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# Sudden cardiac arrest in school athletes: understanding the role of pre-participation screening.

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# Sudden Cardiac Arrest in School Athletes: Understanding the Role of Pre-participation Screening.

A research report presented to the

Division of Emergency Medicine,

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Master of Science in Medicine (Emergency Medicine)

by

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## ABSTRACT

### Background

Sudden cardiac arrest in young athletes is a tragic event that can potentially be reduced through the implementation of a pre-participation screening program. While the absolute contents of this program are debated, consensus does exist, that should such a program be implemented, a reduction in mortality will be found. The emphasis of any pre-participation screening is found in a history and basic physical examination, with or without routine electrocardiogram testing. This is based on the understanding that 90% of sudden cardiac arrests are attributable to an underlying cardiac pathology with the majority being hypertrophic cardiomyopathy. Debate continues around the cost effectiveness of such a program but there is no doubt that in a society that is promoting an active lifestyle and with the pressure of competitive sport at most schools, there is likely to be zero tolerance for not being able to screen for potentially lethal cardiac pathology.

### Methods

To conduct a pilot pre-participation screening program at one Johannesburg high school, using the American Heart Association (AHA) 12 point questionnaire and the European Society of Cardiology (ESC) resting 12 lead electrocardiogram guidelines. The prevalence of findings has been documented and interpretations made using only the AHA criteria and then the ESC criteria. Further a cost analysis has been done, in order to determine the appropriateness of introducing such a screening program at school level in South Africa and this has been discussed together with the overall feasibility of potentially doing pre-participation screening at high school level.

**Results**

A total of 49 learners out of 164 gave the necessary consent and assent. There was a 53% positive screening when following the AHA protocol and a 24% positive screening when using the ESC criteria for ECG interpretation alone. This data however can be adjusted down if attention is paid to co-morbidities, such as asthma; and to some of the revised ECG criteria. The average cost per learner should screening be done using the AHA 12 element medical history and physical examination together with a resting 12 lead ECG was R244.69

**Conclusion**

Conducting a pre-participation screening program has a number of initial logistical issues, there is also concern that the AHA history taking component needs review and the addition of the ECG, while not fully accepted around the world, does seem to make sense, especially in light of how asymptomatic the patient with undetected hypertrophic cardiomyopathy may be.

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| | |
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| PPSP: | Pre-Participation Screening Program |
| SCA: | Sudden Cardiac Arrest |
| USA: | United States of America |
| ECG: | Electrocardiogram |
| SCD: | Sudden Cardiac Death |
| ESC: | European Society of Cardiology |
| AHA: | American Heart Association |
| HCM: | Hypertrophic Cardiomyopathy |
| CCAA: | Congenital Coronary Artery Anomalies |
| ARVC: | Arrhythmogenic Right Ventricular Cardiomyopathy |
| LQTS: | Long QT Syndrome |
| WHO: | World Health Organisation |
| QALY: | Quality Adjusted Life Years |