

Improvement in Preparticipation Cardiovascular Disease Screening in United States High School Student Athletes from 1997 to 2013

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Background: Preparticipation screening of high school student athletes in the United States serves as an important front line for detection of cardiovascular disease. A previous study in 1997 determined that there was suboptimal state mandated screening with respect to the American Heart Association (AHA) recommendations for preparticipation cardiovascular screening of competitive athletes. A follow-up study in 2005, showed that the state sponsored preparticipation physical forms improved with respect to the AHA 12 item guidelines.

Purpose: The purpose of this study was to determine if the current 2013 state preparticipation school physical forms showed continued improvement in cardiovascular disease screening in comparison to 1997 and 2005. Secondary aims of the study were to determine if there were any specific deficiencies with regard to any of the AHA 12 point criteria that could be improved upon; and, to evaluate the type of licensed examiners in each state approved to perform physicals.

Methods: The updated 2013 state preparticipation school physical forms in all fifty states were systematically evaluated to determine the above aims. Data from 1997 and 2005 were extracted from previous published data. Statistical analysis was performed using unpaired t-test, with $p < 0.05$ considered statistically significant.

Results: Between 2005 and 2013, the mean cumulative number of AHA items met on all state physical forms increased from 9.5 ± 2.1 to 11 ± 1.5 ($p < 0.01$). Notably, the percentage of states fulfilling all 12 AHA items was 36% compared to just 6.3% in 2005. From 2005 to 2013, 24 (48%) states had no change in number of AHA items, but, 14 (28%) states showed increases in AHA items (> 2 AHA items). One state, Michigan, had a 9 item increase from 2005 to 2013. On the 2013 school physical forms, the AHA items with lowest overall adherence and the lowest improvement over time (1997, 2005, and 2013) were: physical exam findings of peripheral pulses (including femoral) (31%, 71%, 76%); Marfan stigmata (5%, 8%, 44%); and heart murmur (standing/supine or with Valsalva) (21%, 35%, 50%). From 2005 to 2013, the number of states approving chiropractors, naturopathic, or homeopathic physicians to perform physical exams decreased from 18 to 10.

Conclusion: There has been continued improvement among states in adherence to the AHA 12 point screening guidelines for screening of cardiovascular disease. However, there are still many states not fulfilling all the AHA recommendations for the history and physical exam.