

# Sudden death in young athletes: Important causes not identified by the screening process

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Even though young athletes are required to receive health screens to be cleared to play sports, those tests failed to detect important cardiovascular abnormalities in cleared players, and many were allowed to play despite suspicions of dangerous cardiovascular conditions, according to a large registry study of patients who died from sudden death, being presented March 10 by Kevin Harris, MD, research cardiologist at the Minneapolis Heart Institute Foundation (MHIF). The data is being presented at the annual American College of Cardiology Scientific Sessions in San Francisco.

[Aortic stenosis](#), which occurs when the aortic heart valve does not fully open, is considered a rare, but important, cause of death in young people. Aortic dissection and rupture which occur when the aortic wall tears and ruptures respectively are catastrophic conditions that are not usually associated with the death of younger individuals. However, the role of these very serious conditions is not understood as causes of athletic field deaths and their identification by routine pre-participation screening.

"While the majority of these [young athletes](#) are being screened, there is unfortunately great variability in the screening process, and we have had very sparse data on the effectiveness of these screening efforts," explains Harris, who is also co-director of the [Acute Aortic Dissection](#) Program and director of the echocardiography laboratory at the Minneapolis Heart Institute at Abbott Northwestern Hospital in Minneapolis.

The [American Heart Association](#) has recommended specific historical questions and physical examination components which should comprise pre-participation [cardiac screening](#).

For this study, MHIF researchers analyzed the U.S. National Registry of Sudden Death in Young Athletes for occurrences of sudden death due to aortic disease (including dissection, rupture or [coarctation](#)) and aortic stenosis.

Of the 2,588 deaths in the registry, 44 events were related to aortic stenosis (19) or aortic disease (25). On average, this group of athletes was 17.6 years old, and 40 were males. The most prominent sports represented in this group were football and basketball, followed baseball and softball.

Eighteen of the 19 deaths related to aortic stenosis occurred just after exercise, reported Harris. Also, 16 deaths attributed to aortic disease occurred during exercise, 6 occurred during sedentary activity, and 2 during sleep.

Data on pre-participation screening were available for 34 of the 44 athletes. Of the 34 deaths, 15 young athletes had been assessed specifically by cardiologists, 3 of the athletes had a known aortic abnormality and 8 had previously been diagnosed with aortic stenosis or bicuspid aortic valves—the latter of which occurs when an aortic valve only has two leaflets instead of three.

Based on their findings, the researchers concluded that aortic stenosis and aortic diseases are uncommon, but important, causes of [sudden death](#) among young, competitive athletes, usually while playing basketball or football.

Twenty-five percent of the athletes (11 of 44) complained of symptoms

of chest, back or abdominal pain in days prior to collapse. Three of the 11 had been seen in the emergency room. Two of the 11 had seen a cardiologist the day prior to death.

"We were able to identify the majority of the athletes in this study had been cleared to participate in sports and one-third had been evaluated by a cardiologist," Harris reports. "The widespread screening process failed to detect important [cardiovascular abnormalities](#) in 19 of the deaths. In the remaining 15 cases, suspicion of [cardiovascular conditions](#) was raised, but the athletes were allowed to continue to compete in competitive sports."

Provided by Minneapolis Heart Institute Foundation

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