

Sudden Cardiac Arrest Fact Sheet

What is sudden cardiac arrest (SCA)?

SCA is a serious, life-threatening medical emergency that happens abruptly and without warning. During SCA, the heart's electrical system malfunctions, and it is no longer able to pump blood to the rest of the body. The lack of blood to the brain causes the person to lose consciousness quickly. If the person does not receive immediate treatment with defibrillation, brain damage and death can occur.¹ The chances of surviving SCA decrease by 7-10 percent with every minute that passes without a life-saving shock. Few attempts at resuscitation succeed after 10 minutes.² In more than 90 percent of victims, death occurs.³

What causes SCA?

SCA is usually caused by a problem with the heart's electrical system, resulting from coronary artery disease, a heart attack or other heart problems.

When the electrical signals in a heart are abnormal, this can cause an irregular heart rhythm called an arrhythmia. An arrhythmia may cause the heart to beat too fast, too slow or with an irregular rhythm. If the heart rate becomes very fast, unstable and irregular, it may become a dangerous rhythm called ventricular fibrillation (VF). With VF, the heart quivers rapidly and cannot pump blood throughout the body. This causes most SCAs.^{4,5}

What are the risk factors of SCA?

SCA can strike people of any age, gender, race, and even those who seem in good health. Factors increasing the risk for SCA include:^{6,7}

- Personal or family history of coronary heart disease, arrhythmias, or SCA
- Previous heart attack, heart failure or heart defect
- High blood pressure
- High cholesterol
- Obesity
- Diabetes
- Sedentary lifestyle
- Smoking
- Drug or alcohol abuse
- Age

Sudden Cardiac Arrest vs. Heart Attack

- SCA is an **electrical problem**, caused by an arrhythmia that prevents the heart from pumping blood to the brain and vital organs. The patient is unconscious and not breathing.^{4,5}
- A heart attack is a **plumbing problem** caused by one or more blockages in the heart's blood vessels, preventing proper flow. Part of the heart muscle dies. The patient is awake and breathing.^{4,5}

What are the symptoms of SCA?

The first sign of SCA is loss of consciousness, with no heartbeat. While there are often no warning signs, some of these symptoms may occur before SCA:⁸

- Fatigue or weakness
- Shortness of breath
- Fainting
- Dizziness or lightheadedness
- Heart palpitations
- Chest pain

How is SCA diagnosed?

SCA is diagnosed after the event and may appear as ventricular fibrillation on an electrocardiogram (ECG).

For those who may be at risk for SCA, a doctor may suggest one or more of the following tests, which will help determine the best treatment plan:⁹

- **Electrocardiogram (EKG):** The EKG senses and records heartbeats to show how a heart's electrical system is working.
- **Echocardiogram (Echo):** The Echo uses ultrasound to create images of a heart as it beats, to help a doctor learn about the shape and size of the heart, how well the heart valves are working, and the amount of blood pumped with each heart beat (called the ejection fraction).
- **Electrophysiology (EP) study:** The EP study involves checking how electrical impulses travel through the heart muscle to help find out about abnormal heart rhythms.

How is SCA treated?

Those at risk for SCA might be treated with medications. However, medications alone have not proven to be very effective in reducing the risk of SCA.¹⁰ Another treatment option is a pacemaker-like device called an implantable cardioverter defibrillator (ICD), which may prevent sudden cardiac death.¹¹ ICD therapy has been shown to effectively stop 95 percent or more of dangerously fast heart rhythms.¹²

Sudden Cardiac Arrest Survival

- SCA kills more than **300,000 people** each year in the United States.³
- Only **1 in 11** people usually survives SCA; the other 10 die before reaching the hospital.³
- With an ICD device, **19 out of 20** people will survive SCA.¹²

Once SCA occurs, cardiopulmonary resuscitation (CPR) and defibrillation are required within the first several minutes to restore electrical activity to the heart and revive the heart's pumping function.^{13,14}

- **Cardiopulmonary Resuscitation (CPR):** CPR involves chest compressions with assisted breathing (30:2 ratio). This is an important step to allow external defibrillation therapy to be effective.¹⁵
- **Defibrillation:** This is a strong electrical shock to the heart to stop the arrhythmia and restore a normal heartbeat. There are two types – automated external defibrillators (AEDs) use paddles to deliver a shock to the outside of the body, and ICDs are implanted pacemaker-like devices that can sense arrhythmias and deliver life-saving shocks.¹⁶

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1 National Heart, Lung, and Blood Institute. What is Sudden Cardiac Arrest? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda>. Accessed May 18, 2015.

2 American Heart Association. What Is an Automated External Defibrillator? http://www.heart.org/idc/groups/heart-public/@wcm/@hcm/documents/downloadable/ucm_300340.pdf. Accessed May 18, 2015.

3 American Heart Association. Cardiac Arrest Statistics. http://www.heart.org/HEARTORG/General/Cardiac-Arrest-Statistics_UCM_448311_Article.jsp. Accessed May 18, 2015.

4 National Heart, Lung, and Blood Institute. What is Sudden Cardiac Arrest? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda>. Accessed May 18, 2015.

5 National Heart, Lung, and Blood Institute. What Causes Sudden Cardiac Arrest? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda/causes>. Accessed May 18, 2015.

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- 6 National Heart, Lung, and Blood Institute. Who Is at Risk for Sudden Cardiac Arrest? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda/atrisk>. Accessed May 18, 2015.
 - 7 National Heart, Lung, and Blood Institute. How Can Death Due to Sudden Cardiac Arrest Be Prevented? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda/prevention>. Accessed May 18, 2015.
 - 8 National Heart, Lung, and Blood Institute. What Are the Signs and Symptoms of Sudden Cardiac Arrest? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda/signs>. Accessed May 18, 2015.
 - 9 National Heart, Lung, and Blood Institute. How Is Sudden Cardiac Arrest Diagnosed? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda/diagnosis>. Accessed May 18, 2015.
 - 10 Huikuri H, et al. Sudden death due to cardiac arrhythmias. *NEJM*. 2001;345:1473.
 - 11 Huikuri H, et al. Sudden death due to cardiac arrhythmias. *NEJM*. 2001;345:1473.
 - 12 Himmrich E, et al. Is ICD programming for double intraoperative defibrillation threshold energy safe and effective during long-time follow-up? Results of a prospective randomized multicenter study (Low-Energy ENDOTAK Trial - LEFT). *Z Kardiol*. 1999;88:103-12 [German language edition].
 - 13 National Heart, Lung, and Blood Institute. How Is Sudden Cardiac Arrest Treated? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda/treatment>. Accessed May 18, 2015.
 - 14 National Heart, Lung, and Blood Institute. How Can Death Due to Sudden Cardiac Arrest Be Prevented? <http://www.nhlbi.nih.gov/health/health-topics/topics/scda/prevention>. Accessed May 18, 2015.
 - 15 National Institute of Health – Medline Plus. CPR – adult. <http://www.nlm.nih.gov/medlineplus/ency/article/000013.htm>. Accessed May 18, 2015.
 - 16 Huikuri H, et al. Sudden death due to cardiac arrhythmias. *NEJM*. 2001;345:1473.