



ANNUAL GENERAL MEETING

# Cardiac Disease in Young Competitive Athletes



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ORCCA



SPORTSCARDIOLOGYBC



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# Disclosures

- No relevant personal disclosures
- The ORCCA study is supported by the American Medical Society for Sports Medicine (AMSSM) and the American Heart Association (AHA)

# Cardiac Disease in Young Competitive Athletes



0.3% Prevalence of Heart Conditions  
Associated with Sudden Cardiac Arrest



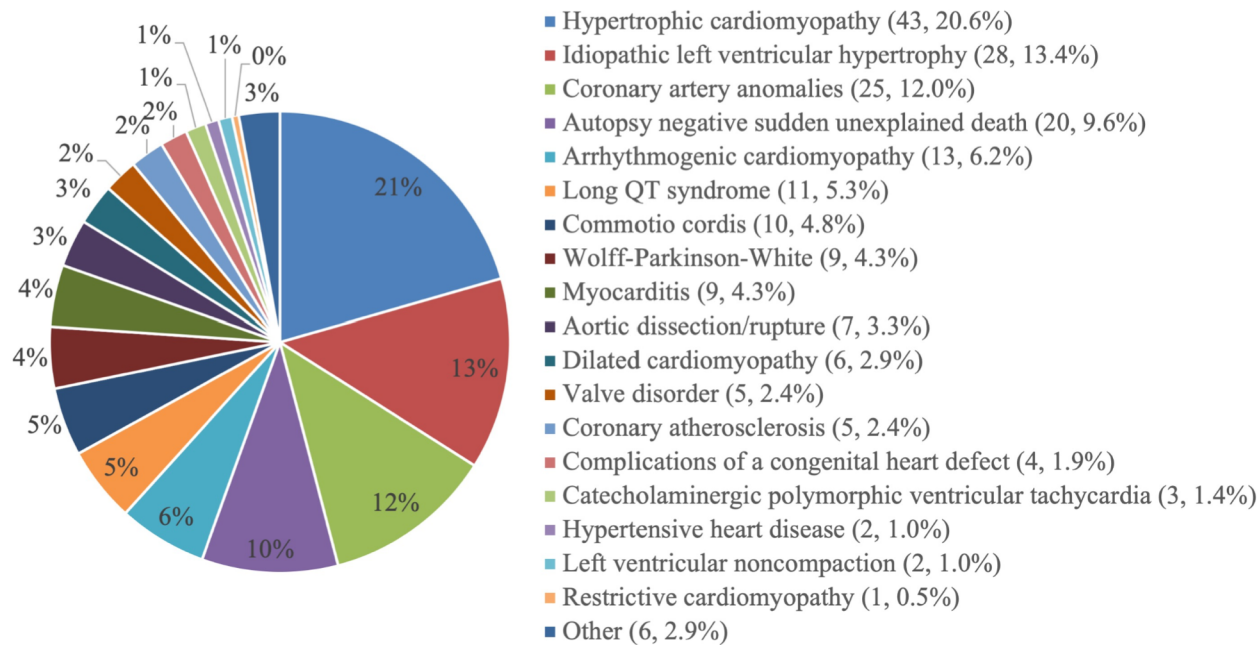
Over 10 University Athletes per year in  
the US suffer Sudden Cardiac Arrest



Many Athletes with Heart Disease May Safely  
Continue Sport, however, little Research Exists to  
Guide these Decisions



# Heart Disease in Young Athletes



Peterson, Br J Sports Med, 2020

**Heart Structure Problem**  
 1) Congenital/Inherited  
 2) Acquired\*

**Primary Heart Electrical  
 System Problem**

\*Acquired Heart Disease such  
 as Coronary Artery Disease rare  
 in those <35

# COVID-19 Cardiac Concerns

**Myocarditis** = Inflammation of the Heart Muscle and can be caused by a Viral Infection (COVID-19)



**Myocarditis** = Cause of SCA in Young Athletes Worsened by Exercise



Canadian Journal of Cardiology 37 (2021) 1165–1174



## Special Article

### **COVID-19—Myocarditis and Return to Play: Reflections and Recommendations From a Canadian Working Group**

James McKinney, MD, MSc,<sup>a</sup> Kim A. Connelly, MBBS PhD,<sup>b</sup> Paul Dorian, MD,<sup>b</sup> Anne Fournier, MD,<sup>c</sup> Jack M. Goodman, PhD,<sup>b</sup> Nicholas Grubic, BScH,<sup>d</sup> Saul Isserow, MBBCh,<sup>a</sup> Nathaniel Moulson, MD,<sup>a</sup> François Philippon, MD,<sup>e</sup> Andrew Pipe, MD,<sup>f</sup> Paul Poirier, MD, PhD,<sup>e</sup> Taryn Taylor, MD,<sup>g</sup> Jane Thornton, MD, PhD,<sup>h</sup> Mike Wilkinson, MBBCh,<sup>j</sup> and Amer M. Johri, MD<sup>i</sup>

**High Rates of COVID-19 Cardiac Involvement seen in non-athlete populations**

# *Outcomes Registry for Cardiac Conditions in Athletes (ORCCA Registry)*

## Cardiac Registry for College Athletes Post-COVID



Aaron  
Baggish, MD

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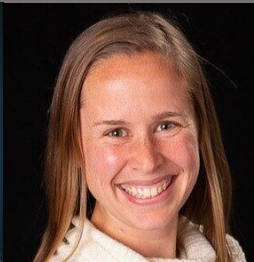
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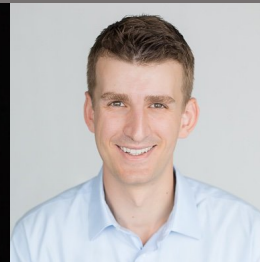
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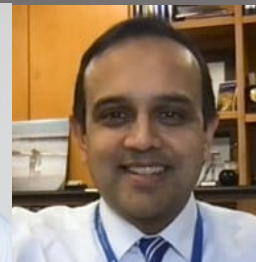
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MASSACHUSETTS  
GENERAL HOSPITAL

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HEART CENTER



ORCCA

# COVID-19 Cardiac Concerns and Athletes

Circulation

## ORIGINAL RESEARCH ARTICLE



### SARS-CoV-2 Cardiac Involvement in Young Competitive Athletes

Nathaniel Moulson, MD\*; Bradley J. Petek<sup>ORCCA</sup>, MD\*; Jonathan A. Drezner, MD; Kimberly G. Harmon, MD; Stephanie A. Kliethermes<sup>ORCCA</sup>, PhD; Manesh R. Patel, MD; Aaron L. Baggish<sup>ORCCA</sup>, MD; for the Outcomes Registry for Cardiac Conditions in Athletes Investigators†

Circulation

## RESEARCH LETTER

### Cardiovascular Outcomes in Collegiate Athletes After SARS-CoV-2 Infection: 1-Year Follow-Up From the Outcomes Registry for Cardiac Conditions in Athletes


Bradley J. Petek<sup>ORCCA</sup>, MD\*; Nathaniel Moulson, MD\*; Jonathan A. Drezner<sup>ORCCA</sup>, MD; Kimberly G. Harmon<sup>ORCCA</sup>, MD; Stephanie A. Kliethermes<sup>ORCCA</sup>, PhD; Timothy W. Churchill<sup>ORCCA</sup>, MD; Manesh R. Patel<sup>ORCCA</sup>, MD; Aaron L. Baggish<sup>ORCCA</sup>, MD; for the ORCCA Investigators†

- Multicenter study at 45 US Colleges/Universities
- Low prevalence of SARS-CoV-2 Cardiac Involvement (0.5-3.0%)
- Low prevalence of persistent post-COVID symptoms (0.06%)
- Low prevalence of adverse CV events in >1 year of follow-up (0.03%)
- No SARS-CoV-2 related Sudden Cardiac Arrest

# RTP Guidance

TRAINING/PRACTICE: CONTEMPORARY ISSUES IN CARDIOLOGY PRACTICE | ARTICLES  
IN PRESS

## COVID-19, Inflammatory Heart Disease, and Vaccination in the Athlete and Highly Active Person: An Update and Further Considerations

Nathaniel Moulson, MD • Kim A. Connelly, MBBS PhD • Paul Dorian, MD • ... Jane Thornton, MD, PhD •  
Mike Wilkinson, MBBCh • James McKinney, MD, MSc   • [Show all authors](#)

Published: May 26, 2022 • DOI: <https://doi.org/10.1016/j.cjca.2022.05.019>



### Box 1: Cardiopulmonary Symptoms of Concern

#### Cardiopulmonary Symptoms of Concern

- Presyncope or syncope
- Chest pain or pressure, particularly with exertion
- Excessive shortness of breath at rest or with exertion
- Palpitations
- Reduction in fitness out of proportion to the severity of illness or duration away from training

#### Practical Guidance

- The development of any cardiopulmonary symptom should prompt at minimum a medical evaluation to characterize the symptom in question
- Symptoms of deconditioning are common following COVID-19 and may be more pronounced compared to other viral illnesses<sup>2</sup>
- A high index of clinical suspicion should be applied to athletes presenting with new cardiopulmonary symptoms after COVID-19



# RTP Guidance

## Clinical Presentation

Prior Asymptomatic or Resolved  
Remote Infection†

Acute Asymptomatic Infection:  
PCR or Rapid Antigen

Mild Symptoms with Initial Infection

Cardiopulmonary Symptoms with  
Initial Infection

Cardiopulmonary Symptoms with RTP

Cardiopulmonary Symptoms post-  
Vaccine

## Recommendation

- No restriction or testing required

- RTP after recommended quarantine completed^
- No cardiac testing required

- RTP once recommended quarantine completed and symptoms resolved\*
- No cardiac testing required

- Clinically indicated Cardiac Evaluation†
- Hold RTP until evaluation complete

- Clinically indicated Cardiac Evaluation
- Stop RTP until evaluation complete

- Clinically indicated Cardiac Evaluation
- Hold RTP until evaluation complete



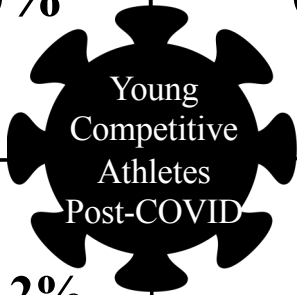
# ORCCA Phase II

**Objective:** Investigate the Areas of Clinical Uncertainty Pertaining to Management and Outcomes Among Young Competitive Athletes with a Suspected or Confirmed “High-Risk” Cardiac Diagnosis




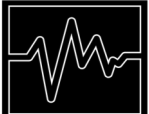
**Methods:** Leverage and Expand Upon the Established Infrastructure of ORCCA Phase I to Create the First Large-Scale Cardiovascular Registry Focused on this Population

# ORCCA Study Outcomes

## Phase I

SARS-CoV-2 Cardiac Involvement	Adverse CV Outcomes
0.5-3.0%	0.03%
 <p>Young Competitive Athletes Post-COVID</p>	
<p>&gt;3 wk: 1.2%</p> <p>&gt;12 wk: 0.06%</p>	OR = 3.1
Persistent Symptoms	Cardiopulmonary Symptoms

## Phase II

Adverse CV Outcomes	Psychosocial Health
	
	
Shared Decision Making	Disease Progression

Young Competitive Athletes with Cardiac Condition

# Cardiac Conditions

**Table 1.** Inclusion Criteria for ORCCA

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**1. Competitive athletes ages 18-30 years old\* diagnosed within the past 2 years with 1 of the following:**

- *Pathologic Cardiac Condition*
    - Cardiomyopathy
    - Primary Electrical Disease
    - Myocarditis
    - Coronary Artery Disease/Anomaly
    - Congenital Heart Disease
    - Valvular Heart Disease\*\*
    - Aortopathy
  - *Cardiac Finding of Unknown Significance*
    - Markedly Abnormal ECG per the International Criteria (13) with Normal Cardiac Imaging<sup>^</sup>
    - Marked Left Ventricular Hypertrophy ( $\geq 14\text{mm}$  M,  $\geq 13\text{mm}$  F)
    - Aortic Dilatation ( $\geq 40\text{mm}$  M,  $\geq 34\text{mm}$  F)
    - Subclinical ventricular scar or late-gadolinium enhancement on CMR<sup>^^</sup>
    - Non-compacted LV myocardium with concerns for underlying cardiomyopathy
-

# Canadian Enrolment



- Anticipated Enrolment of Canadian Athletes Starting Fall 2022
- Direct Enrolment of Athletes through Central Study Website



<https://orccastudy.org>





# Thank you!



## Questions, Comments, Collaboration

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