



SUDDEN CARDIAC ARREST:

Definition, Causes, and Epidemiology

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What is Sudden Cardiac Arrest?

Sudden Cardiac Arrest (SCA) occurs when the heart suddenly stops pumping. It can happen to people with or without known heart disease and can lead to death if not promptly managed.¹

Sudden Cardiac Arrest vs. Heart Attack: What's the Difference?

Although they may seem similar, SCA is not the same thing as a myocardial infarction, or “heart attack.”

A heart attack occurs when a blockage interrupts blood flow to the heart, leading to intense chest pain and death of heart muscle if not corrected.

In sudden cardiac arrest, the heart develops a dangerous abnormal rhythm that prevents it from pumping blood effectively. Without immediate CPR and defibrillation, death can occur within minutes.¹

What Are the Consequences of Sudden Cardiac Arrest?

SCA can be extremely deadly, as it often happens to people unaware of their increased risk. One study estimates that an SCA outside of a hospital only has a survival rate of about 10% when intervention is not taken.¹ Electrical defibrillation, or shocks, with an automated external defibrillator (AED) is vital for survival when used in conjunction with CPR in the setting of an SCA.²

What Causes Sudden Cardiac Arrest?

The causes of sudden cardiac arrest vary depending on a person's age. In adults older than 35 years, sudden cardiac arrest is most commonly caused by coronary artery disease (CAD), in which plaque buildup narrows the arteries that supply blood to the heart. CAD can reduce blood flow to the heart muscle and trigger dangerous heart rhythms that lead to cardiac arrest.^{4,5}

In children, adolescents, and adults younger than 35 years, sudden cardiac arrest is more commonly caused by electrical or structural problems of the heart.⁶ These conditions are especially dangerous because they may not cause symptoms until a life-threatening event occurs. Common causes include:

- **Hypertrophic cardiomyopathy (HCM)**, a condition that causes abnormal thickening of the heart muscle
- **Anomalous coronary arteries**, in which the arteries supplying the heart develop abnormally
- **Myocarditis**, inflammation of the heart muscle, often following a viral infection
- **Arrhythmogenic and other inherited cardiomyopathies**, which weaken or scar the heart muscle
- **Long QT syndrome**, an inherited electrical disorder that can trigger dangerous heart rhythms
- **Brugada syndrome**, a genetic condition affecting the heart's electrical system
- **Catecholaminergic polymorphic ventricular tachycardia (CPVT)**, an inherited rhythm disorder often triggered by exercise or emotional stress
- **Commotio cordis**, a rare event in which a sudden blow to the chest during sports causes cardiac arrest despite a structurally normal heart

Because many of these structural and electrical heart conditions can be present without obvious symptoms, awareness, appropriate screening, and early identification are critical. This is particularly important for young athletes, as strenuous physical activity may trigger a cardiac event in individuals with an underlying heart condition.⁴

How Common is Sudden Cardiac Arrest?

Although exact numbers are not known, it is expected to be a major cause of death in the United States. SCA may be responsible for 15-20% of all deaths in adults, affecting over 350,000 individuals every year.⁵ Some groups may be more at risk of SCA than others. Men are three-to-four times more likely to have an SCA than women.⁵ Race may also be a factor, with African Americans having increased rates of SCA compared to



other groups, though this may be multifactorial, with socioeconomic factors playing a role.⁵ In the pediatric population, SCA is much less common, occurring in approximately 1-2 per 100,000 children annually.⁶ Among children, the incidence is highest during the first five years of life and is more common in males.^{6,7}

What Are the Risk Factors for Sudden Cardiac Arrest? How Do I Prevent It?

The best way to reduce the risk of sudden cardiac arrest depends on its underlying cause. In adults older than 35 years, the greatest risk factor is a heart attack from underlying coronary artery disease (CAD). Managing cardiovascular risk factors - including high blood pressure, high cholesterol, diabetes, smoking, obesity, and physical inactivity - can help lower the risk of CAD and, in turn, sudden cardiac arrest.⁵⁻⁸ Maintaining a heart-healthy lifestyle by eating a balanced diet, exercising regularly, avoiding tobacco, and maintaining a healthy body weight are important preventive measures.⁸

In children, adolescents, and adults younger than 35 years, sudden cardiac arrest is more often caused by electrical or structural problems of the heart rather than coronary artery disease.⁶ Because these conditions may not cause symptoms before a cardiac event, prevention focuses on early recognition and evaluation. Individuals with symptoms such as unexplained fainting, chest pain during exercise, palpitations, or unexplained seizures, or those with a family history of cardiomyopathy, inherited arrhythmias, or sudden cardiac death, should undergo medical evaluation. Appropriate screening, diagnosis, and treatment of these conditions, along with individualized guidance regarding sports participation when indicated, can help reduce the risk of sudden cardiac arrest.^{4,6}

How Is Sudden Cardiac Arrest Treated?

Sudden cardiac arrest is a medical emergency that requires immediate action. Every minute that passes without treatment significantly decreases the chance of survival. If someone suddenly collapses, is unresponsive, and is not breathing normally, bystanders should immediately call 911 and begin CPR.^{1,2}

The most effective treatment for many cases of SCA is rapid defibrillation using an automated external defibrillator (AED). An AED analyzes the heart's rhythm and can deliver a lifesaving shock to restore a normal heartbeat when needed. These devices are designed to be used by anyone, even without medical training, and provide step-by-step voice instructions.^{1,2}

Early CPR helps keep oxygen-rich blood flowing to the brain and other vital organs until an AED can be used. When CPR and defibrillation are provided quickly, survival rates increase dramatically.^{1,2}

For this reason, it is important for families, schools, sports teams, workplaces, and community organizations to know where the nearest AED is located before an emergency happens. AEDs are commonly found in schools, gyms, airports, community centers, and many public buildings. Taking a few moments to identify the nearest AED at your child's school, athletic facility, or workplace could one day save a life.

The ["Chain of Survival"](#) for sudden cardiac arrest includes:

1. Recognizing cardiac arrest and calling 911 immediately
2. Starting high-quality CPR
3. Using an AED as soon as possible
4. Receiving advanced emergency medical care
5. Obtaining specialized hospital treatment and recovery support¹

Because sudden cardiac arrest can strike without warning, especially in young people with undiagnosed heart conditions, education, emergency preparedness, and access to AEDs are the most powerful tools to save lives.



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