CONDITION

Ventricular fibrillation

Ventricular fibrillation is a chaotic heart rhythm that suddenly stops the heart from pumping blood.

WHAT IT IS
Chaotic rhythm that stops effective heart pumping

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Sudden collapse, unconsciousness, no pulse, abnormal breathing

WHAT CAUSES IT
Heart damage, electrical disorders, medicines, or electrolyte problems

HOW IT IS DIAGNOSED
Heart rhythm tracing during the event

MAIN TREATMENT
Immediate CPR, defibrillation, and advanced resuscitation care

CAN IT BE CURED?
Sometimes - when a correctable trigger is removed

IS IT AN EMERGENCY?
Yes - every suspected episode

LONG-TERM OUTLOOK
Often poor when CPR and defibrillation are delayed

Overview

Ventricular fibrillation, often shortened to VF or V-fib, is a life-threatening heart rhythm. It begins in the ventricles, the two lower chambers of the heart.

During VF, electrical signals fire rapidly and chaotically. Instead of squeezing and pumping blood, the ventricles quiver. Blood flow to the brain and other organs stops, causing cardiac arrest.

A person with VF usually becomes unconscious within seconds. Without cardiopulmonary resuscitation, known as CPR, and a defibrillator shock, the condition is usually fatal. A defibrillator gives a controlled electrical shock that may allow the heart to return to an effective rhythm.

Cardiac arrest is not the same as a heart attack. Cardiac arrest means the heart has stopped pumping blood effectively. A heart attack happens when blood flow through an artery supplying the heart is blocked. A heart attack can damage the heart and trigger VF, but VF can also have other causes.

VF itself is a sudden event rather than a long-term rhythm that someone remains conscious with. Longer-term care focuses on recovery, finding the cause, and reducing the chance that it will happen again.

Symptoms

VF does not usually cause a long period of symptoms. Its main signs appear suddenly because blood is no longer reaching the brain.

A person experiencing VF will typically:

Occasional gasping is called agonal breathing. It is not normal breathing and should not delay CPR or use of an automated external defibrillator, or AED.

Some people have warning symptoms before cardiac arrest. These may include chest discomfort, a racing or pounding heartbeat, shortness of breath, dizziness, nausea, or fainting. However, VF can also happen without warning.

These symptoms do not prove that someone has VF. Many other conditions can cause them. VF can only be confirmed by recording the heart's electrical rhythm during the event.

- Collapse and become unresponsive
- Have no detectable pulse
- Stop breathing normally
- Gasp, snort, or take occasional irregular breaths

Causes and risk factors

VF happens when the electrical system controlling the ventricles becomes severely disrupted. The trigger may be temporary, or it may come from lasting heart damage or an inherited electrical condition.

Coronary artery disease is an important underlying cause. In this condition, the arteries supplying the heart become narrowed or blocked. VF may occur during a heart attack or because an older heart attack has left scar tissue that disrupts electrical signals.

Other possible causes include:

Some people are born with gene changes that affect the heart's electrical channels or muscle. These changes can raise the risk of dangerous rhythms even when the heart looks structurally normal.

Risk is also higher in people who have previously had VF, another type of cardiac arrest, or sustained ventricular tachycardia. Ventricular tachycardia is a very fast rhythm from the lower heart chambers that can develop into VF.

Sometimes no cause is found despite careful testing. This may be described as idiopathic VF, meaning VF without an identified cause.

- Cardiomyopathy, a condition that weakens or changes the heart muscle
- Heart failure or significant structural heart disease
- Myocarditis, which is inflammation of the heart muscle
- Very low or high levels of electrolytes such as potassium
- Severe lack of oxygen, major blood loss, or shock
- Certain medicines, recreational drugs, or toxic exposures
- An electrical injury
- A forceful blow to the chest at a vulnerable moment in the heartbeat
- Inherited electrical conditions, such as long QT syndrome or Brugada syndrome

Diagnosis

VF is diagnosed from an electrocardiogram, or ECG, recorded during the event. An ECG measures the heart's electrical activity. Ambulance cardiac monitors and AEDs can also recognize whether the rhythm is suitable for a defibrillator shock.

The tracing in VF shows disorganized electrical activity without normal coordinated heartbeats. Because cardiac arrest rhythms can change during resuscitation, information stored by an AED or monitor can help confirm what happened.

After circulation has returned, tests focus on finding the cause and assessing any effects on the body. These may include:

Doctors may also review the circumstances of the collapse, previous fainting or palpitations, medicines, drug exposure, and family history. If an inherited cause is found or strongly suspected, close biological relatives may be offered specialist assessment.

- Blood tests for electrolytes, heart muscle injury, medicines, or toxins
- A 12-lead ECG to look for heart damage or an electrical disorder
- An echocardiogram, which uses ultrasound to examine the heart
- Coronary angiography to look for blocked heart arteries
- Cardiac MRI to assess the heart muscle and scar tissue
- Genetic testing when an inherited condition is suspected

Treatment and management

VF requires immediate resuscitation. The first priorities are calling emergency services, starting CPR, and using an AED as soon as one is available.

Chest compressions move a limited amount of blood to the brain and heart while waiting for defibrillation. An AED checks the rhythm and gives a shock only when it detects a rhythm that may respond. Voice prompts guide the user through the process.

Defibrillation briefly interrupts the chaotic electrical activity. This may allow the heart's natural electrical system to regain control. CPR should continue as directed until the person shows signs of life or emergency professionals take over.

Ambulance and hospital teams may provide repeated rhythm checks, defibrillator shocks, medicines, airway support, oxygen, and treatment for reversible causes. For example, they may correct a severe electrolyte disturbance or restore blood flow through a blocked coronary artery.

After the heartbeat returns, care may continue in an intensive care or cardiac unit. Treatment supports the brain, heart, lungs, kidneys, and other organs while the medical team investigates the cause. Some people need controlled temperature management and careful control of oxygen, blood pressure, and seizures.

Longer-term treatment is based on why VF occurred. It may involve treatment for coronary artery disease, heart failure, or an inherited rhythm condition. Medicines may reduce the risk of further abnormal rhythms, but they do not replace emergency defibrillation during VF.

Many survivors are assessed for an implantable cardioverter-defibrillator, or ICD. This device is placed under the skin and connected to the heart. It monitors the rhythm and can deliver treatment if a dangerous ventricular rhythm returns. An ICD may not be needed when VF had a clearly reversible cause that has been fully corrected.

Catheter ablation may help selected people with repeated ventricular arrhythmias. During this

procedure, thin tubes are passed through blood vessels to the heart so that tissue triggering or supporting the rhythm can be treated.

Medicines commonly used for this include amiodarone . Which one suits you, if any, is a decision for you and your doctor.

Complications

The main danger from VF is death caused by the sudden loss of circulation. The chance of survival falls when recognition, CPR, or defibrillation is delayed.

Even when circulation is restored, reduced blood flow can injure the brain and other organs. The outcome is influenced by how long circulation was interrupted, how quickly CPR began, the cause of VF, and the person's health before the event.

Possible complications include:

These effects range from mild and temporary to lasting. Rehabilitation can address physical weakness, thinking problems, emotional health, and return to everyday activities.

- Memory, concentration, movement, or speech difficulties
- Seizures or more severe brain injury
- Damage to the heart, kidneys, liver, or lungs
- Rib or chest injuries related to CPR
- Another episode of ventricular arrhythmia
- Anxiety, low mood, or fear of recurrence

Prevention

Not every episode of VF can be prevented. It may be the first sign of an inherited electrical condition, and some cardiac arrests have no identifiable warning or cause.

Risk can sometimes be reduced by treating the underlying heart condition. This may include care for coronary artery disease, heart failure, cardiomyopathy, or an abnormal electrolyte level. Taking prescribed heart medicines as directed and attending follow-up appointments can help manage known risks.

People with an ICD need regular device checks. An ICD cannot prevent every abnormal rhythm from starting, but it can detect and treat some dangerous rhythms quickly.

If VF was linked to a medicine, drug, or toxic exposure, the medical team may recommend

avoiding that trigger. Medicines should not be stopped or changed without advice, because sudden changes can also be harmful.

When an inherited condition is diagnosed, it cannot be prevented. Specialist care can help reduce risk, and relatives may benefit from assessment because they could carry the same condition.

Public access to AEDs and CPR training do not prevent VF, but they improve the chance of effective treatment when cardiac arrest occurs.

Living with it and what to expect

VF does not continue as a stable long-term rhythm. A person either receives successful resuscitation or dies during the event. For survivors, the course over the following months and years depends on the cause, time without effective circulation, and any resulting organ injury.

Some people recover well and return to many previous activities. Others need prolonged rehabilitation or ongoing help with memory, movement, fatigue, or daily tasks. Recovery after brain injury may continue for months, but the amount of improvement cannot be predicted with certainty.

Follow-up usually involves a cardiology team. Care may include checking heart function, reviewing medicines, monitoring an ICD, and assessing for recurrent symptoms. Cardiac rehabilitation can support safe physical activity, confidence, and management of heart risk factors.

Driving restrictions often apply after VF or ICD treatment. The exact rules differ by location and by whether the event had a reversible cause. The cardiology team can explain when driving may be resumed under local regulations.

Fear of another cardiac arrest is common for survivors and families. Some people also experience sleep problems, anxiety, depression, or symptoms related to the trauma of the event. Psychological support, rehabilitation, and clear information about an ICD or emergency plan can help.

When to get medical help

Call emergency services immediately if someone suddenly collapses, is unresponsive, or is not breathing normally. Begin CPR and send someone to get an AED if one is available. Follow the AED prompts and continue until emergency professionals take over or the person begins to show clear signs of life.

Do not assume that gasping means the person is breathing normally. Do not delay CPR while trying to find a pulse if you are not trained to do so.

Someone who has survived VF should seek emergency help for fainting, severe chest discomfort, major breathing difficulty, repeated ICD shocks, or an ICD shock followed by ongoing symptoms. A single ICD shock without continuing symptoms still requires prompt contact according to the person's device-care plan.

New palpitations, dizziness, near-fainting, medicine side effects, or changes around an ICD site should be discussed promptly with the healthcare team. Routine cardiology and device appointments remain important even when the person feels well.

Common questions

Is ventricular fibrillation the same as a heart attack?

No. VF is an electrical problem that stops the heart from pumping. A heart attack is caused by blocked blood flow to part of the heart muscle. A heart attack can trigger VF.

Can you be awake during ventricular fibrillation?

Usually only for a few seconds, if at all. Because VF stops effective blood flow to the brain, consciousness is lost very quickly.

Can the heart restart by itself after ventricular fibrillation?

VF rarely ends in a stable, effective rhythm without treatment. Immediate CPR supports circulation, while defibrillation provides the main chance of stopping the chaotic rhythm.

Can an AED hurt someone who does not have ventricular fibrillation?

An AED analyzes the heart rhythm before advising or delivering a shock. It will not give a shock unless it detects a rhythm that meets its programmed criteria. Using an AED on an unresponsive person who is not breathing normally is appropriate.

Can ventricular fibrillation happen again?

Yes. Recurrence risk is influenced by the cause and whether it can be corrected. An ICD, medicines, procedures, or treatment of underlying heart disease may reduce or manage this risk.

Is ventricular fibrillation hereditary?

VF itself is not always inherited. However, inherited rhythm disorders and heart muscle conditions can increase the risk. Genetic assessment may be considered when the event happened without a clear acquired cause or when there is a concerning family history.

Sources

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