

# Decline of Sudden Cardiac Deaths in Athletes Seen Since Start of Pre-Participation Screening Program

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**Description**

The annual incidence of sudden cardiovascular deaths among young athletes has declined significantly since the start of a pre-participation cardiovascular screening program in northeast Italy, according to a study in the October 4 issue of *JAMA*.

**Newswise** — The annual incidence of sudden cardiovascular deaths among young athletes has declined significantly since the start of a pre-participation cardiovascular screening program in northeast Italy, according to a study in the October 4 issue of *JAMA*.

The majority of young athletes who die suddenly have previously unsuspected structural heart disease. Medical evaluation of athletes before competition offers the potential to identify those without symptoms of potentially deadly cardiovascular abnormalities. Italian law mandates that prior to participating in competitive sports activity, every athlete must undergo a clinical evaluation and obtain eligibility, according to background information in the article. A nationwide systematic screening program was launched in Italy in 1982, which includes a detailed history, physical examination, and an electrocardiogram (ECG); the program has been shown to be effective in identifying athletes with certain heart disorders. However, the long-term impact of such a screening program on prevention of sudden cardiovascular death in athletes has not been known.

Domenico Corrado, M.D., Ph.D., of the University of Padua Medical School, Italy and colleagues analyzed the changes in incidence rates and causes of sudden cardiovascular death in young athletes (age 12 to 35 years) in the Veneto region of Italy between 1979 and 2004, after introduction of systematic pre-participation screening. A parallel study examined trends in cardiovascular causes of disqualification from competitive sports in 42,386 athletes undergoing pre-participation screening at the Center for Sports Medicine in Padua (22,312 in the early screening period [1982-1992] and 20,074 in the late screening period [1993-2004]).

During the study period, 55 sudden cardiovascular deaths occurred in screened athletes (1.9 deaths/100,000 person-years) and 265 sudden deaths in unscreened nonathletes (0.79 deaths/100,000 person-years). Person-years is the number of people in the study times the number of years of follow-up per person. The annual incidence of sudden cardiovascular death in athletes decreased by 89 percent, from 3.6/100,000 person-years in 1979-1980 to 0.4/100,000 person-years in 2003-2004; the incidence of sudden death among the unscreened nonathletic population did not change significantly over that time.

The decline in the death rate started after mandatory screening was started and persisted to the late screening period. Compared with the pre-screening period (1979 – 1981), the relative risk of sudden cardiovascular death was 44 percent lower in the early screening period (1982 – 1992) and 79 percent lower in the late screening period (1993 – 2004). Most of the reduced death rate was due to fewer cases of sudden death from cardiomyopathies (disorder of the heart muscle). During the study period, 2 percent of the athletes were disqualified from competition due to cardiovascular causes.

“All these findings suggest that screening athletes for cardiomyopathies is a life-saving strategy and that 12-lead ECG is a sensitive and powerful tool for identification and risk stratification of athletes with cardiomyopathies,” the authors write. “These data demonstrate the benefit of the current Italian screening program and have important implications for implementing screening strategies for prevention of sudden death in athletes in other countries.” (*JAMA*. 2006;296:1593-1601.)

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Rovigo, Padova, Italy. Please see the article for additional information, including other authors, author contributions and affiliations, financial disclosures, funding and support, etc.

#### Editorial: Protecting Athletes From Sudden Cardiac Death

In an accompanying editorial, Paul D. Thompson, M.D., of Hartford Hospital and the University of Connecticut, Hartford, and Benjamin D. Levine, M.D., of Presbyterian Hospital and the University of Texas Southwestern Medical Center, Dallas, discuss the findings regarding pre-participation screening of young athletes.

“The study by Corrado et al provides the best evidence to date supporting the pre-participation screening of athletes and provocative evidence for including ECGs in this process. However, cardiologists and other physicians involved in the evaluation of athletes can take a valuable lesson from Corrado et al, and collaborate to develop a rigorous, comprehensive regional or national registry to study the pre-participation screening process prospectively and directly, and to determine how to implement such programs most effectively and how to manage asymptomatic athletes with cardiac abnormalities detected by the screening process.”

(*JAMA*. 2006;296:1648-1650. Available pre-embargo to the media at <http://www.jamamedia.org>.)

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