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Detecting Cardiovascular Disease in the Young Athlete

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Cardiovascular Disease in the Young Athlete



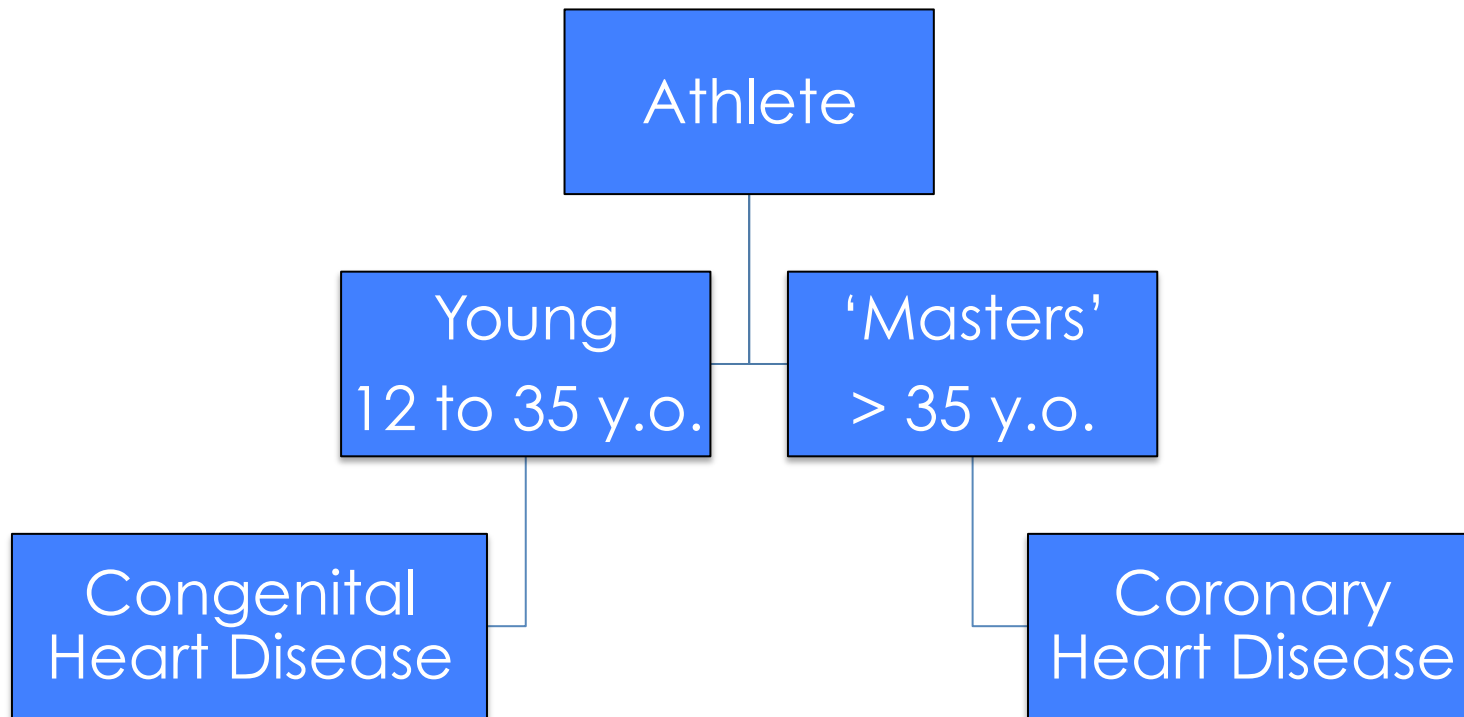
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- Are athletes at increased risk of sudden cardiac death (SCD) compared to non-athletes?
- What is the prevalence of SCD in athletes?
- Is there evidence for screening athletes?
- Preliminary results from the young athlete screening program in British Columbia.

Defining Different Classes of Athletes

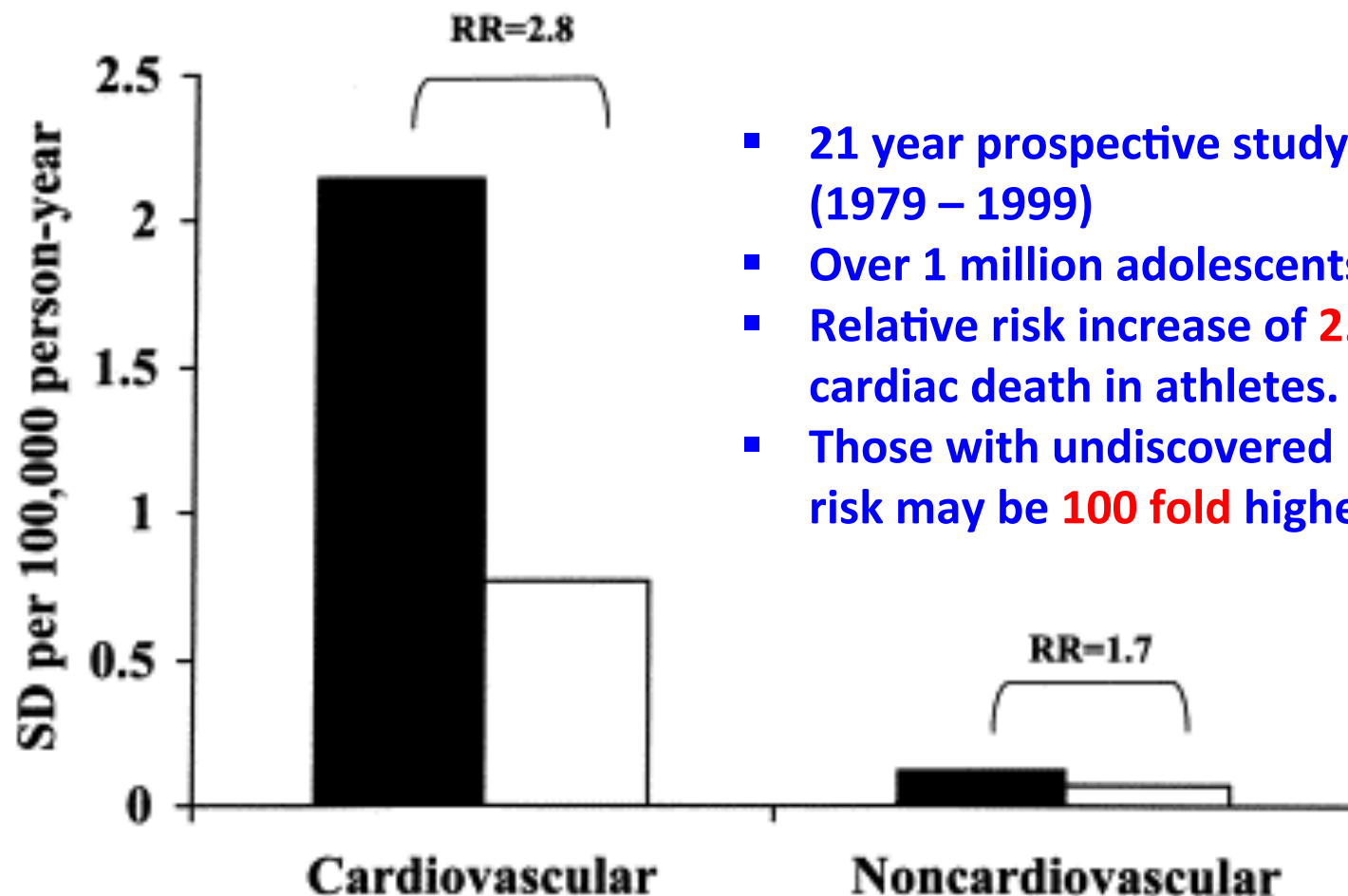


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Are Athletes at Greater Risk?

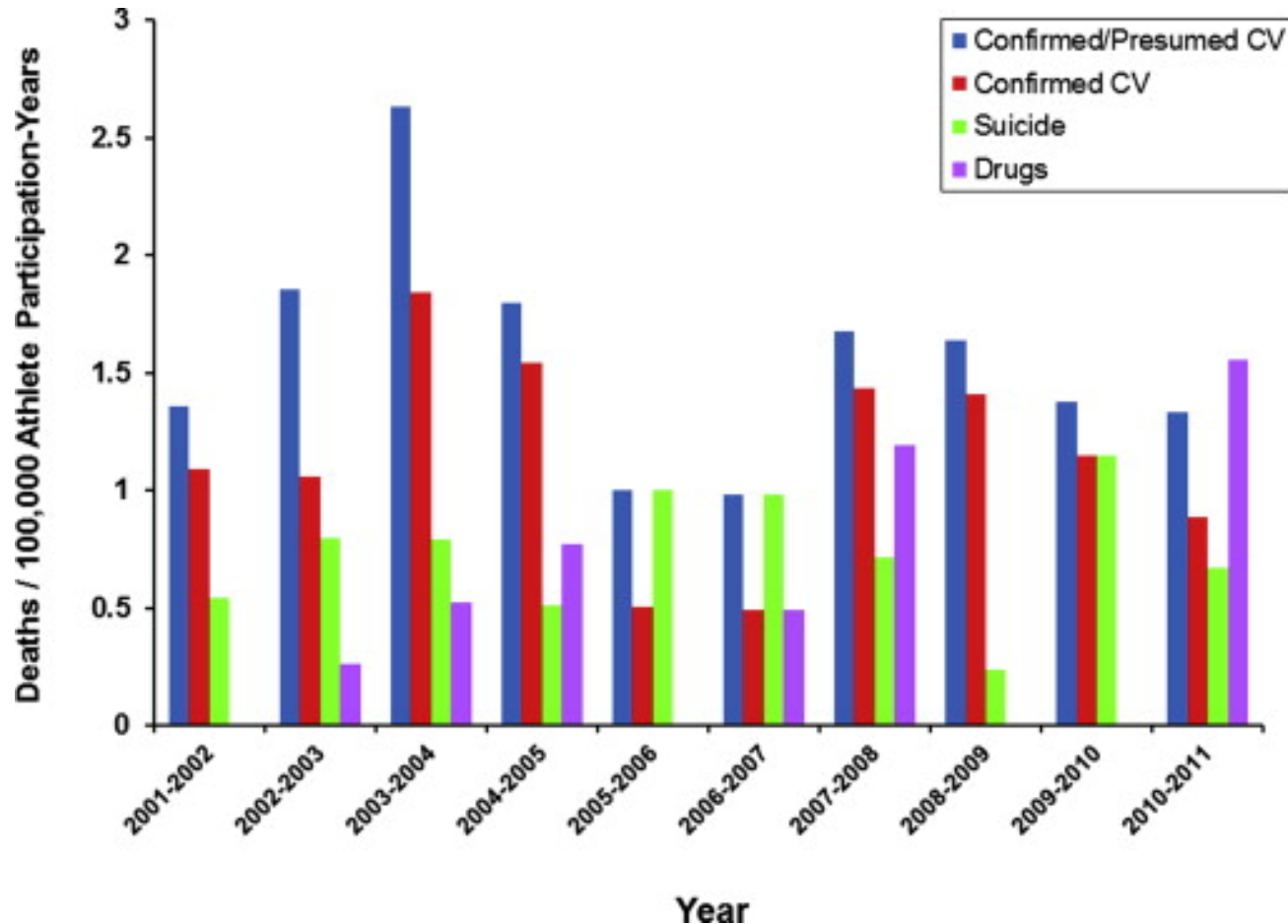


- 21 year prospective study from Italy (1979 – 1999)
- Over 1 million adolescents
- Relative risk increase of **2.5x** for sudden cardiac death in athletes.
- Those with undiscovered heart disease risk may be **100 fold** higher.



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Prevalence of Cardiac Disease in Athletes



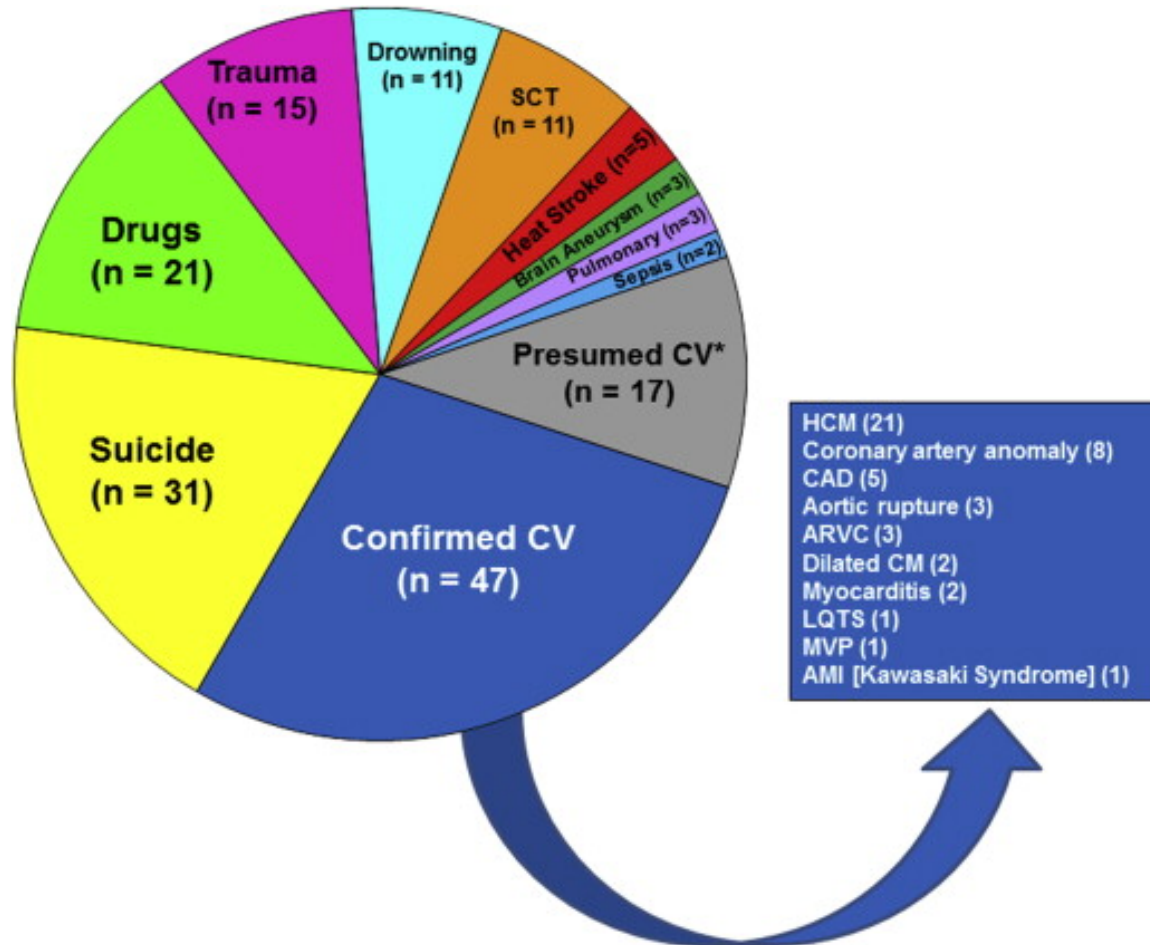
National Collegiate Athletics Association (NCAA). United States Athletes.

- Basketball
- Soccer
- Baseball
- Volleyball
- Baseball
- Rowing
- Karate
- Swimming...

Etiology of Cardiac Disease in Athletes



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47 confirmed cardiovascular deaths

1. Hypertrophic cardiomyopathy
2. Coronary artery anomaly

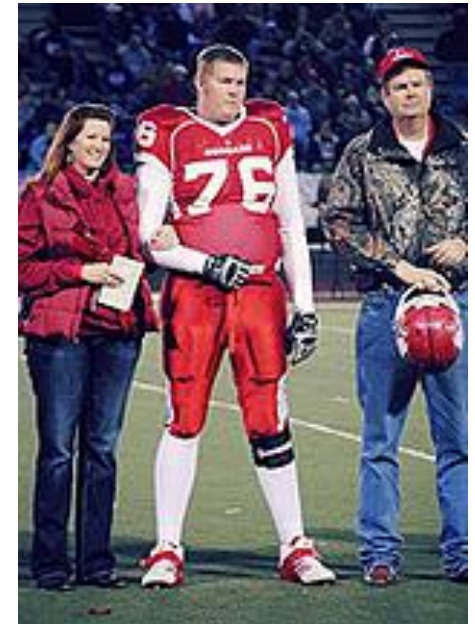
Both pathological states are potentially identifiable through screening



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Impact on the Community

- Devastating impact on athletes, parents and the entire community.
- 2012 Scott Stephen's son, a Texas high school football player died of SCD.
 - Development of Bill H.B. 767
 - Requiring all high school athletes to have mandatory electrocardiograms completed.
 - Texas would be the only state in the country to mandate this type of screening.





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Rationale for Screening

- In 60% of athletes the first presentation of cardiovascular disease can be sudden cardiac arrest.
- Degree and type of screening differs among the major cardiovascular organizations world wide.
- Currently, only Japan, Israel and Italy have implemented national screening programs.



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Evidence for Screening?

- 25 year longitudinal study from Italy between 1979 – 2004.
- Screening using history, physical examination and ECG
- Results of over 33,000 athletes indicated that ECG's had 77% greater power for detecting hypertrophic cardiomyopathy than the United States screening restricted to history and physical.

Current Approaches to Screening Athletes



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EUROPEAN
SOCIETY OF
CARDIOLOGY®



INTERNATIONAL
OLYMPIC
COMMITTEE

- Cardiovascular screening every 2 to 4 years for high school and college athletes.
- History and physical examination.

- Systematic pre-participation screening of young competitive athletes.
- History, physical examination and 12-lead ECG.



Debate Over Inclusion of ECG in Screening Process

- Cost effectiveness of mandating screening.
- Lack of infrastructure
- False positive rates – several studies suggest 8 – 15% of athletes will require secondary testing.
- Expertise in what constitutes normal variants in athletes is necessary.
- Guidelines for ECG interpretation have been established by United States and Europe

Current Screening Recommendations in Canada



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**Canadian Cardiovascular
Society**

Leadership. Knowledge. Community.

- No consensus guidelines currently exist.
- British Columbia has unique and diverse population of young athletes.
- Further data on our athletes are needed to help guide future recommendations.

SportsCardiologyBC – Young Athletes Study



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- *Prevalence of Cardiac Disease in British Columbia for Young Competitive Athletes – Sports Cardiology BC Heart Screening*
- Goals:
 1. To determine prevalence of cardiac disease in a subset of our population.
 2. Utilize AHA and ESC to compare and contrast efficiencies of screening methods.
 3. Provide recommendation for screening strategies.

Preliminary Results – Presented at ACSM



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- >1200 Athletes screened from across B.C.
- Detailed Questionnaire, Physical Exam and ECG



First 697 participants



55 Follow-up cardiovascular evaluations required (7.9%)



26 – Personal histories (palpitations, fainting, fatigue, chest pain)

7 – Family histories

17 – Abnormal ECG

11 – Physical Exam Findings

Young Athlete Study – Protocol Amendments



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- Study has been amended to include questionnaire and ECG and remove physician assessment component.
- Assessing risk without the involvement of a physician.
 - Efficiency
 - Physician fees
- Physical exam can have low utility in detecting abnormalities.

Young Athlete Study – Protocol Amendments



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- AHA and ESC questionnaires sensitivity and specificity can be improved upon.
- Newly developed questionnaire by Sports Cardiology BC researchers.
- Develop a questionnaire and scoring system which can be utilized by physicians, coaches, parents, athletes.
- Score on questionnaire in combination with ECG can guide need for further investigation.



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Summary and Conclusions

- Athletes may be at greater risk of SCD.
- Prevalence rates of SCD are similar to those of suicide and drug deaths in young athletes.
- Screening programs may be effective in the detection of cardiac disease in these athletes.
- Currently there is a lack of consensus on screening protocols.
- More data needs to be collected across B.C. and the country to help guide evidence based screening programs for our athletes.

Acknowledgements and Contact Information –



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Young Athlete Study

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