



Ventricular Tachycardia Overview and Treatment Guide



VENTRICULAR TACHYCARDIA

What Causes Ventricular Tachycardia?

Your heart rate is controlled by electrical signals transmitted across the heart muscle. When something goes wrong and signals are sent too rapidly, tachycardia can occur.

Most often, ventricular tachycardia is caused by other heart problems such as coronary artery disease, high blood pressure, an enlarged heart (cardiomyopathy) or heart valve disease. It also can develop after a heart attack (myocardial infarction) or after heart surgery because of scar tissue that forms on the heart.

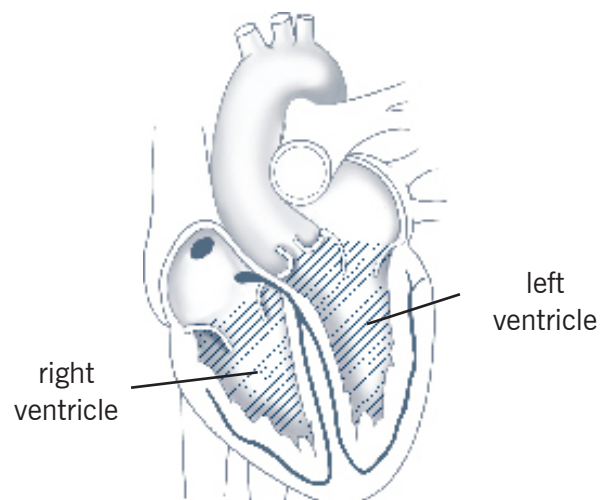
Ventricular tachycardia can develop in people who do not have heart disease, but this is less commonly the case. In these individuals, the condition can be caused by certain medications, an imbalance in electrolytes (the minerals that regulate heart rhythm), excessive caffeine or alcohol consumption, recreational drugs or exercise, or certain genetically transmitted conditions. In others, it occurs in the absence of heart disease or any other clearly identified causes.

Older people and those with a family history of heart rhythm disorders are more likely to develop ventricular tachycardia.

What is Ventricular Tachycardia?

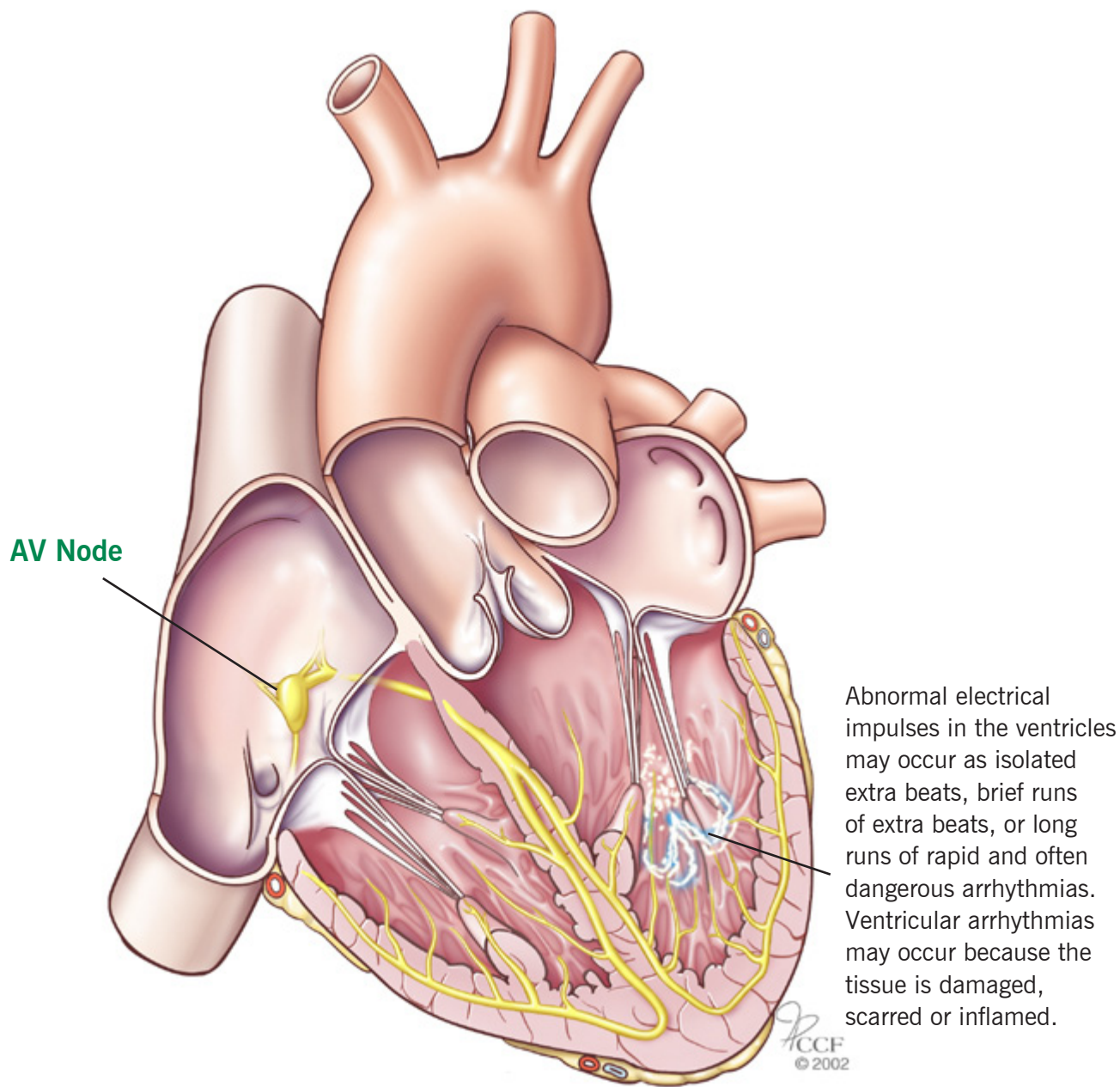
The ventricles are the heart's two lower chambers. They fill with blood from the top chambers of the heart (atria) and send it to the lungs and through the aorta to be circulated throughout the body. Tachycardia is a heart rate of greater than 100 beats per minute. A normal heart rate is 60 to 100 beats per minute at rest. Ventricular tachycardia is a regular, faster-than-normal heart rate that begins in the heart's lower chambers. In most patients with ventricular tachycardia the rate is in the range of 170 beats per minute or more.

The Heart's Ventricles



This information is not intended to replace the medical advice of your doctor or healthcare provider. Please consult your healthcare provider for advice about a specific medical condition.

A Ventricular Arrhythmia Begins In The Lower Chambers Of The Heart



What are the Symptoms?

During an episode of ventricular tachycardia, the heart is beating so fast that the blood pressure drops so the heart cannot pump enough oxygen to every part of the body, and this is what causes symptoms. Although some people with ventricular tachycardia do not experience any symptoms, the most common symptoms are dizziness, lightheadedness, palpitations, shortness of breath or chest pain. When the heart rate is extremely high or the ventricular tachycardia persists for more than a few seconds, it can cause fainting, unconsciousness or cardiac arrest and death.

If you experience unexplained fainting, dizziness, lightheadedness, shortness of breath or palpitations, you should be evaluated for possible ventricular tachycardia. Chest pain, difficulty breathing and a rapid pulse are urgent symptoms of a potentially fatal ventricular tachycardia, and you must seek emergency care immediately to avoid the risk of cardiac arrest and death.

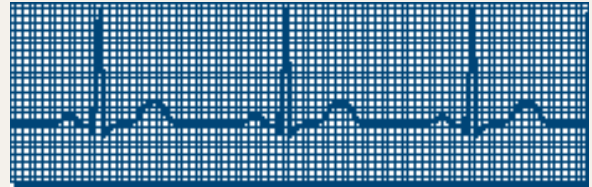
How is Ventricular Tachycardia Diagnosed?

The most common first step in diagnosing ventricular tachycardia is an electrocardiogram (ECG/EKG). An EKG is a device used to record on graph paper the electrical activity of the heart. The picture is drawn by a computer from information supplied by electrodes (small sticky patches) that are placed on your chest and arms to record the heart's rhythm. The doctor will perform an EKG in the office, but you also may need to wear a portable EKG unit (Holter monitor) at home for 24 to 48 hours so the doctor can better evaluate your heart's rhythm.

Another tool to help diagnose ventricular tachycardia is electrophysiology testing. Your doctor may refer you to a specialist to have this procedure done. During the test, catheters with electrodes are inserted through the veins at the groin and placed directly in the heart to study the electrical activity of different regions of the heart. The doctor can then create a map of the heart's electrical impulses and determine precisely where the abnormalities originate.

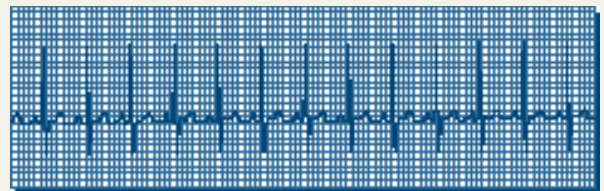
Heart Rhythms on EKG

The heart's electrical system triggers the heartbeat. Each beat of the heart is represented on the electrocardiogram (EKG or ECG) by a wave arm.



Normal Heart Rhythm

The normal heart rhythm (normal sinus rhythm) shows the electrical activity in the heart is following the normal pathway. The rhythm is regular and the rate is normal (about 50 to 100 beats per minute).



Tachycardia: fast heart rhythm
(> 100 beats per minute)

Your doctor will diagnose ventricular tachycardia based on the results from these tests, your clinical signs and symptoms, and medical history.

What Treatments are Available?

The goals of treating ventricular tachycardia are to manage any underlying disease, which may improve or eliminate the abnormal heart rhythm, and prevent future episodes.

In an emergency, the immediate goal is to slow the heart rate to normal. This may involve CPR, electrical defibrillation or giving IV medications.

Most patients with ventricular tachycardia have two treatment options — radiofrequency catheter ablation (RCA) and an implantable cardioverter defibrillator (ICD). Both treatment options are associated with good outcomes when they are performed at a medical center where the doctors are highly experienced in treating patients with ventricular tachycardia.

Radiofrequency Catheter Ablation

Radiofrequency catheter ablation (RCA) is a procedure performed by a cardiac electrophysiologist, which is a cardiologist who focuses on the treatment of heart rhythm disorders. In the first part of the procedure, the physician uses electrophysiology techniques to pinpoint the location in the heart where the abnormal rhythm originates.

In the second step, the physician uses a catheter with a special tip on it that emits a high frequency form of electrical current. The energy is directed at the area in the ventricle where the abnormal current originates to destroy a tiny amount of tissue. This is called an ablation procedure.

Ablation of ventricular tachycardia has a long history of safety and success. For some patients, ablation completely cures the abnormal rhythm, and they require no further treatment. For other patients, ablation enhances the effectiveness of an ICD.

Ablation of Ventricular Tachycardia

Cleveland Clinic is a national referral center for patients with ventricular arrhythmias, performing more than 500 ablation procedures for this condition from 2003 through 2009.

In 2009, Cleveland Clinic physicians performed 95 ablations for ventricular tachycardia and eliminated all tachycardias in 82 percent of those patients. In another 6 percent, the procedure successfully eliminated at least one tachycardia in patients with multiple tachycardias.

Implantable Cardioverter Defibrillator

An implantable cardioverter defibrillator (ICD) is a device that monitors and controls the heart's rhythm to prevent ventricular tachycardia. It is implanted under the skin.

An ICD consists of a pulse generator, which is about the size of a pager, and one or more lead wires that connect the pulse generator with the heart. The leads are inserted through the veins and positioned in the heart. The leads transmit the heart's electrical activity to a computer microchip in the pulse generator. If the computer detects an abnormal heartbeat, the pulse generator sends an electrical signal across the lead(s) to the heart to restore normal heart rhythm.

Clinical studies show that ICDs are effective for nearly all patients in stopping life-threatening ventricular tachycardias.

Medications to slow down the heart rate are another treatment option for patients with ventricular tachycardia. These drugs can be effective but are associated with some serious, potentially fatal side effects, and their use is declining.

The Heart's Electrical System

The atria (the heart's upper chambers) and ventricles (the heart's lower chambers) work together, alternately contracting and relaxing to pump blood through the heart. The electrical system of the heart is the power source that makes this possible. Here's what happens during a normal heartbeat:

Sinoatrial (SA) Node

With each heartbeat, the electrical impulse begins at the SA node, located in the right atrium. The SA node produces the electrical impulses that set the rate and rhythm of the heartbeat. The electrical activity spreads through the walls of the atria and causes them to contract.

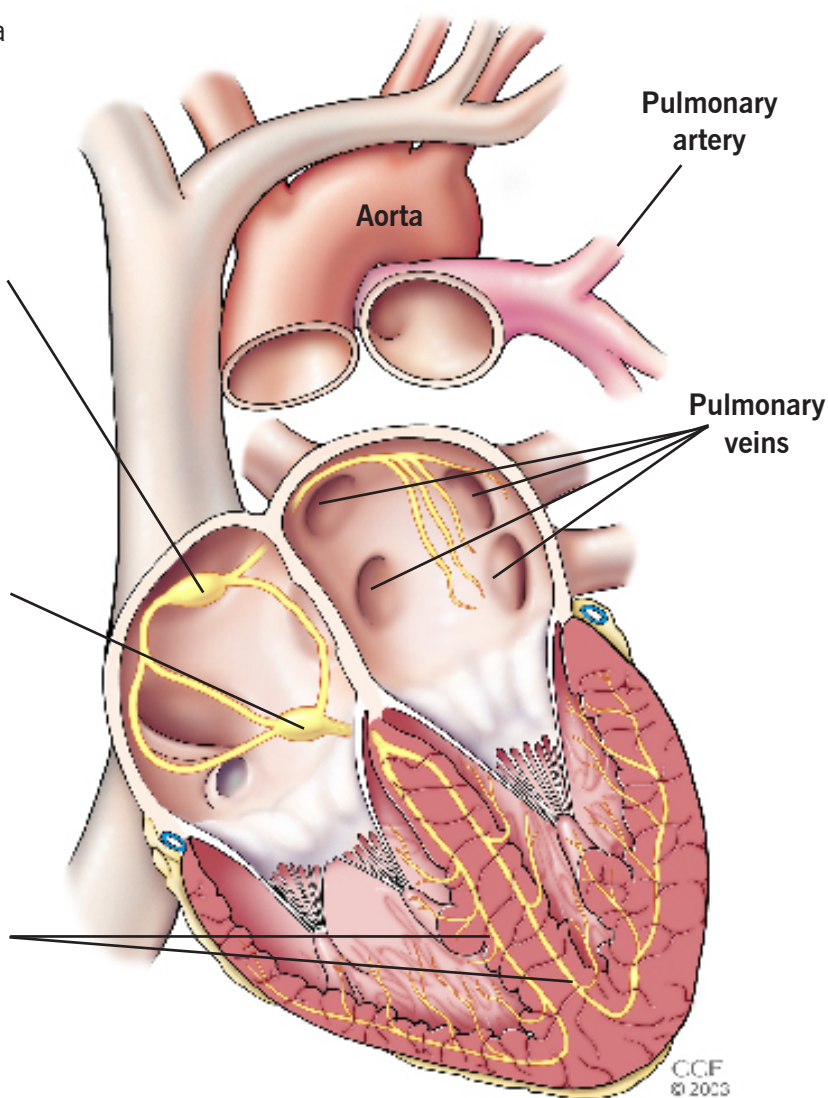
Atrioventricular (AV) Node

The AV node is located between the atria and ventricles and acts like a gate that slows the electrical signal before it enters the ventricles. This delay gives the atria time to contract before the ventricles do.

HIS-Purkinje Network

This pathway of fibers sends the impulse into the muscular walls of the ventricles and causes them to contract. This contraction forces blood out of the heart to the lungs and body.

The SA node fires another impulse and the cycle begins again.



Follow-up Care

If you are under a doctor's care for ventricular tachycardia, it is important that you keep your appointments for regular follow-up visits. Your doctor will want to monitor your condition, make sure the treatment is still effective and discuss any symptoms or other changes in your condition that may occur.

It is important for you to continue to follow a heart healthy diet and exercise plan as recommended by your healthcare team.

For More Information

For more information about ventricular tachycardia and treatment options, please visit our Website at www.clevelandclinic.org/heart or email us using the Contact Us form.

To talk with a nurse about ventricular tachycardia and available treatment options, please contact the Sydell and Arnold Miller Heart & Vascular Institute Resource Center Nurse toll-free at **866.289.6911**.

About the Sydell and Arnold Miller Family Heart & Vascular Institute

The Sydell and Arnold Miller Family Heart & Vascular Institute at Cleveland Clinic is one of the largest cardiovascular specialty groups in the world, providing patients with expert medical management and a full range of therapies. **Our cardiac care program has been ranked number one since 1995** by *U.S. News & World Report*.

Our areas of expertise combine research, education and clinical practice to provide innovative and scientifically based treatments for cardiovascular disease. The commitment of our physicians and scientists to the prevention and cure of cardiovascular disease has led to innovative care, better outcomes and improved quality of life for patients with cardiovascular disease.

To Make an Appointment

To make an appointment, please call **800.223.2273** or **216.444.6697**

International patients, please call Global Patient Services at **001.216.444.8184** to make an appointment, or visit us on the Web at www.clevelandclinic.org/appointments.



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About Cleveland Clinic

Cleveland Clinic, located in Cleveland, Ohio, is a not-for-profit multispecialty academic medical center that integrates clinical and hospital care with research and education. It was founded in 1921 by four renowned physicians with a vision of providing outstanding patient care based upon the principles of cooperation, compassion and innovation. U.S. News & World Report consistently names Cleveland Clinic as one of the nation's best hospitals in its annual "America's Best Hospitals" survey. About 2,100 full-time salaried physicians and researchers and 11,000 nurses represent 120 medical specialties and subspecialties. In addition to its main campus, Cleveland Clinic operates nine regional hospitals and 15 Family Health Centers in Northeast Ohio, Cleveland Clinic Florida, the Lou Ruvo Center for Brain Health in Las Vegas, Cleveland Clinic Canada, and opening in 2012, Cleveland Clinic Abu Dhabi. In 2009, there were more than 4.6 million visits throughout the Cleveland Clinic health system and 170,000 hospital admissions. Patients came for treatment from every state and from more than 100 countries. Visit us at www.clevelandclinic.org.