

Ventricular tachycardia & ventricular fibrillation

Section 1 of 6: The basics

Understand VT and VF, recognize emergencies, and explore treatment and follow-up.

What should I do now?

Call 911

Call 911 for collapse, fainting with racing, chest pressure, severe trouble breathing, or repeated ICD shocks. If someone is unresponsive and not breathing normally, follow the dispatcher's CPR/AED instructions.

Contact your care team

After one ICD shock with complete recovery, contact your device team promptly and follow your personal plan. Report recurrent racing or new symptoms.

Keep your care plan

Keep your treatment and follow-up plan. Bring questions, readings, and your medication list.

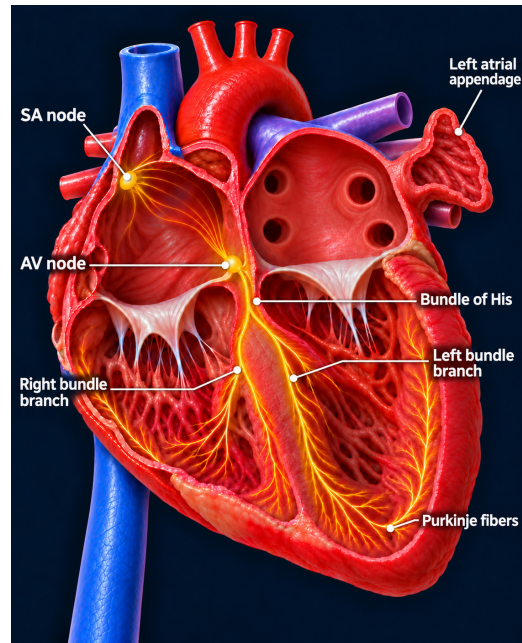
SECTION 1

What are ventricular tachycardia and ventricular fibrillation?

Ventricular tachycardia (VT) and ventricular fibrillation (VF) are abnormal heart rhythms that start in the heart's lower chambers, called the ventricles. These chambers pump blood to your lungs and the rest of your body.

Both rhythms disrupt the heart's normal electrical activity, but they affect the heartbeat differently.

How does the heart normally beat?



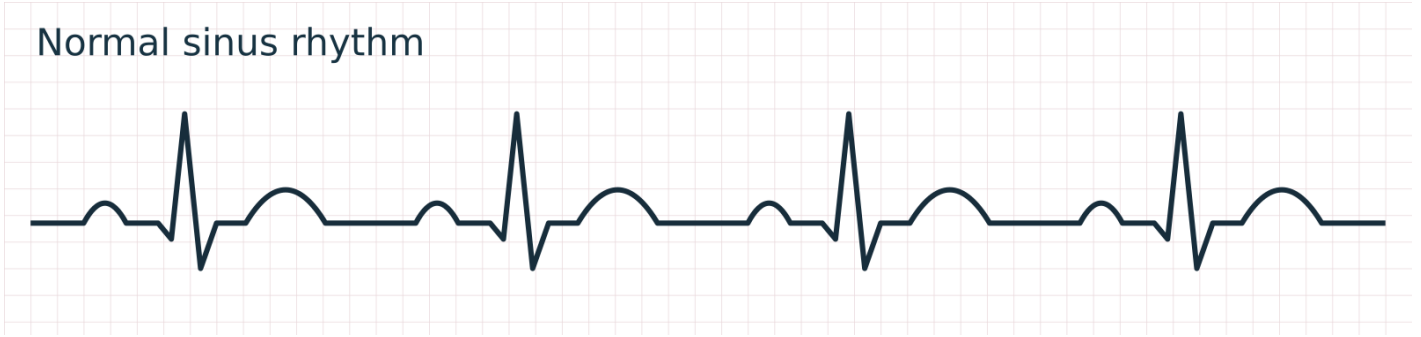
Follow one normal heartbeat

SA node → Atria → AV node → Ventricles

- The SA node starts the signal. The heart's natural pacemaker in the right upper chamber begins each normal sinus beat.
- The signal spreads through both atria. The upper chambers contract, moving blood into the ventricles.
- The AV node briefly delays the signal. This pause gives the ventricles time to finish filling.
- The signal activates the ventricles. It travels through the bundle of His, right and left bundle branches, and Purkinje fibers. The lower chambers contract, pumping blood to the lungs and body.

The atria contract first; the ventricles follow. This organized sequence produces a coordinated heartbeat.

Normal sinus rhythm



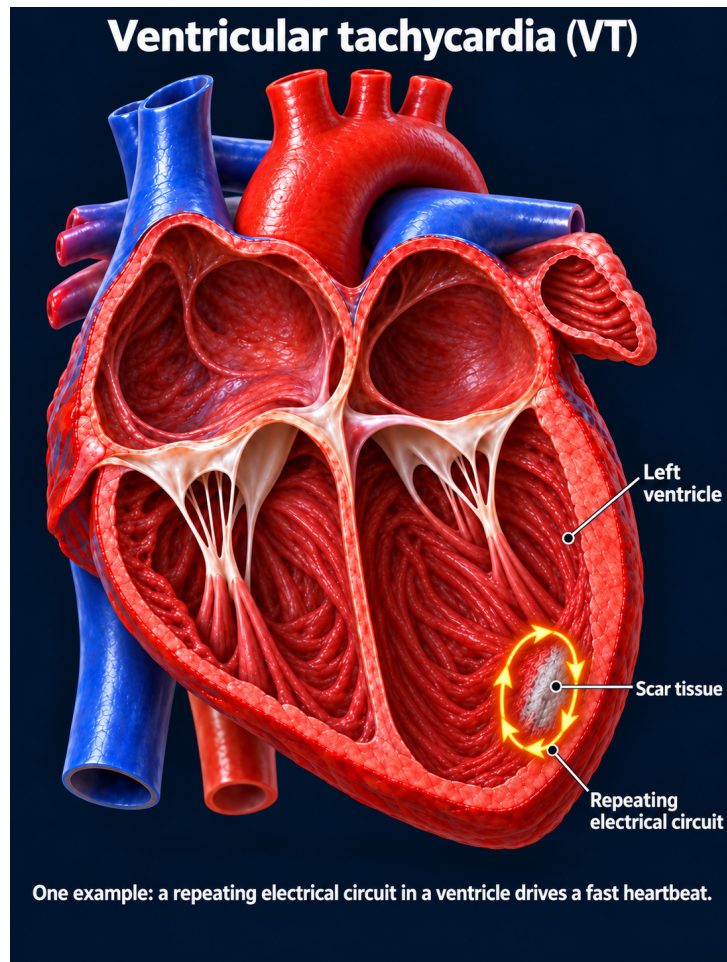
Normal sinus rhythm: An organized electrical signal coordinates the heartbeat. The EKG shows a P wave before each QRS complex and regular spacing between beats. Illustrative tracing; timing and voltage are not calibrated.

What is ventricular tachycardia?

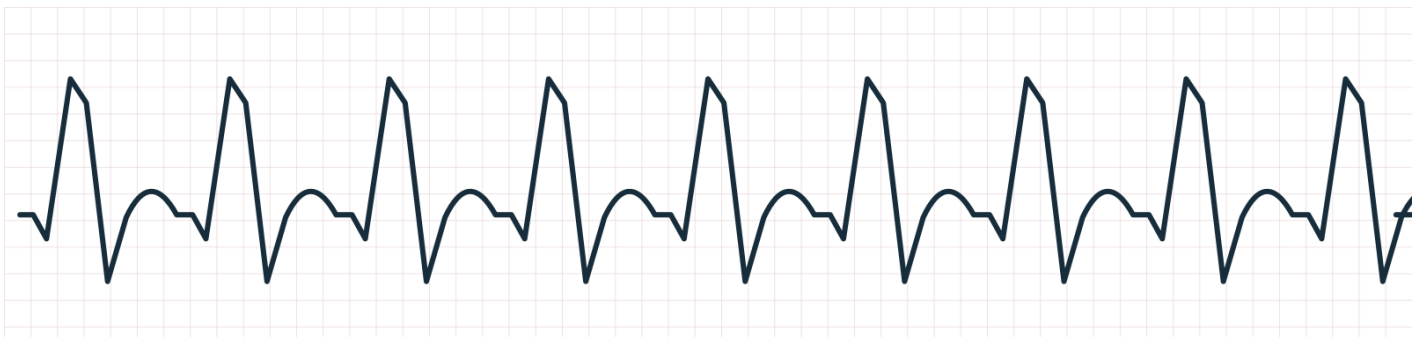
During VT, abnormal electrical signals in the ventricles take over and make the lower chambers beat rapidly. The heart may have less time to fill between beats and may pump less blood to the brain and body.

Some episodes stop on their own after a brief run. Others continue and require treatment to stop them. Doctors call these nonsustained VT and sustained VT.

The seriousness of VT depends on the rhythm, how long it lasts, and the condition of your heart. Some episodes are tolerated, while others cause a dangerous drop in blood pressure, fainting, or cardiac arrest. VT can also deteriorate into VF.



EKG example: monomorphic VT



VT: This example shows a fast, regular rhythm with wide beats that look alike. The heart picture shows one possible cause: electricity circulating around scar tissue.

Illustrative EKG; timing and voltage are not calibrated. Other types of VT can look different.

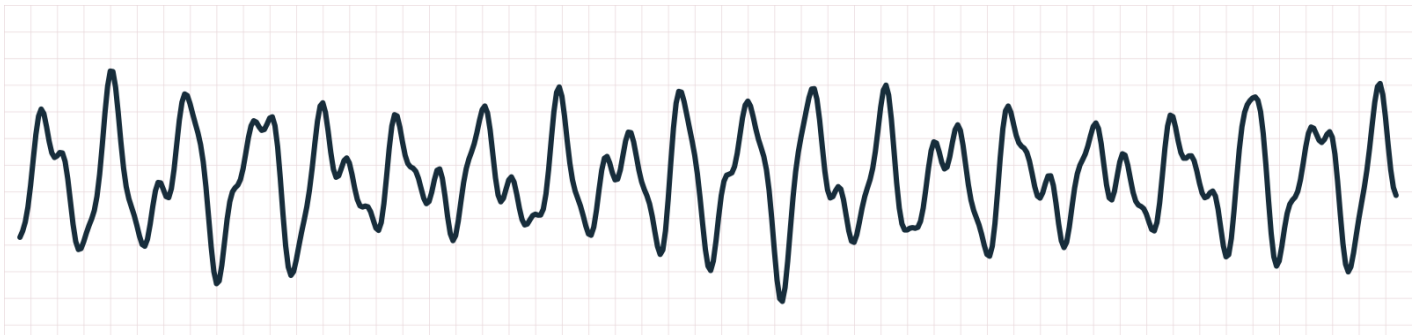
What is ventricular fibrillation?

During VF, electrical activity in the ventricles becomes chaotic. Instead of squeezing together, the lower chambers quiver and cannot pump blood effectively.

VF causes cardiac arrest. Blood flow to the brain and body stops, and the person becomes unconscious. Immediate CPR and a shock from a defibrillator are needed to give the person the best chance of survival.



EKG example: ventricular fibrillation



VF: Chaotic electrical activity produces an irregular tracing without organized beats. The ventricles quiver instead of pumping blood. VF causes cardiac arrest.

Conceptual heart illustration and illustrative EKG; timing and voltage are not calibrated.

How do these rhythms start?

- Scar tissue, such as damage from a previous heart attack.
- A weakened or diseased heart muscle.

- Reduced blood flow to the heart.
- Certain medications or electrolyte imbalances.
- Inherited conditions that affect the heart's electrical system.

Some types of VT can also occur in people without obvious heart muscle damage. Finding the cause helps your care team choose the right treatment.

When is this an emergency?

Call 911 for a racing heartbeat accompanied by chest pain, fainting, severe shortness of breath, or severe dizziness. Do not drive yourself.

If someone collapses, is unresponsive, and is not breathing normally - or is only gasping - call 911, begin CPR, and use an AED as soon as one is available. Follow the dispatcher's instructions and the AED's prompts.

Ventricular tachycardia & ventricular fibrillation

Section 2 of 6: Symptoms

Understand VT and VF, recognize emergencies, and explore treatment and follow-up.

SECTION 2

What symptoms can VT and VF cause?

Symptoms of ventricular tachycardia

During VT, the heart may beat too quickly to pump enough blood to the brain and body. Patients may experience:

- A racing, pounding, or fluttering heartbeat.
- Dizziness or lightheadedness.
- Feeling faint or passing out.
- Shortness of breath.
- Chest pain or pressure.

Some brief episodes cause no noticeable symptoms and are discovered on a heart monitor. Feeling well during an episode does not necessarily mean the rhythm is safe.

What happens during ventricular fibrillation?

VF causes cardiac arrest. The ventricles cannot pump blood effectively, and the person quickly loses consciousness.

Signs include:

- Sudden collapse.

- No response when spoken to or tapped.
- No normal breathing, or only gasping.

There may be little or no warning before the collapse.

When should you call 911?

Call 911 immediately for a racing heartbeat accompanied by chest pain, fainting, severe dizziness, or severe shortness of breath. Do not drive yourself.

If someone collapses, is unresponsive, and is not breathing normally:

- Call 911 and put the phone on speaker.
- Start CPR, following the dispatcher's instructions.
- Use an AED as soon as one is available and follow its prompts.

Do not wait for a watch or home monitor to confirm the rhythm before getting help.

Ventricular tachycardia & ventricular fibrillation

Section 3 of 6: Diagnosis

Understand VT and VF, recognize emergencies, and explore treatment and follow-up.

SECTION 3

How are VT and VF diagnosed?

VT and VF are diagnosed by recording the heart's electrical activity. After identifying the rhythm, your care team evaluates what caused it and how well your heart is working.

An EKG or rhythm strip

An electrocardiogram, called an EKG or ECG, records electrical signals through small stickers placed on your skin.

An EKG obtained during an episode can identify VT. Hospital heart monitors can also capture episodes as they happen.

VF is usually identified on an emergency monitor or defibrillator during cardiac arrest. Emergency treatment begins immediately; it should not be delayed for additional testing.



An EKG records the heart's electrical activity. The recording helps your care team identify the rhythm.

A heart monitor for episodes that come and go

A short office EKG may miss an intermittent rhythm. Your doctor may recommend a Holter monitor, patch monitor, or event monitor to record your heartbeat over a longer period.

Keeping a diary of symptoms and activities helps your care team match what you felt with the recorded rhythm. Selected patients may need a longer-term implanted monitor.



A Holter monitor records your rhythm over a longer period while you go about your usual activities, following your care team's instructions.

Recordings from an implanted device

If you already have an implantable cardioverter-defibrillator (ICD), your device team can review stored electrical recordings to understand an episode and any treatment the device delivered.

Finding the underlying cause

Your doctor may recommend:

- An echocardiogram: An ultrasound that evaluates the heart's structure and pumping function.
- Blood tests: To check electrolytes and other possible contributing problems.

- A cardiac MRI: To look more closely at heart muscle damage or scar tissue.
- Tests of the heart's blood supply: Such as a stress test or coronary angiogram when reduced blood flow or an artery blockage is suspected.
- An electrophysiology study: In selected patients, an EP specialist uses catheters to study the heart's electrical activity.
- Genetic testing: When an inherited heart condition is suspected.

Not every patient needs every test. Your symptoms, rhythm recordings, medical history, and family history guide the evaluation.

Can a watch or home monitor diagnose VT or VF?

A fast pulse reading alone cannot identify which abnormal rhythm is present. Some watches can record an electrical tracing that may help your doctor, but the recording needs professional review.

Do not rely on a watch, blood pressure cuff, or finger oxygen monitor to rule out a dangerous rhythm or decide whether to seek emergency care.

Ventricular tachycardia & ventricular fibrillation

Section 4 of 6: Treatment options

Understand VT and VF, recognize emergencies, and explore treatment and follow-up.

SECTION 4

How are VT and VF treated?

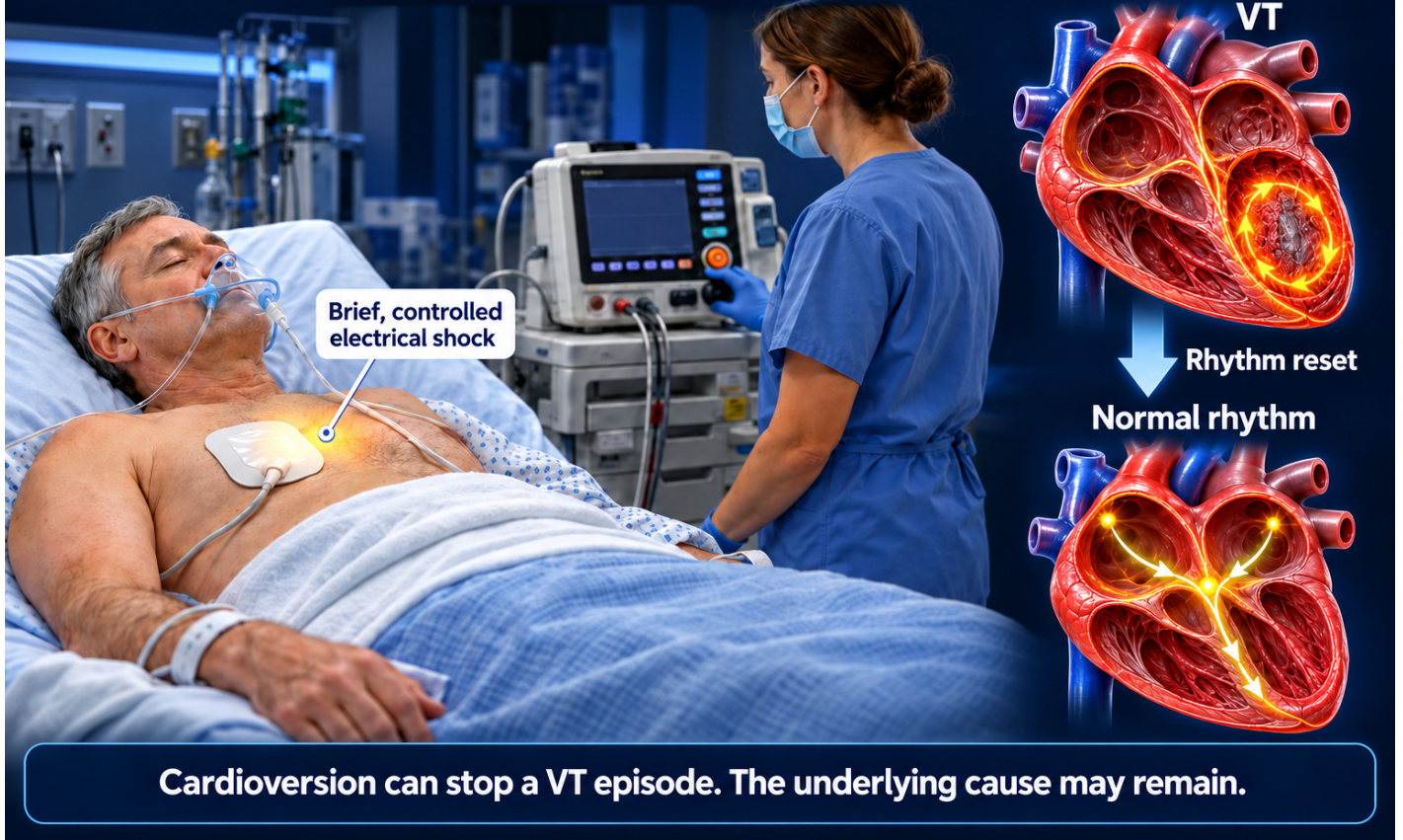
Treatment has three main goals: stop a dangerous episode, reduce the chance of future episodes, and protect against sudden cardiac death.

Your treatment plan depends on the type of rhythm, its cause, your heart's pumping function, and your overall health. Several treatments may be used together.

1. Stopping a dangerous episode

VT with a pulse: If VT causes low blood pressure, fainting, chest pain, or other signs that the heart is not pumping adequately, an electrical shock may be needed immediately. This is called cardioversion. Some patients who are stable can receive medication through an IV under close monitoring.

Cardioversion: resetting the heart rhythm



Cardioversion can stop a VT episode. The underlying electrical problem or heart condition may remain, so additional treatment may be needed.

VF or VT without a pulse: These rhythms cause cardiac arrest and require immediate CPR and defibrillation. A defibrillator delivers a shock to try to restore an organized rhythm.

An electrical shock can stop the episode, but it does not necessarily remove the underlying problem that caused it.

2. Treating the underlying cause

Your care team looks for problems that may trigger or worsen ventricular arrhythmias. Treatment may include:

- Correcting low potassium, magnesium, or other electrolyte problems.
- Treating reduced blood flow to the heart or a heart attack.
- Adjusting medications that may contribute to the rhythm.

- Treating heart failure or another heart muscle condition.
- Providing treatment for an inherited electrical disorder.

Treating the cause is an essential part of reducing future risk.

3. An ICD: protection against dangerous rhythms

An implantable cardioverter-defibrillator (ICD) is a device that continuously watches your heart rhythm.

Depending on the device and rhythm, it may deliver:

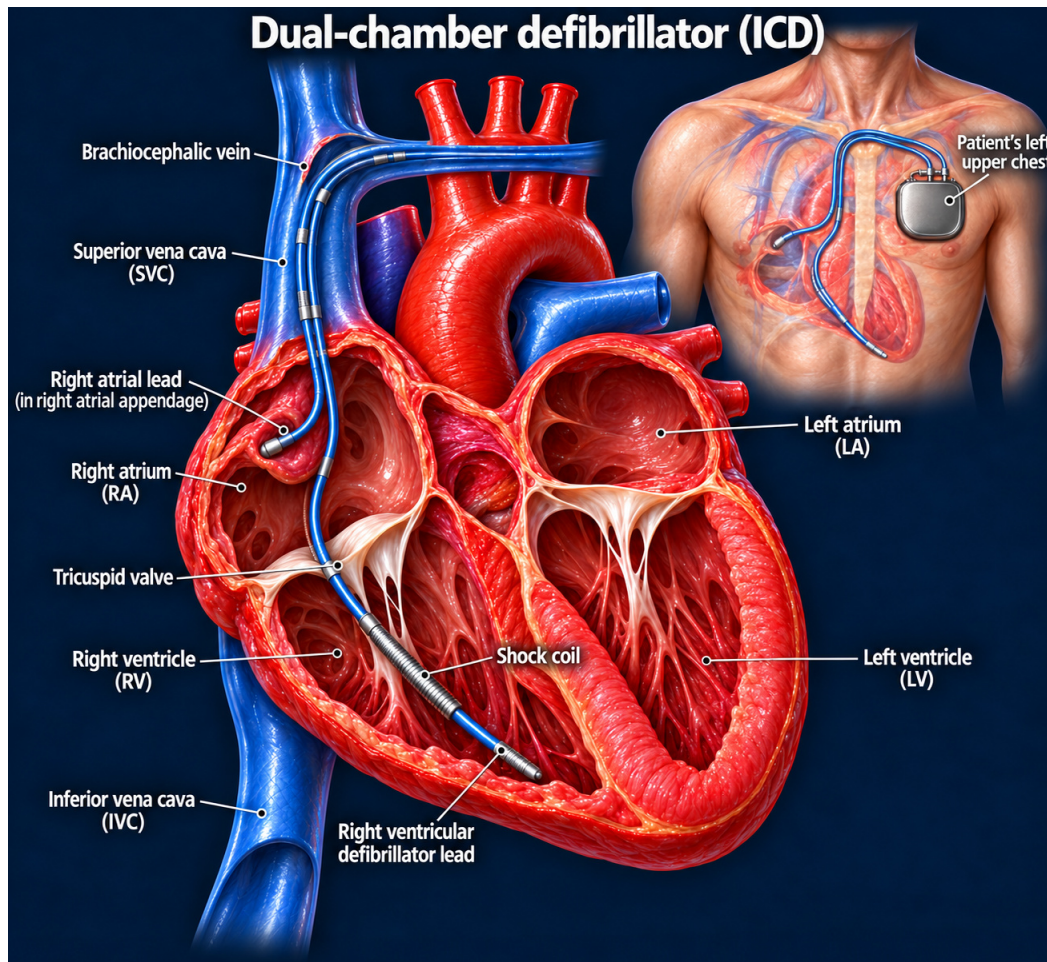
- Antitachycardia pacing: A short series of fast pacing impulses that can interrupt certain VT episodes.
- An electrical shock: To stop a dangerous rhythm such as VF or VT that cannot be stopped with pacing.

An ICD treats dangerous episodes when they occur. It does not remove scar tissue or prevent every episode from starting. Medications or ablation may still be needed.

Not everyone with a brief run of VT needs an ICD. Your doctor considers your heart function, the cause of the rhythm, previous episodes, and whether a reversible problem was responsible.

Dual-chamber defibrillator

A dual-chamber ICD has one lead in the right atrium and one in the right ventricle. The ventricular lead includes a shock coil that allows the device to deliver defibrillation therapy.

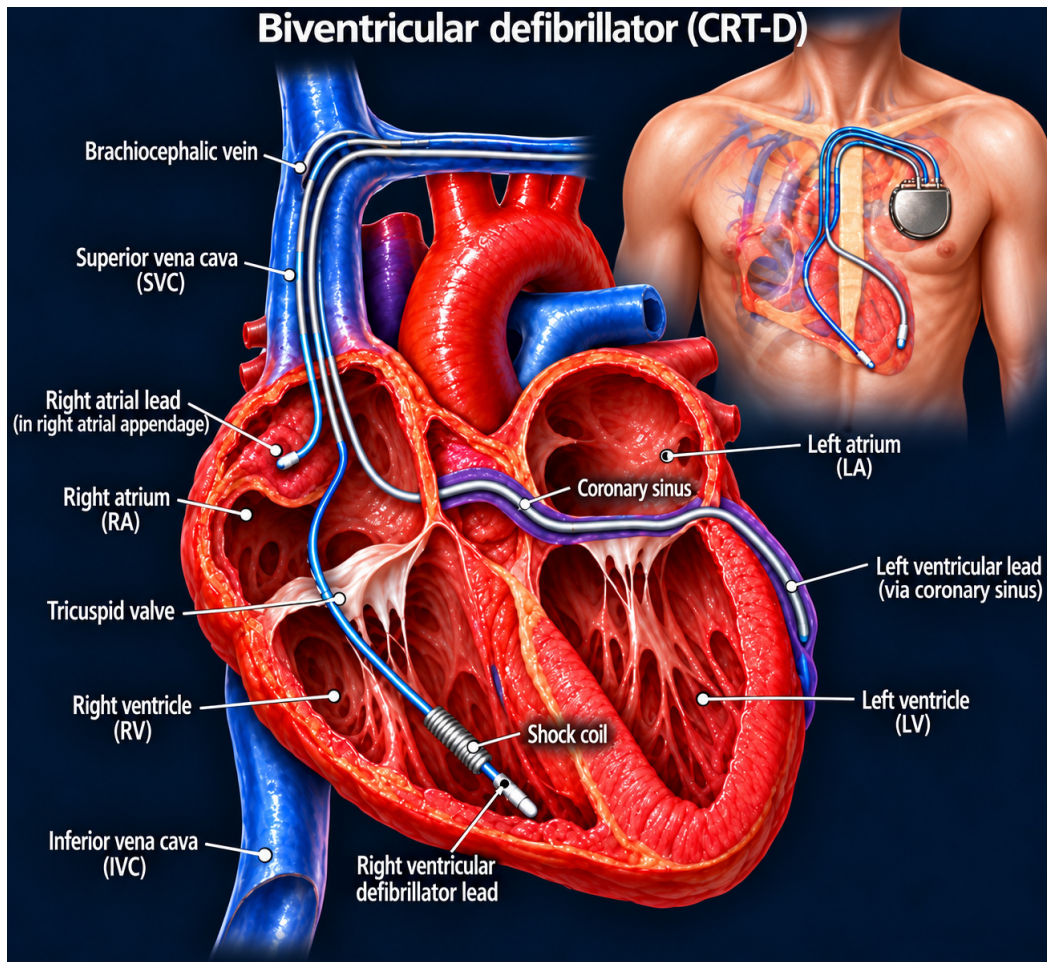


Dual-chamber ICD: One atrial lead and one ventricular defibrillator lead. The device can provide pacing and treat dangerous ventricular rhythms.

Biventricular defibrillator (CRT-D)

A CRT-D combines defibrillator protection with pacing that helps the ventricles squeeze together in selected patients with heart failure.

This example has three leads: one in the right atrium, one in the right ventricle, and a third that travels through the coronary sinus to pace the outside of the left ventricle.



CRT-D: Defibrillator protection plus coordinated ventricular pacing. The additional coronary sinus lead helps pace the left ventricle.

These are two examples of ICD systems. Your physician recommends the type that best fits your rhythm, pacing needs, heart function, anatomy, and overall health.

A wearable defibrillator vest (LifeVest)

Some patients need temporary protection from dangerous VT or VF while their heart function is reassessed or their care team decides on long-term treatment. Your doctor may prescribe a wearable cardioverter-defibrillator, often called a LifeVest.

The vest is worn directly against your skin, underneath clothing, with a portable monitor. It watches your heart rhythm and can automatically deliver a shock for certain life-threatening fast rhythms.



Wearable defibrillator vest

Temporary protection
for selected patients
at risk of VT or VF

Wearable defibrillator vest: Temporary protection for selected patients at risk of VT or VF. Illustration of a wearable system; appearance varies by model.

Protection depends on wearing the device as directed. Follow your device team's instructions for wear time, alarms, bathing, and battery changes. The vest treats dangerous episodes; it does not cure the underlying heart condition. Your physician determines whether you need ongoing protection with an implanted ICD.

4. Medications to reduce episodes

Beta-blockers and, in selected patients, antiarrhythmic medications can reduce ventricular arrhythmias.

These medications must be taken as prescribed. Each has potential side effects, and some require follow-up EKGs, blood tests, or other monitoring.

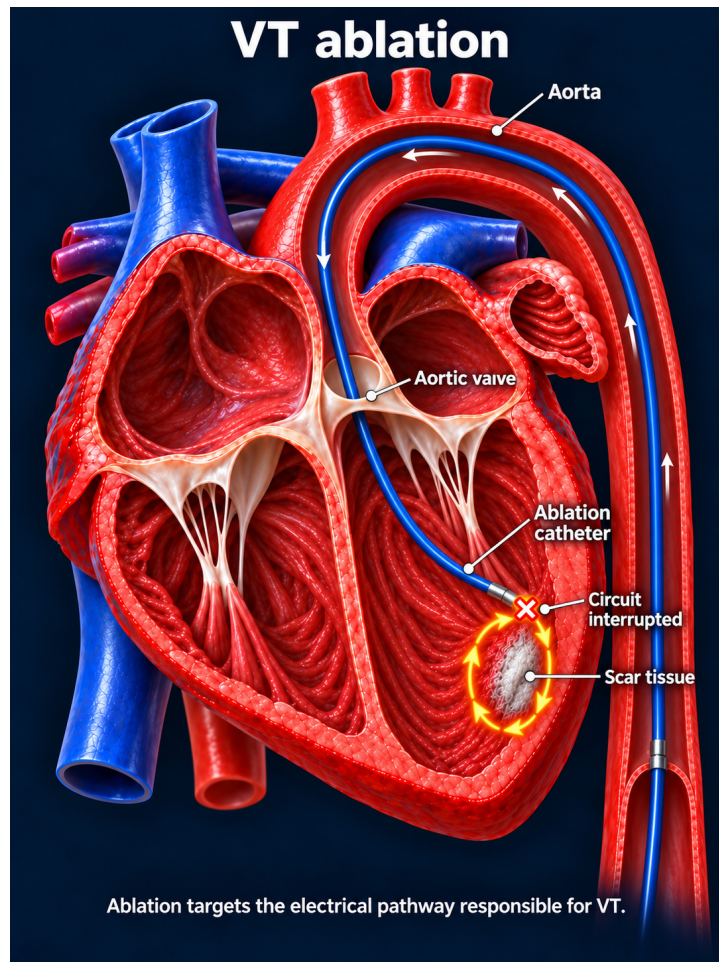
Medication can help suppress episodes, but it does not replace an ICD when an ICD is needed for protection against sudden death.

5. Catheter ablation

During catheter ablation, an electrophysiologist uses thin catheters and an electrical map to locate the tissue responsible for the abnormal rhythm.

For scar-related VT, ablation targets electrical pathways within or around the scar to interrupt the repeating circuit. For VT arising from an abnormal electrical focus, ablation targets that source.

The goal is to reduce VT episodes, symptoms, and ICD treatments - including shocks. Some patients need more than one procedure, and medications or an ICD may still be needed afterward.



One approach to VT ablation: The catheter travels through an artery and the aorta, then crosses the aortic valve into the left ventricle. Ablation targets the electrical pathway responsible for VT. The access route and treatment sites depend on the patient's anatomy and rhythm.

In selected patients with recurrent VF, ablation can target a premature ventricular beat, or PVC, that repeatedly triggers VF. This is a specialized treatment rather than an option for every patient with VF.

Ventricular tachycardia & ventricular fibrillation

Section 5 of 6: Living with your condition

Understand VT and VF, recognize emergencies, and explore treatment and follow-up.

SECTION 5

Living with VT or VF

Many patients return to meaningful, active lives after treatment. Your long-term plan depends on what caused the rhythm, your heart's condition, and the treatments you need.

Stay connected with your care team

Continue follow-up with your cardiologist and electrophysiologist (EP). Feeling better does not necessarily mean the underlying electrical problem has disappeared.

Take medications as prescribed and keep appointments for any recommended blood tests, EKGs, and heart imaging.

If you have an ICD

Your device team checks the battery, leads, settings, and stored rhythm recordings. Keep your remote monitor connected and follow instructions for sending transmissions.

Remote monitoring does not replace emergency care.

Carry your device identification card and tell healthcare professionals that you have an ICD before tests or procedures.

Returning to activity and driving

Ask your care team when you can resume exercise, work, sports, and driving. Restrictions depend on your rhythm, symptoms, treatment, and recovery.

After fainting, cardiac arrest, or an ICD shock, do not resume driving until your care team has reviewed the event and cleared you. Having an ICD does not automatically make driving safe.

What should you do after an ICD shock?

- One shock and you feel well afterward: Contact your device team promptly, preferably the same day, and follow your personal shock plan.
- Repeated shocks, or a shock with chest pain, fainting, severe dizziness, or severe shortness of breath: Call 911. Do not drive yourself.

Your team reviews the device recording to determine what happened and whether medications, device settings, or ablation need to change.

Emotional recovery matters

Fear of another episode or shock is common. Tell your care team about anxiety, poor sleep, or difficulty returning to daily life. Counseling, support groups, and rehabilitation may help.

Your emotional recovery is part of your heart care.

Ventricular tachycardia & ventricular fibrillation

Section 6 of 6: Your next steps

Understand VT and VF, recognize emergencies, and explore treatment and follow-up.

SECTION 6

Your follow-up plan and next steps

Your treatment plan should answer three questions: What caused my rhythm? How will we reduce future episodes? How will we protect me if another dangerous episode occurs?

Prepare for your visit

Bring:

- An updated medication list, including supplements.
- A record of symptoms, fainting episodes, or ICD shocks.
- Your device identification card, if you have one.
- Any outside hospital records or rhythm recordings.
- Your questions - and a family member or support person if helpful.

Questions to ask your cardiologist or EP

- Did I have VT, VF, or both?
- What caused the rhythm, and was any part of the cause reversible?
- How well is my heart pumping?
- Do I need an ICD? Which type fits my needs?
- What will my medications do, and what monitoring do they require?

- Could ablation reduce my episodes or ICD shocks?
- Would I still need medication or an ICD after ablation?
- When can I return to driving, exercise, and work?
- Should my relatives be evaluated for an inherited heart condition?

Leave with a clear plan

Before leaving, make sure you know:

- When your next appointment and any testing are scheduled.
- How to contact your cardiology and device teams.
- What to do after an ICD shock.
- Which symptoms require a call to the clinic and which require 911.
- How to use your remote monitor, if prescribed.

Ask for these instructions in writing and share them with the people closest to you.

Help your family prepare

Family members should know how to recognize cardiac arrest, call 911, begin CPR, and use an AED.

If someone is unresponsive and is not breathing normally - or is only gasping - call 911, start CPR, and use an AED as soon as one is available.

Sources & further reading

NHLBI: How the heart beats

MedlinePlus: Cardiac conduction system

AHA: Fast heart rhythms

AHA: Ventricular fibrillation

NIH: Diagnosing arrhythmias

NIH: Cardiac arrest treatment

NIH: How defibrillators work

HRS: Ventricular arrhythmia ablation consensus

NIH: Living with an ICD

AHA: Living with an ICD

Updated October 2026. Educational information; your own care plan may differ. Heart illustrations and EKG examples are simplified for teaching.

ZOLL: Wearable defibrillator patient questions