

# Screening collegiate athletes: The reliability of the pre-participation survey.

## The Dartmouth College Athlete Screening Registry

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### Introduction

- ❖ The American Heart Association (AHA) recommends a screening history and physical questionnaire to be performed prior to athlete participation to identify athletes at risk for sudden death.
- ❖ The NCAA has adopted the AHA recommendation and requires their athletes to be screened prior to participation.
- ❖ The screening process remains non-standardized with providers of various backgrounds screening the athletes.
- ❖ Other countries and organizations have organized sports medicine screening programs
- ❖ We assessed differences in screening between athletes' primary care provider and a cardiologist-directed sports medicine team.

### Objective

We hypothesized that there would be a discordance in answers to a history and physical examination questionnaire performed by the patient's primary care provider and one performed by a cardiologist directed sports medicine team. (Figure 1)

### Methods

- ❖ Varsity student athletes entering their first year of NCAA sport participation received the AHA endorsed standard 14 item pre-enrollment survey with 10 history questions and 4 physical exam findings to be completed by their home provider
- ❖ The enrollment survey was repeated by members of a cardiologist directed sports medicine team at the college health center with the addition of an ECG.
- ❖ EKGs were interpreted based on the Refined Seattle Criteria.
- ❖ Echocardiography was immediately available if indicated.
- ❖ We report on concordance and discordance between data reported on the 2 surveys.

### Table 1

#### Athlete Baseline Characteristics

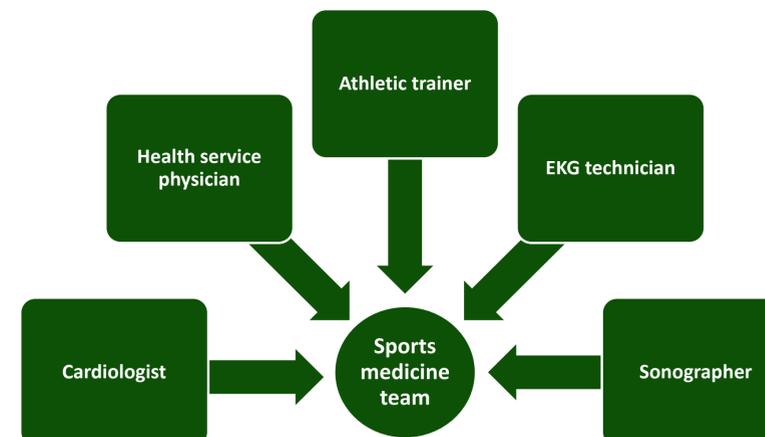
Variable	Measure	
<b>Number of students</b>	N	<b>227</b>
<b>Age, years</b>	mean (SD)	<b>19.2 (.87)</b>
<b>Sex</b>		
<b>Male</b>	N (%)	<b>166 (51.2)</b>
<b>Female</b>	N (%)	<b>158 (48.8)</b>
<b>Height, inches</b>		
<b>Male</b>	mean (SD)	<b>71.9 (4.23)</b>
<b>Female</b>	mean (SD)	<b>66.5 (4.39)</b>
<b>Weight, lbs</b>		
<b>Male</b>	mean (SD)	<b>184.8 (37.27)</b>
<b>Female</b>	mean (SD)	<b>146.6 (28.13)</b>
<b>Body mass index (BMI)</b>		
<b>Male</b>	median (IQR)	<b>24.5 (22.6, 27.1)</b>
<b>Female</b>	median (IQR)	<b>22.7 (21.2, 24.4)</b>
<b>Heart rate, BPM</b>	mean (SD)	<b>66.7 (9.48)</b>
<b>Mean arterial pressure (MAP)</b>	mean (SD)	<b>86.4 (7.48)</b>
<b>Systolic blood pressure (SBP)</b>	mean (SD)	<b>118.6 (10.41)</b>
<b>Diastolic blood pressure (DBP)</b>	mean (SD)	<b>70.2 (8.13)</b>

### Table 2

#### Concordance and Discordance of Survey Results

AHA Questionnaire and Exam	Concordance	Primary provider positive response only	Sports medicine team positive response only
History of chest pain/discomfort	219	3	5
Unexplained syncope/near-syncope	210	0	13
Excessive exertional dyspnea with exercise	213	0	10
History of a heart murmur	217	0	7
Elevated systemic blood pressure	217	0	7
Premature death before age of 50 years	217	0	7
Disability from heart disease in a close relative age <50	219	1	4
Cardiac conditions in family members	210	1	13
Physical Exam	205	2	15

### Figure 1



### Results

- ❖ A total of 227 students were screened prior to the start of the 2015-2016 athletic season with an average age of 18 years. (Table 1)

#### History

- ❖ There were 66 positive answers to history questions obtained by the sports medicine team with negative responses provided by the primary care provider (Table 2).
- ❖ This included 13 positive responses to syncope/presyncope.
- ❖ The reverse was true for only 5 questions.

#### Physical exam findings

- ❖ Fifteen abnormal physical exam findings were found by the sports medicine team. Only 2 were found by the primary care provider.

#### EKG

- ❖ Four abnormal ECGs were found on screening.
- ❖ Of the 4 abnormal ECGs, 3 were associated with a positive response by the sports medicine team and a negative response by the primary care provider.

### Discussion

- ❖ Signs, symptoms and physical exam findings were underreported when AHA 14 point pre-participation survey performed by community primary care was compared to a cardiologist directed sports medicine team.
- ❖ The EKG in this small group provided additive information.

### Conclusions

- ❖ Pre-participation survey results are not highly reproducible.
- ❖ An appointment for a pre-competition history and physical with providers trained and focused on athletic screening provides a very different perspective on the athlete's risk of sudden cardiac death than information obtained from primary care providers and should be considered for the standard of care in the collegiate population.