



# Sudden Cardiac Arrest: Screening and Treatment Protocols



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## **Pediatric Sudden Cardiac Arrest**

Sudden cardiac arrest (SCA) occurs when the heart suddenly or unexpectedly stops beating, preventing blood flow to the brain and other vital organs. Sudden cardiac death is described as a nontraumatic, nonviolent, unexpected event resulting from SCA within 6 hours of previously witnessed state of normal health. SCA also includes those events caused by commotio cordis – the lethal disruption of heart rhythm that occurs as a result of a blow to the chest. In the United States, 2,000 children and adolescents die as a result of SCA each year, representing 3-5 percent of deaths in children ages 5-19.

Many states, including Ohio, have begun passing legislation regarding the education of individuals involved with youth sports and physical activities about the risk factors, signs and symptoms, and treatment of SCA. As a result of these laws, you may see an increase in students and parents asking for screening to prevent SCA in addition to sports physicals.

## **Preventing SCA**

The most effective screening for SCA is an awareness of the risk factors. Many children who have sudden cardiac death have had symptoms or warning signs prior to the time of their SCA. However, these warning signs may not be communicated by a teenager.

Pre-participation personal/family history and physical examination, required by law in Ohio, is the only proven method to find those at risk for SCA. Whereas the use of electrocardiography (ECG) has been discussed, neither the American Heart Association nor the American Academy of Pediatrics recommend an ECG be a required part of the screening process. It is also important to note that sudden cardiac death does not only occur during athletics. Many athletes die when not involved in competitive athletics and the majority of individuals who die of SCA are not athletes. Despite the most aggressive and comprehensive screening, including many diagnostic tests, children at risk for SCA will be missed. Any active child can be at risk. For that reason, education regarding CPR and the use of automatic external defibrillators (AEDs) is so important.

***Even with full cardiac screening, persons at risk for SCA will be missed.***

It is important to realize that some conditions of the heart change or evolve over time, meaning that a once normal heart can develop disease as the child ages. Any child who continues to experience concerning symptoms should have a thorough evaluation by a cardiologist every year.

## **Causes of SCA**

- Electrical heart disease or heart rhythm problems
- Structural heart disease of the heart muscle or of the arteries that supply the heart with blood
- Situational causes including a sudden blow to the chest, infection of the heart muscle, electrocution, recreational drug use

## Minimizing Risk of Sudden Cardiac Death

It is important to remind families, that while it is not possible to prevent every sudden cardiac arrest, we can prevent every sudden cardiac death by developing adequate treatment protocols. SCA is fatal if not treated immediately. The presence of an AED is essential for the survival of someone experiencing SCA. The use of an AED within 5 minutes after an SCA is more effective at saving not only a life, but the quality of life and brain function as well.

Victims of SCA are more likely to survive than victims of traumatic cardiac arrest (for example, in a car accident), but only if they receive prompt support and treatment.

Nationwide Children's Hospital is a proud affiliate of Project Adam, forming Project Adam Ohio, an organization dedicated to making every school a safe place for exercise by educating parents, teachers and administrators about the importance and use of AEDs, including the development of an emergency action plan. As such, Nationwide Children's offers consultations, trainings and educational materials about AEDs. For more information visit: [NationwideChildrens.org/Project-Adam](http://NationwideChildrens.org/Project-Adam).

## When to Refer

Referral to a cardiologist may be indicated if your patient has risk factors, signs or symptoms of SCA. Fainting during physical activity is a warning sign that is often overlooked, but it is a sentinel risk factor for SCA. If your patient faints during or immediately after physical activity, he or she should be removed from physical activity practice and competition until evaluated by a cardiologist.

**Children with a family history of the following should be referred to a pediatric cardiologist:**

- One or more relatives with early or premature death that is sudden and unexplained before age 50 because of heart disease. This may present as sudden death due to a single car accident or drowning, which are suspicious for heart disease.
- Disability from heart disease in a close relative younger than 50
- Specific knowledge of certain heart conditions in family members including hypertrophic or dilated cardiomyopathy, long QT syndrome, Brugada syndrome, Marfan's syndrome or significant rhythm problems.

If your patient experiences chest pain associated with exertion, palpitations or abnormal findings on cardiac examination or on ECG screenings, he or she should be referred to a pediatric cardiologist.

Additionally, cardiologists at Nationwide Children's are available for consultation 24 hours a day, 7 days a week via the Physician Direct Connect Line: (614) 355-0221; (877) 355-0221.

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### \* References:

Maron et al. *American Journal of Cardiology*. 2016;117:1339-1341.

Cecchin F. *Circulation*. 2001;103:2483-2488.

Atkinson E. *Annals of Emergency Medicine*. 2003;42:185-196.

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## Referrals and Consultations

Online: [NationwideChildrens.org/Heart](https://www.NationwideChildrens.org/Heart)

Phone: (614) 722-6200 or (877) 722-6220 | Fax: (614) 722-4000

Physician Direct Connect Line for 24-hour urgent physician consultations:  
(614) 355-0221 or (877) 355-0221.



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