

Mandatory ECG Screening for Young Athletes

The author argues that such a policy could be cost-effective and save lives.

It was over in a second: my cherished friend and fellow athlete collapsed on the playing field, a victim of sudden cardiac death (SCD). The loss of such a vibrant individual, in the prime of his life, was made even more tragic by the fact that such an event might have been prevented.

For a country that prides itself on preventive care, the United States is behind the curve when it comes to screening its young athletes for cardiac abnormalities. Exact incidence numbers are unknown, but estimates suggest that each year there may be as many as 90 to 100 SCDs among young athletes (about one in every 200,000 athletes) in this country. Undiagnosed heart disease accounts for the majority of these episodes. Adding a 12-lead resting electrocardiogram (ECG) to sports preparticipation physical examination may significantly reduce the number of premature deaths, yet the American Heart Association (AHA) and the American College of Sports Medicine (ACSM) recommend medical history and physical examination as the only tools for cardiac screening of competitive athletes.

The United States should set national standards that include the use of a 12-lead ECG to help prevent SCD in this population. In a 2011 study in *Circulation*, Harmon and colleagues found that among National Collegiate Athletic Association (NCAA) athletes, black males and those on Division I teams who participate in high-intensity sports such as basketball and swimming are at the greatest risk for SCD. Given the variability in incidence estimates resulting from incomplete and sometimes biased reporting, the actual risk may be greater than previously thought. To enable accurate incidence estimates, it should be mandatory that all cases of SCD are reported to a central database.

Since many young athletes with cardiovascular disease are asymptomatic, screening that relies only on personal history and physical examination often fails to detect cardiac conditions that can lead to SCD. For example, a 2011 pilot study by Vetter and colleagues found that just 7% of the youths discovered to have potentially serious cardiac conditions had a positive family history, and none of those with these conditions were identified by physical examination alone.

Several European countries already require ECG screening for young athletes. Over 30 years ago, Italy implemented mandatory screening with ECG for athletes participating in organized sports. Although some commentators have disputed its findings, a 2006 observational study by Corrado and colleagues found that the annual incidence of SCD among young athletes in Italy decreased by 89% after screening implementation.

In spite of such potential benefits, there are many who argue against including an ECG in preparticipation screening. Some cite the high number of false-

positive readings. For example, in individuals with “athlete’s heart,” in which non-life-threatening changes in the heart are due to intense training, ECGs are often read as positive, thus requiring costly follow-up. However, there’s also evidence that many false-positive readings occur because of outdated interpretation guidelines and inexperienced

ECG interpreters. Drezner and colleagues found that false-positive rates are minimized when ECGs are evaluated using standardized criteria.

Undue costs have often been cited as an additional reason for not including ECGs in preparticipation examinations. In general, medical tests are considered cost-effective if the incremental cost-effectiveness ratio is less than \$50,000 per quality-adjusted life-year saved. The estimated ECG screening costs per athlete life-year saved were \$43,000 and \$44,000 in studies by Wheeler and colleagues and Fuller, respectively. Another study by Malhotra and colleagues among Division I NCAA athletes found that the overall cost per diagnosis of adding ECG screening is similar to that of history and physical examination alone.

The demise of a young person is always devastating, and even more so if the cause of death is avoidable. The addition of a 12-lead ECG to preparticipation physical examinations should be endorsed by the AHA and the ACSM before any more athletes die during sports participation. ▼

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Why don’t we care about prevention when it comes to sports?