occurs as a result of underlying heart disease or structural abnormalities, such as coronary artery disease, heart attack, cardiomyopathy, or heart valve disorders. Other factors that can trigger VF include electrolyte imbalances (such as low potassium or magnesium levels), drug toxicity, severe physical trauma, electric shock, or certain genetic conditions that affect the heart's electrical system.

The most common signs of VF are sudden collapse or fainting because the muscles and brain have stopped receiving blood from the heart. These symptoms include; shortness of breath, nausea & vomiting, worsening of chest pain or angina, swelling in the feet due to fluid retention, loss of consciousness and no pulse. Without immediate attention, a person is unlikely to survive.

Emergency treatment focuses on restoring blood flow as quickly as possible to the organs, including the brain. The person may also receive treatment to reduce the risk of a recurrence. The main focus of treatment is to restore the heart's normal rhythm as quickly as possible. The most effective intervention is defibrillation, which involves delivering an electric shock to the heart using a device called a defibrillator. This shock interrupts the chaotic electrical activity and allows the heart's natural pacemaker to regain control, re-establishing a coordinated heartbeat. Automated external defibrillators (AEDs) are widely available in public spaces and can be used by trained individuals to deliver timely defibrillation in cases of cardiac arrest.

In addition to defibrillation, cardiopulmonary resuscitation (CPR) is crucial in supporting circulation and oxygenation until advanced medical care can be provided. The prompt initiation of CPR can significantly improve the chances of survival for individuals in VF.

Once the heart's rhythm has been restored, further treatment is directed towards identifying and addressing the underlying cause of VF. This may involve diagnostic tests, such as electrocardiography, echocardiography, blood tests, or coronary angiography, to assess the heart's structure and function. Medications may be prescribed to stabilize the heart's electrical activity, control blood pressure, or manage underlying heart conditions. They may prescribe medications, such as; beta-blockers, angiotensin converting enzyme inhibitors, calcium channel blockers.

In some cases, individuals at high risk of recurrent VF may require implantable devices, such as implantable cardioverter-defibrillators (ICDs). These devices continuously monitor the heart's rhythm and deliver an electrical shock if VF or other life-threatening arrhythmias occur. ICDs have been shown to be highly effective in preventing sudden cardiac death in individuals with a history of VF.

Prevention of VF involves managing and treating underlying heart conditions and reducing modifiable risk factors. This may include lifestyle modifications such as regular exercise, a heart-healthy diet, smoking cessation, and control of blood pressure and cholesterol levels. In individuals with known heart disease, adherence to prescribed medications and regular follow-up visits to doctor can minimize the risk of VF.

Sick sinus syndrome (Sinus node dysfunction)

Sick Sinus Syndrome (SSS), also known as sinus node dysfunction, is a complex and challenging condition affecting the electrical activity of the heart. It primarily involves the dysfunction of the sinus node, the heart's natural pacemaker. SSS poses a significant clinical concern as it can lead to a variety of symptoms and potentially life-threatening complications.

The prevalence of SSS varies across different populations and countries. According to available studies, the estimated prevalence of SSS in the general population ranges from 0.1% to 2%. However, it is important to note that these estimates may vary depending on the study methodology, population characteristics, and diagnostic criteria used.

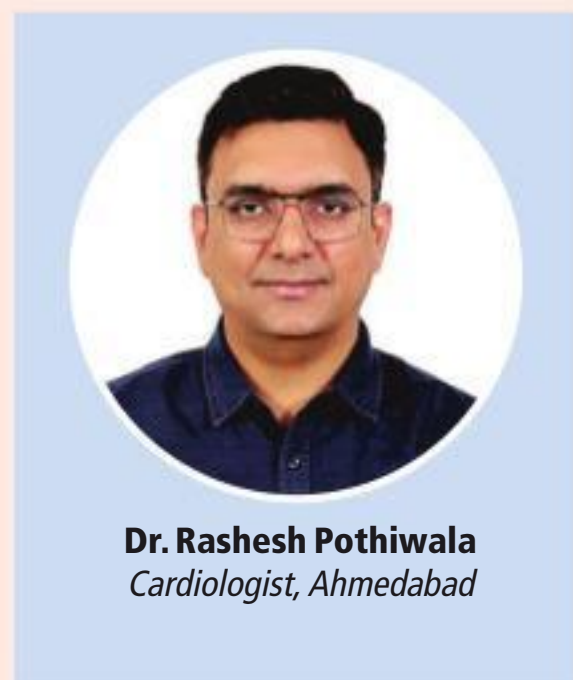
Sinus node dysfunction is a disease of older adults, although it can occur at any age. The mean age of a patient with sinus node dysfunction is 68 years. Sinus node dysfunction develops in one of every 600 cardiac patients of 65 years of age or older. Males and females are equally affected.

The causes of SSS are multifactorial, often involving age-related degenerative changes, underlying heart diseases, or genetic predisposition.

Fibrosis and remodeling of the sinus node, resulting from age or cardiovascular diseases, can disrupt the normal electrical impulses, leading to dysfunction. Additionally, certain medications, such as beta-blockers and calcium channel blockers, can contribute to sinus node dysfunction.

SSS can manifest with a wide range of symptoms, varying from subtle to severe. Patients may experience episodes of bradycardia, tachycardia, or both, leading to symptoms such as palpitations, dizziness, fatigue, syncope, or even heart failure. The variability and nonspecific nature of these symptoms often make diagnosis challenging.

Accurate diagnosis of SSS involves a combination of clinical assessment, electrocardiography (ECG), and cardiac monitoring. A 12-lead ECG may reveal sinus bradycardia, sinus arrest, sinus exit block, or atrial tachyarrhythmias. However, since SSS can be intermittent, additional monitoring methods, such as Holter monitoring, event recorders, or implantable loop recorders, may be necessary to capture episodes of abnormal sinus node function. Electrophysiological studies (EPS) can provide valuable information regarding the extent and mechanisms of sinus



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node dysfunction.

The management of SSS depends on the severity of symptoms, associated comorbidities, and the risk of complications. In asymptomatic cases, observation and regular follow-up may suffice. Symptomatic patients often require treatment to alleviate symptoms and prevent adverse outcomes. Pharmacological therapies, such as pacemaker implantation, are the cornerstone of treatment for bradycardia-associated

symptoms. Pacemakers, including single- and dual-chamber systems, help restore and maintain the heart's normal rhythm. Dual-chamber pacemaker is recommended in patients with sinus node dysfunction due to increased risk of AV block. In patients with tachycardia-related symptoms, antiarrhythmic medications or catheter ablation may be considered.

The prognosis of SSS depends on various factors, including the underlying cause, associated comorbidities, and the promptness of diagnosis and treatment. With appropriate management, most patients can experience improved quality of life. However, SSS can be associated with complications such as atrial fibrillation, stroke, and heart failure. Regular follow-up visits, adherence to prescribed medications, and lifestyle modifications play crucial roles in long-term management.

Sick Sinus Syndrome, characterized by sinus node dysfunction, poses a diagnostic and therapeutic challenge due to its variable presentation and potential for complications. Early recognition and appropriate management strategies are essential for improving patients' symptoms, reducing the risk of adverse events, and enhancing their overall well-being.

Premature heartbeats

Premature heartbeats, also known as premature ventricular contractions (PVCs) or premature atrial contractions (PACs) are irregular heart rhythms that occur when the heartbeats deviate from the normal rhythm. In a healthy heart, electrical signals regulate the timing and coordination of the heart's contractions. However, in the case of premature heartbeats, additional electrical impulses disrupt this rhythm and cause the heart to contract prematurely.

PVCs occur when the ventricles, the lower chambers of the heart, contract too early. This results in an extra heartbeat that interrupts the regular rhythm. On the other hand, PACs occur when the atria, the upper chambers of the heart, contract prematurely. Both PVCs and PACs can be perceived as a skipped heartbeat or an extra beat.

In many cases, premature heartbeats are harmless and do not require treatment. They may occur sporadically and go unnoticed. However, some individuals may experience frequent or persistent premature heartbeats, which can be symptomatic and concerning. Common symptoms include a fluttering sensation in the chest, a



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racing or pounding heartbeat, lightheadedness, and occasional chest discomfort.

Various factors can contribute to the occurrence of premature heartbeats. These include:

Stress and anxiety: Emotional stress, anxiety, and excessive caffeine or alcohol consumption can trigger premature heartbeats.

Stimulants: Certain substances like nicotine,

caffeine, and illicit drugs can stimulate the heart and increase the likelihood of premature heartbeats.

Medications and medical conditions: Certain medications, such as those used to treat asthma or high blood pressure, can induce premature heartbeats. Additionally, underlying medical conditions like thyroid problems, electrolyte imbalances, and heart diseases can also contribute to their occurrence.

Lifestyle factors: Lack of sleep, excessive physical activity, and a poor diet can increase the likelihood of experiencing premature heartbeats.

Heart abnormalities: Structural abnormalities in the heart, such as a heart valve disorder or prior heart attack, can disrupt the normal electrical signaling and lead to premature heartbeats.

While most cases of premature heartbeats do not require treatment, medical intervention may be necessary if they become frequent, severe, or are associated with underlying heart conditions. In such cases, the underlying cause needs to be identified and addressed. Diagnostic tests, such as an electrocardiogram (ECG) or Holter monitor, may be used to evaluate the heart's electrical activity and identify the type and frequency of

premature heartbeats.

Treatment options for persistent or symptomatic premature heartbeats may include making lifestyle changes such as reducing stress, avoiding stimulants, getting adequate rest, and adopting a healthy diet can help manage and reduce the frequency of premature heartbeats.

Pharmacological interventions include; medications such as anti-arrhythmics may be prescribed to regulate the heart's electrical activity and reduce the occurrence of premature heartbeats.

In cases where medications are ineffective or not well-tolerated, catheter ablation may be considered. This procedure involves the use of catheters to deliver energy to the specific areas of the heart that are generating the abnormal electrical signals, thereby disrupting their function.

It is important to consult with a doctor for a proper diagnosis and appropriate treatment plan if you experience frequent or bothersome premature heartbeats. They can evaluate your specific situation, identify any underlying causes, and recommend the most suitable course of action to manage your condition effectively.

Sinus Arrhythmia

While it may seem odd to call an abnormal heart rhythm a sign of a healthy heart, this is actually the case with sinus arrhythmia. Your heart beats at a different rate when you breathe in than when you breathe out and this is said to be normal. In fact, if your heart does not have sinus arrhythmia, it is believed that it is a reason for concern. Having said this, lets know what exactly is sinus arrhythmia.

The sinus node is the heart's natural "pacemaker," which means it is responsible for setting the rhythm of a person's heartbeats. Normal sinus rhythm is the rhythm that originates from the sinus node and represents the characteristic rhythm of the healthy human heart. The rate in normal sinus rhythm is generally regular but vary depending on autonomic inputs into the sinus node. The

normal sinus heart rate is between 60 and 100 beats per minute (bpm). In men, it varies between 43 and 102 bpm and 47 and 103 in women. Likewise, it is higher in infants (i.e., 110-150 bpm) and gradually decreases over the first six years of life. When there is irregularity in the sinus rate, it is termed "Sinus arrhythmia" (or "regularly irregular" sinus rhythm). Typically its presence is an indicator of good cardiovascular health. Sinus Arrhythmia is of two types namely; sinus rhythm faster than the normal range is called a sinus tachycardia, while a sinus rhythm with slower rate is called a sinus bradycardia.

Basically, sinus arrhythmia is defined as a variation of normal sinus rhythm that characteristically presents with an irregular rate in which the change in



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the R-R interval is greater than 0.12 seconds. Additionally, the P waves are typically monomorphic and in a pattern consistent with atrial activation originating from the sinus node. Sinus ar-

rhythmia is a common incidental finding on routine EKG. It is most prevalent in young, healthy patients and is a prognostic indicator of good cardiac health. Sinus arrhythmia does not correlate with a decrease in life expectancy or other comorbidities. Its absence, however, has been associated with chronic diseases such as diabetes mellitus and heart failure. Sinus Arrhythmia occurs during respiratory phase (where the P-P interval lengthens and shortens with inspiration and expiration), non-respiratory phase (where the process occurs seemingly for no reason) or during ventricular phase (the ventricular phase sinus arrhythmia, when present, typically occurs in patients with third-degree heart block).

Since respiratory sinus arrhythmia is normal, people without symptoms

rarely need treatment. Likewise, in individuals with non-respiratory sinus arrhythmia or ventricular phase sinus arrhythmia, generally, don't need any further testing or intervention. However, individuals with third-degree heart block can be fatal and hence these patients should be monitored frequently as it may lead to heart failure or loss of consciousness.

Few best practices to maintain heart health:

- Keep your high blood pressure under control
- Monitor your cholesterol levels regularly
- Maintain healthy body and reduce body weight (if overweight)
- Eat a heart-healthy diet
- Quit smoking
- Exercise regularly