

## PREVENTION

## Potential benefits of ECG screening in young athletes

Performing 12-lead electrocardiography (ECG) in addition to US standard cardiovascular screening in young athletes improves detection of cardiac abnormalities; furthermore, ECG use may be a cost-effective strategy to prevent sudden cardiac death among this population, according to two studies published in the *Annals of Internal Medicine*.

The risk of sudden cardiac death in young people is 2.5-fold higher in athletes than in nonathletes. Estimates point to 1 in 220,000 young athletes dying suddenly each year owing to unsuspected cardiovascular disease (CVD). Cardiovascular screening before athletic participation has been endorsed by the ACC, the AHA, the ESC, and the International Olympic Committee (IOC). Whereas US guidelines advocate screening by medical history and physical examination only, the ESC and IOC recommend that ECG examinations are also included in the screening.

In a prospective, cross-sectional, double-blind study of 508 young athletes, the investigators compared the outcome of US-standard CVD screening with that of adding ECG to the screening approach. “The inclusion of ECG improves the overall sensitivity of preparticipation screening for the detection of clinically relevant CVD in athletes,” explains study researcher Aaron Baggish. From a total of 11 athletes with cardiac abnormalities relevant to participation in sports (as independently assessed by transthoracic echocardiography), five cases were detected by the standard approach and five additional ones by ECG, thus



increasing screening sensitivity from 45.5% to 90.9%. The false-positive rate of the all-inclusive approach, however, increased from 5.5% to 16.9%, but the current abnormality criteria for ECG “were not derived from the study of athletes [who often have] exercise-induced cardiac remodeling.”

In another study, Matthew Wheeler and colleagues modeled the cost-effectiveness of preparticipation screening of US high-school and college-student athletes with a Markov decision-analysis model. “An argument against use of ECG screening in the US consensus recommendations was based on the perception of poor cost-effectiveness,” explain the investigators. Data were collected from several preparticipation screening studies, and sudden cardiac death rates were obtained from a large Italian study and

modified with US population parameters. According to the model, adding ECG to screening of these athletes could save 2.1 life-years per 1,000 athletes, at a ratio of US\$42,900 per life-year saved. “Our study found that the current method of screening [in the US] is a poor use of resources,” conclude the researchers, although a US-based long-term study is necessary before mandatory ECG-based screening can be recommended.

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**Original articles** Baggish, A. L. *et al.* Cardiovascular screening in college athletes with and without electrocardiography: a cross-sectional study. *Ann. Intern. Med.* **152**, 269–275 (2010) | Wheeler, M. T. *et al.* Cost-effectiveness of preparticipation screening for prevention of sudden death in young athletes. *Ann. Intern. Med.* **152**, 276–286 (2010)