

## 12-step screening may help reduce sudden death in young athletes

A 12-point screening process could help reduce sudden cardiac death in high school and college competitive athletes, according to an updated American Heart Association scientific statement.

The Recommendations for Preparticipation Cardiovascular Screening of Competitive Athletes, published in *Circulation: Journal of the American Heart Association*, revisits the original 1996 statement on this subject and makes no major changes to the mass screening process first recommended at that time. The screening includes 12 questions about personal and family medical history and a physical examination to uncover aspects of a potential athlete's health that could signal a cardiovascular problem:

### Personal history

1. Chest pain/discomfort upon exertion
2. Unexplained fainting or near-fainting
3. Excessive and unexplained fatigue associated with exercise
4. Heart murmur
5. High blood pressure

### Family history

1. One or more relatives who died of heart disease (sudden/unexpected or otherwise) before age 50
2. Close relative under age 50 with disability from heart disease
3. Specific knowledge of certain cardiac conditions in family members: hypertrophic or dilated cardiomyopathy in which the heart cavity or wall becomes enlarged, long QT syndrome which affects the heart's electrical rhythm, Marfan syndrome in which the walls of the heart's major arteries are weakened, or clinically important arrhythmias or heart rhythms.

### Physical examination

1. Heart murmur
2. Femoral pulses to exclude narrowing of the aorta
3. Physical appearance of Marfan syndrome
4. Brachial artery blood pressure (taken in a sitting position)

Parents should verify this information, said members of the expert panel who wrote the statement. If any of the 12 screening elements has a "yes" answer, the participant would be referred for further cardiovascular examination.

The incidence of deaths is in the range of one in 200,000 high school-age athletes per year, based on a 12-year Minnesota study of 1.4 million student-athlete participations in 27 sports.

"Although the frequency of these deaths in young athletes appears to be relatively low, it is more common than previously thought and does represent a substantive public health problem," said Barry J. Maron, M.D., chair of the writing group.

In the United States, these deaths occur most commonly in basketball and football — high intensity sports with high levels of participation. There is some debate whether mass prescreening of competitive athletes should also include an electrocardiogram (ECG) before they are allowed to participate in team sports. An ECG is a special test that reads the heart's electrical activity. Maron says current U.S. recommendations don't include ECGs, most notably due to a lack of policy mandate and infrastructure to support this.

"Recommendations of the European Society of Cardiology and International Olympic Committee include routine ECGs for all potential athletes," said Maron, who is director of the Hypertrophic Cardiomyopathy Center at the Minneapolis Heart Institute Foundation. "However, while advocating this kind of plan in the United States may seem simple, it's a much more complicated matter."

The statement cites several limitations for recommending such widespread, routine ECGs - including the high number of competitive athletes in this country, significantly higher than in other countries, such as Italy, where the tests are routinely conducted.

"Each year, there are probably more than five million competitive athletes at the high school level (grades 9–12), in addition to more than 500,000 collegiate (including NCAA, NAIA, junior colleges) and 5,000 professional athletes," the panel wrote. "This figure does not include youth, middle school, and masters level (age 30 +) competitors for whom reliable numbers are not available. Therefore, the relevant athlete population available for mass screening may be as large as 10 million people per year."

Maron said the total estimated cost of mass screening for that many athletes, along with the follow-up required for abnormal findings, is more than \$2 billion a year. Coupled with other limitations such as a lack of physicians and other medical resources for performing and reading ECGs and no laws to mandate the standards for pre-participation screening, he says the cost effectiveness and feasibility of such a program in the United States cannot justify such a recommendation at this time.

The panel does recommend the development of a national standard for cardiovascular screening of high school and college athletes and notes there has been significant improvement overall in the support and adherence to life-saving screening processes for youth participating in sports. In 1997, a study found 45 percent of states had inadequate screening processes in place, while a 2005 review found 81 percent of states now support adequate screening processes.

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