



Heart Rhythm SocietySM



SUDDEN CARDIAC ARREST

OPTIONS FOR TREATMENT

**Think
Sudden Cardiac Arrest
is a Heart Attack?**



**That's like comparing
apples and oranges.**

www.HRSONline.org/SCA

WHAT IS SCA?

Sudden Cardiac Arrest (SCA) is when the heart stops functioning suddenly and without warning. It occurs because electrical pulses that tell the heart when to pump blood become rapid or chaotic. This causes the heart to stop pumping blood to the brain and vital organs, which in most cases leads to death. But there is a lot you can do to help prevent SCA. Read on to learn more about SCA and how to keep your heart healthy.

SCA AND HEART ATTACK

SCA is not a heart attack. Seventy percent of Americans don't know the difference between SCA and a heart attack. Heart attack occurs when a blockage prevents oxygen-rich blood from moving through the arteries to the heart. SCA is an electrical problem in the heart that causes the heart to stop pumping blood. Heart attack has symptoms, such as chest pain and difficulty breathing, and some warning signs. But SCA may have no symptoms and occurs without warning. Patients who have had a heart attack, or a previous cardiac event, are at the greatest known risk of SCA.

SURVIVING SCA

Since SCA causes the heart to stop pumping blood, blood does not get to the brain. This leads to loss of consciousness and can cause death within minutes if the heart doesn't receive either an internal or external shock to get it pumping again. An internal shock comes from a device surgically implanted in the chest called an ICD. An external shock comes from an automated external defibrillator (AED). The problem with AEDs is that they have to be operated by a person, which means that one has to be brought to you in time. In most cases, this isn't likely to occur. **So the best treatment for SCA is prevention.** This might mean changes in your lifestyle or having an ICD placed in your chest. It often means both.

This booklet is not intended as a substitute for professional medical care. Only your doctor can diagnose and treat a medical problem.

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ARE YOU AT RISK?

SCA can happen to a person of any age, race, or gender. In fact, it can even happen to young athletes who seem in excellent physical condition. So even if you feel healthy you could still be at risk.

RISK FACTORS

Talk to your healthcare provider about whether you should see a doctor who specializes in heart rhythm problems (electrophysiologist). Electrophysiologists have additional education and training in the diagnosis and treatment of abnormal heart rhythms. You may need to have your heart tested if you have any of the following risk factors:

- Family history of heart attack, heart disease, or cardiac death
- Unexplained fainting or near fainting or palpitations
- Chest pain, shortness of breath or fainting with exertion—such as during sports
- Heart failure or heart attack
- Weak heart muscle, or a cardiac “ejection fraction” of less than 35%
- Cardiac risk factors, such as high blood pressure, diabetes, obesity, or abnormal cholesterol

EJECTION FRACTION

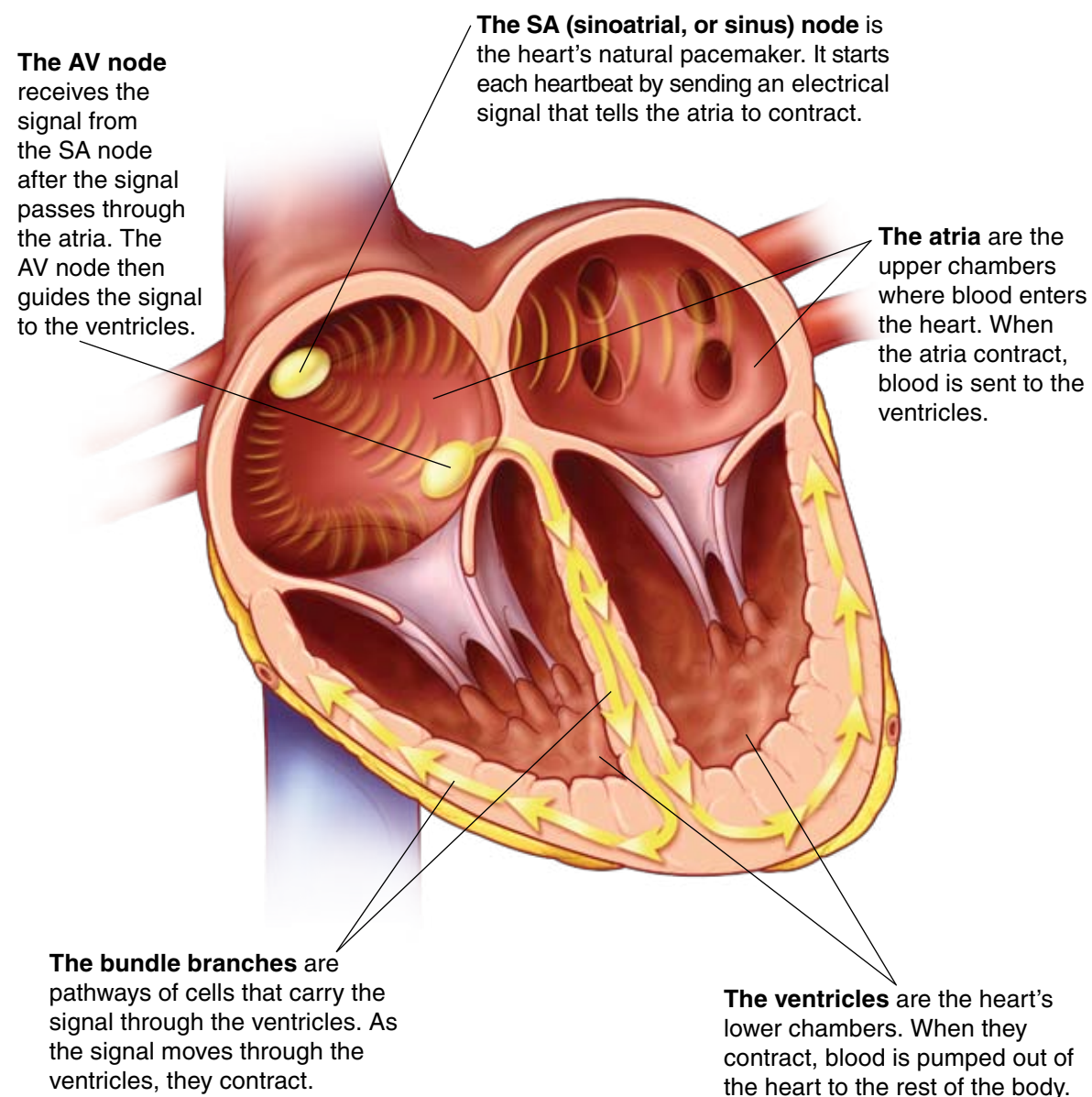
Your healthcare provider may check your ejection fraction number. This is the percentage of blood that is pumped out to the body from the filled ventricle in your heart. A normal ejection fraction is in the 50–75% range. A lower number means a greater risk of SCA. Your ejection fraction can be determined by a number of tests. The one most commonly used is called an echocardiogram (see page 6).

A NORMAL HEART RHYTHM

Your heart is a muscle that pumps blood throughout your body. The heart muscle beats (contracts and relaxes) many times a minute. The speed and pattern at which the heart beats is known as your heart rhythm. Signals from the heart's electrical system control this rhythm. A problem with these signals may cause an abnormal heart rhythm.

YOUR HEART'S ELECTRICAL SYSTEM

Groups of special electrical cells called **nodes** create or send electrical signals through the heart. As the electrical signals pass through the heart muscle they cause the muscle to contract, pumping the blood forward through the heart and out to the rest of the body. The signals start in the right atrium in the **SA node**. They then travel through the atria and to the **AV node**. The AV node passes the signals to the ventricles along special pathways called **bundle branches**.

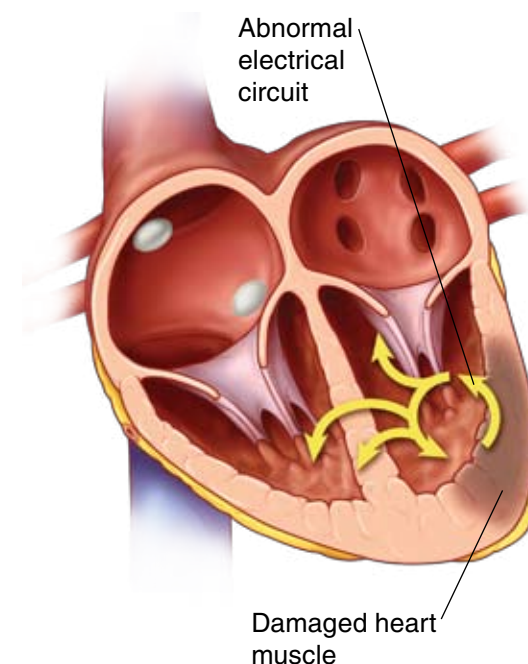


ABNORMAL RHYTHMS

Your heart's rhythm can be too fast, too slow, or irregular. For most people with a healthy heart these abnormal rhythms do not last. But for others, they can lead to severe complications. These abnormal rhythms are called **arrhythmias**. Some types of arrhythmia can cause sudden cardiac arrest, the most common of which is ventricular fibrillation.

VENTRICULAR TACHYCARDIA (VT) AND VENTRICULAR FIBRILLATION (VF)

The ventricles do most of the work to pump blood to the body. So, fast rhythms in the ventricles are often more serious than those in the atria. With VT, abnormal electrical activity or circuits develop in the ventricles. This usually occurs in areas of damaged heart muscle or cells. VT makes the heart beat very fast, causing the heart to pump ineffectively. It can develop into the most serious arrhythmia, called ventricular fibrillation (VF). VF is a chaotic, fast, irregular rhythm. This causes the heart to pump little to no blood.



OTHER CAUSES OF SCA

Life-threatening arrhythmias tend to develop in people with other heart conditions. The most common of these conditions are:

- **Coronary artery disease**, which occurs when the artery wall is damaged by things like abnormal blood cholesterol or smoking. Plaque (a fatty material) builds up in the damaged wall. This is called atherosclerosis. The buildup reduces blood flow to the heart and can eventually block blood from reaching the heart, causing a heart attack. Most people who suffer sudden cardiac arrest also have coronary heart disease.
- **Heart attack**, which can cause areas of the heart to develop scar tissue. This scar tissue can alter the electrical system in your heart and cause abnormalities that lead to SCA.
- **Cardiomyopathy**, a disease of the heart muscle that may make it weak, thickened, or scarred.
- **Heart failure**, which occurs when the heart can't pump as much blood as it should. This means some parts of the body don't get enough blood. Heart failure occurs when the heart has been weakened, often by other heart conditions, such as those listed above.



DIAGNOSING SCA

Your healthcare provider may decide that you are at risk of SCA. If so, he or she may request that you have one or more tests done on your heart. These tests can be done in a doctor's office or at a hospital and will help your healthcare provider find out what, if anything, is wrong with your heart, and what you can do to prevent complications.

TESTS AND EXAMS

- **An electrocardiogram (ECG or EKG)** records the way electrical signals travel through your heart. Small pads (electrodes) are placed on your chest, arms, and legs. Wires connect the pads to the ECG machine, which records your heart's signals. This can show the pattern of your heartbeat and detect abnormalities.
- **An echocardiogram** uses ultrasound waves to show the structure and movement of your heart muscle. This shows how well the heart pumps. It also shows if the heart is enlarged, the thickness of the heart's walls, and any valve problems.
- **Holter monitoring** can help detect an abnormal heartbeat. A portable monitor is connected to your chest with soft pads. The monitor records changes to your heart's rhythm over several hours or days.
- **An event recorder** is similar to a Holter monitor, but instead of recording your every heartbeat for long periods, it only records the most current 30 seconds of heart rhythm. When you experience a symptom, however, you will be able to choose to store the 30 seconds of rhythm around the symptom by pressing a button.
- **An EP study** is a procedure that gives information about your heart's electrical system. During the procedure, thin tubes (catheters) are inserted into a blood vessel and carefully guided into your heart with the help of x-rays. The electrical activity and the electrical pathways in your heart are then recorded and mapped out.
- **Cardiac catheterization** helps detect clogged blood vessels. X-ray dye is injected into the heart through a catheter (thin tube). Then, an angiogram (special type of x-ray) is taken of the blood vessels. Cardiac catheterization can also show problems with pumping, heart chambers, blood flow, or valves.

LIVING HEALTHY

After being diagnosed and treated for heart problems, some people may make the mistake of thinking that everything is okay because they feel better. But the sooner you accept your condition the better. Understand that unless you make some changes in your life, you are at high risk of more problems. At first, it may be hard for you to face making lifestyle changes. But having your family and friends work with you can help make these changes easier.

STAYING ACTIVE

Regular exercise will make your heart and coronary arteries healthier. It helps increase strength, lower blood pressure, and relieve stress. It also helps you control your weight. Your doctor will prescribe an exercise program that's best for you. In the meantime, try these tips:

- Plan activities like a walk around the block. If the weather is bad, try walking indoors, such as at a shopping mall. Light gardening and swimming are other options that may work for you. Talk to your healthcare provider about safe choices.
- Involve family and friends in your activities. You can enjoy yourself and help your heart at the same time!
- Stay aware of your limits. Stop and rest if you feel tired or short of breath. If you can't hold a conversation during activity, you're pushing yourself too hard.

EATING RIGHT

Making some changes in your eating habits can help reduce your risk of heart disease.

- Cut down on fat. Eating less fat, especially saturated fats, can improve your cholesterol levels, which is a major risk factor for coronary artery disease.
- Eat more fruits and vegetables.
- Limit salt. Salt can raise blood pressure and over time can cause the heart to work harder. This contributes to heart disease.
- Limit or avoid alcohol. Excessive alcohol consumption can lead to stroke, arrhythmia, and SCA.

MEDICATIONS

Your healthcare provider may prescribe medication to help control arrhythmia or other conditions that could lead to SCA. Some medications improve the way your heart pumps over time. Others may help to relieve symptoms of cardiovascular disease. Either way, it is very important to take your medications as directed. These medications might include

- ACE inhibitors
- Angiotensin receptor blockers (ARB)
- Beta-blockers
- Statins

TREATING SCA

If you're found to be at high risk of SCA, your healthcare provider may advise you to get an Implantable Cardioverter Defibrillator (ICD). An ICD is a device that is placed under the skin in your chest. It treats SCA by monitoring your heart rhythm and sending out electronic signals to disrupt dangerously fast rhythms that may lead to SCA. Although your healthcare provider may prescribe other treatments, an ICD is the most effective. Ask your healthcare provider about the benefits and burdens of a device.

WHAT THE DEVICE LOOKS LIKE

This ICD is shown slightly smaller than actual size.

The **generator** is a smooth, lightweight metal case containing a tiny computer and a battery. The case is often made of titanium. The generator sends out electrical impulses.

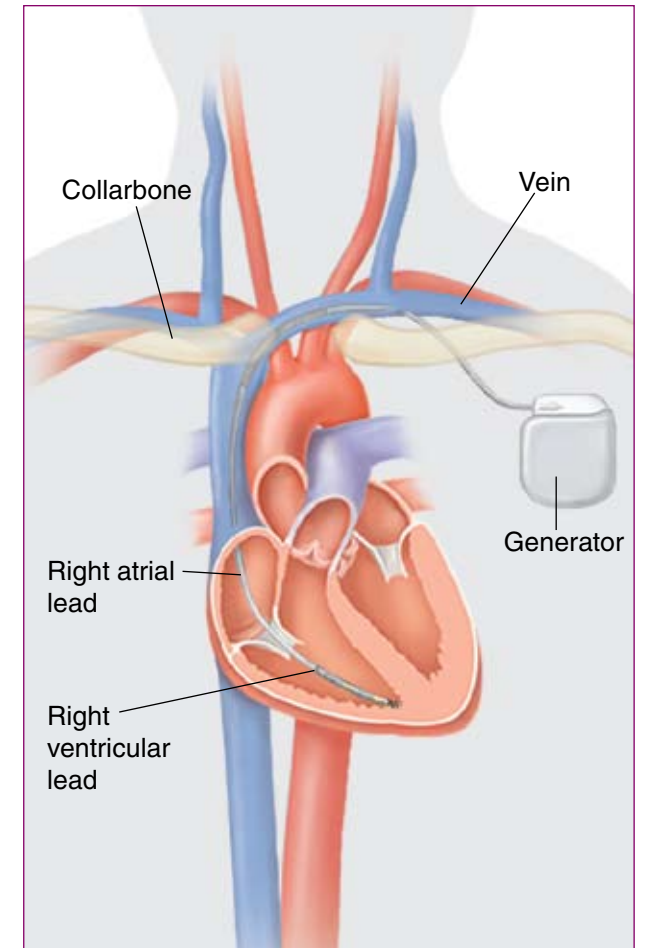
The **lead** is a wire covered by a soft, flexible material. The lead carries electrical impulses from the generator to the heart.



HOW THE DEVICE IS PUT INTO THE BODY

The device is placed in your body during a process called **implantation**. Here's how it's done:

- First, you'll receive medications to prevent pain and help you relax or sleep.
- An incision is made in the skin below the collarbone. This creates a small "pocket" to hold the device.
- A lead is threaded through the incision into a vein in the upper chest. With the help of x-ray monitors, the lead is then guided into one of the heart's chambers. Depending on how many leads your ICD has, this process may be repeated to guide leads into other chambers.
- The leads are attached to the heart muscle so they will stay in place.
- The generator is attached to the leads. Then, the generator is placed in its pocket under the skin.
- A fast heart rhythm may be induced (started) to test the ICD.
- When everything is done, the incision is closed with sutures, medical glue, or staples.



OTHER TREATMENTS

Your healthcare provide may prescribe treatments in addition to an ICD. These might include:

- **Catheter ablation** destroys (**ablates**) an abnormal electrical pathway or group of electrical cells that may be causing an arrhythmia. During the procedure, an **ablating electrode catheter** is placed in the heart. Radio frequency waves (or another form of energy) are then sent through the catheter to destroy the abnormal pathway or cells.
- **Medications**, such as ACE inhibitors, beta-blockers, and calcium channel blockers may be prescribed to help control your heart's rhythm.



COPING WITH SCA

When you have been told you're at high risk of SCA, it's normal to feel sad or down at times. People who've survived SCA can feel this way, too. After all, your life has undergone a lot of changes, and sometimes following a treatment plan presents difficult challenges, such as trying to rebuild intimacy with a loved one. If you feel overwhelmed, just focus on one day at a time. And don't be afraid to ask others for help when you need it.

WAYS TO FEEL BETTER

Try not to withdraw from family and friends, even if you are finding it hard to talk with them. They can still be a good source of support. To feel better, you can also:

- Spend time doing things you enjoy. This may include participating in a favorite hobby, meditating, praying, or spending time with people you care about.
- Share what you learn about your condition with the people in your life. Invite family members along when you visit your healthcare provider.
- Think about joining an SCA or ICD support group. It may be easier to talk to people who know firsthand what you're going through. They can offer advice and share stories. You may want to ask loved ones to join you for a meeting.

ASKING FOR HELP

Consider talking to your healthcare provider or a therapist if:

- You feel worthless or helpless, or are thinking about suicide. These are warning signs of depression. Treatment can help you feel better. When depression is under control, your overall health may also improve.
- You feel anxious about what will happen to you or your loved ones if your health gets worse. Taking care of legal arrangements, such as a living will and durable power of attorney, can help you feel more secure about your and your loved ones' futures. Have an advance care plan in place.

TIPS FOR REDUCING STRESS

With change comes stress. Changes in diet, activity, and intimacy with a loved one can all be stressors and have harmful effects on your heart. The good news is that there are many ways to keep stress under control. Try some of these:

- Get enough sleep. A well-rested body is less likely to react to every little problem. Talk to your healthcare provider if you have trouble sleeping.
- Exercise regularly. This helps you handle stress better and sleep more soundly.
- Learn to let things go. Remember that everyone makes mistakes—even you.
- Learn relaxation techniques such as deep breathing. To deep breathe, sit or stand with your hands on your stomach. Breathe in slowly through your nose. Feel your stomach expand. Breathe out slowly through pursed lips. Repeat several times.

REBUILDING INTIMACY

Dealing with SCA, you may have no desire for sex. This is normal. But your interest and desire for sex are likely to return. Still, don't push yourself into sex before you are ready. Having sex is only one part of being intimate. You can build up to sex by expressing your love in other ways.

- Talk honestly with your partner about your feelings. This helps build closeness.
- Try hugging, kissing, touching, or caressing at first. This may help you both feel close and wanted.
- When you feel ready for sex, focus on giving each other pleasure. Foreplay and mutual stimulation can be good ways to ease back into being intimate.





STAYING COMMITTED

Having a healthier heart takes long-term commitment. Plan small, realistic goals. Tackle them one at a time. Search for information about heart disease and lifestyle changes. And get support from support groups.



Heart Rhythm SocietySM

Restoring the Rhythm of Life

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