Return to Sports post COVID: Associated Cardiac Risks

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Disclosure:
I do not have a relevant financial relationship

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Objectives

- Recognize common cardiac injury from COVID
- Identify best tests and imaging modalities to identify various forms of cardiac injury
- Understand current cardiac testing algorithm for competitive athletes returning from COVID
- Review return to play guidelines post COVID

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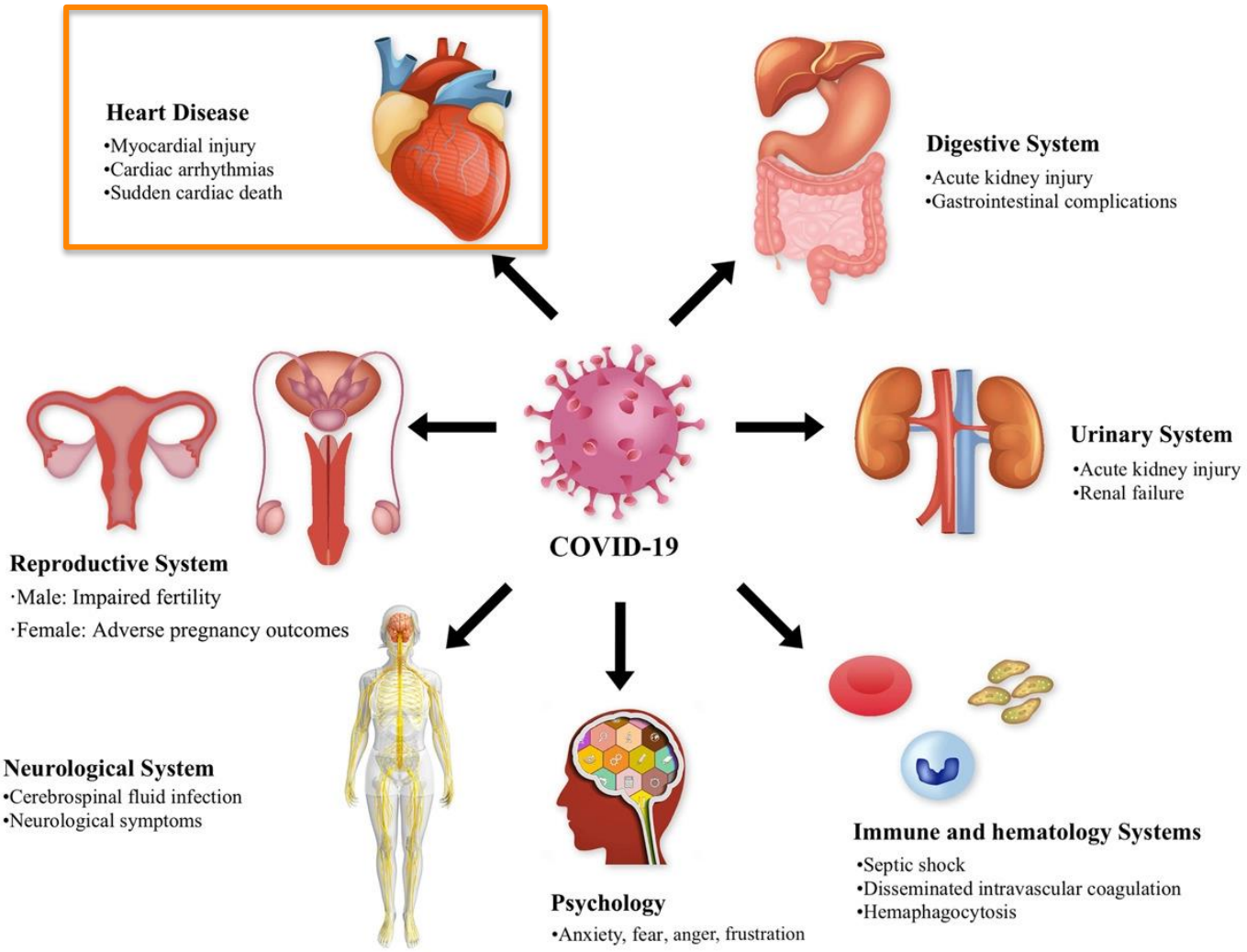
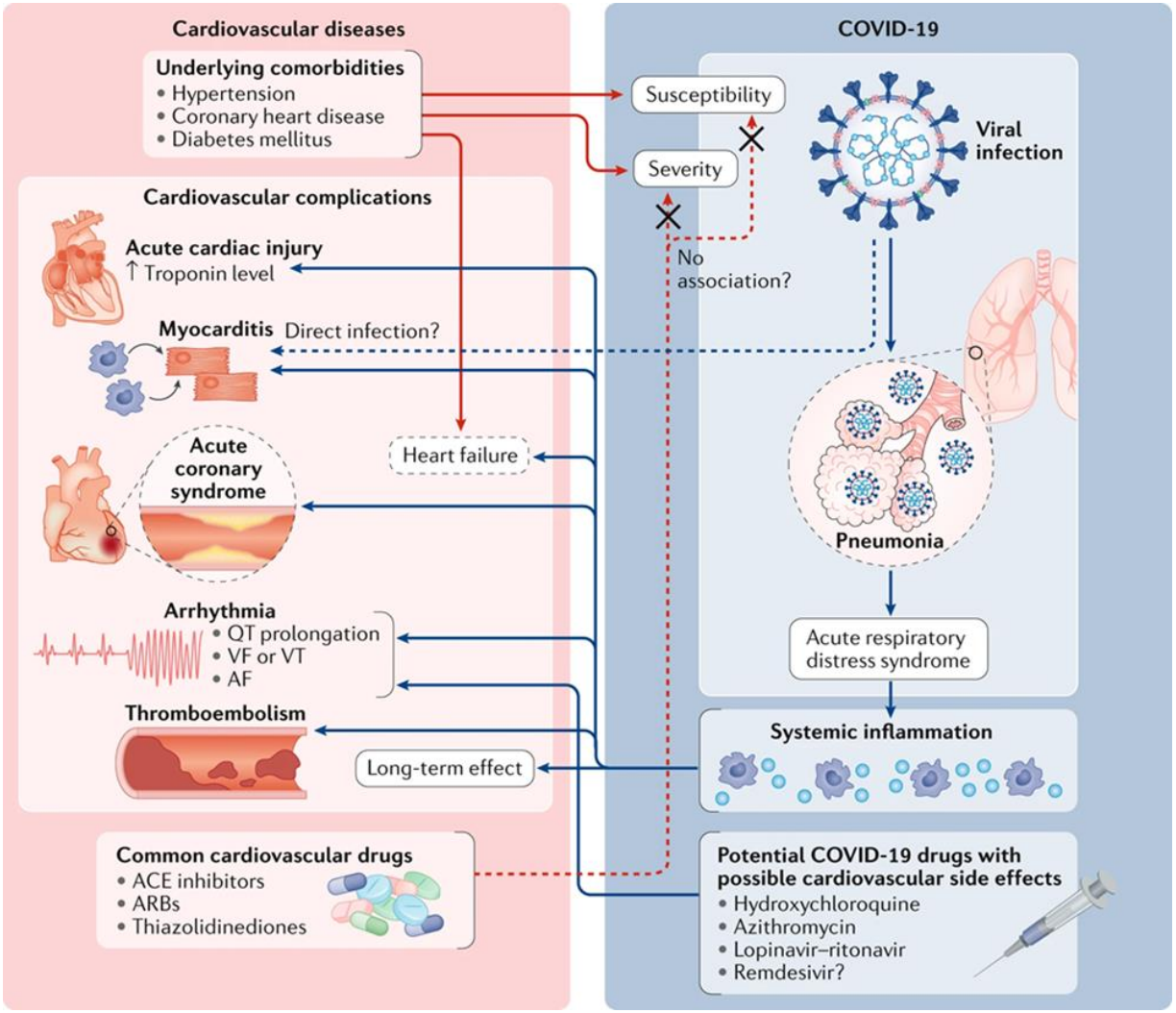
COVID-19 affects multiple organ systems



Journal of Medical Virology. **10 July 2020 https://doi.org/10.1002/jmv.26294**

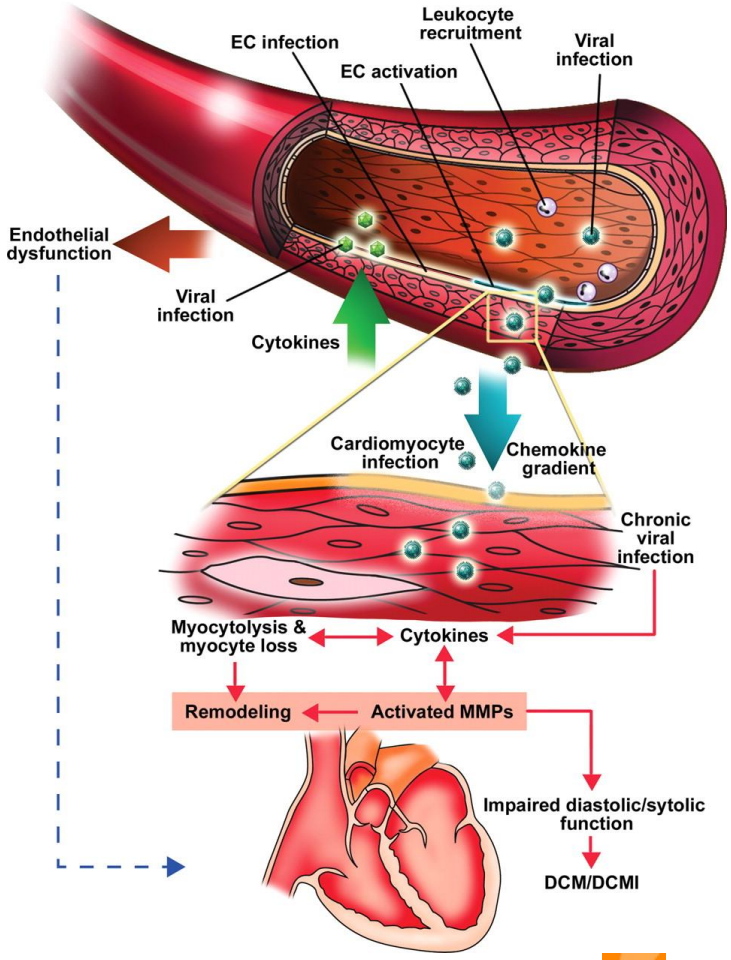
COVID-19 causes cardiovascular complication



Nature Reviews Cardiology **volume 17**, pages543–558(2020)

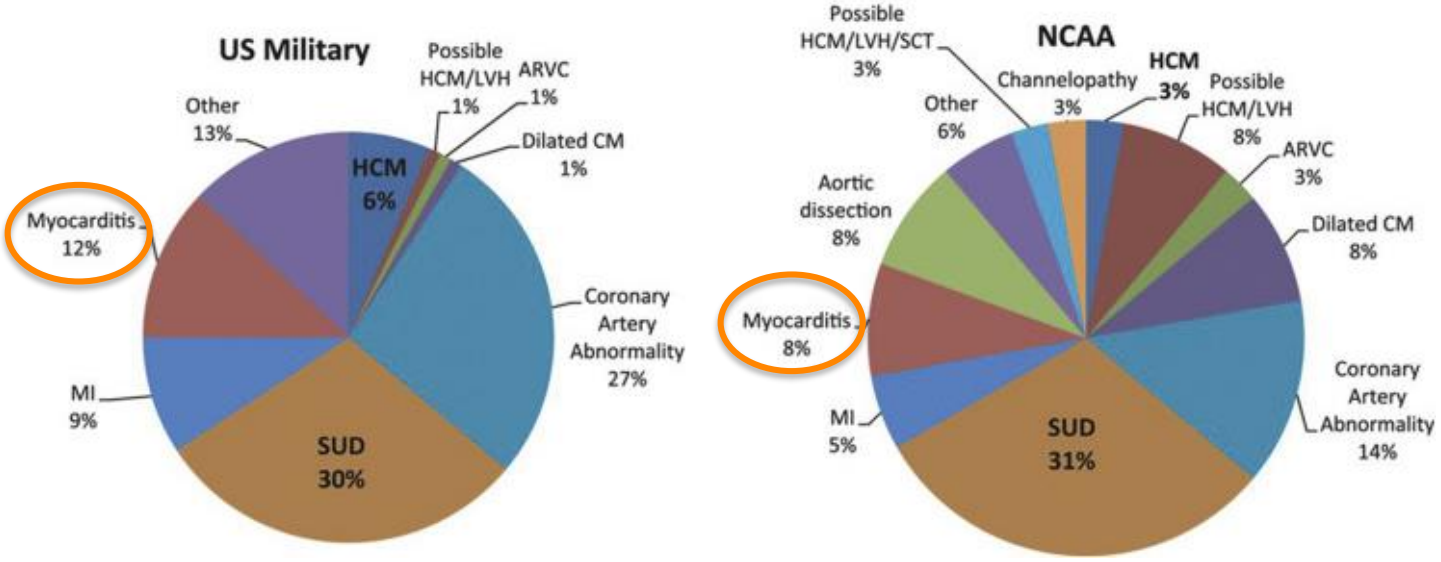
Etiology of Myocardial injury ?

- 20% (increased N-terminal pro-B-type natriuretic peptide (NT-proBNP) and cardiac troponin I (cTnI) levels (7-36%)
- ACE-2 dependent infection within the myocardium versus cytokine storm mediated by T-helper cell ?



Myocarditis

- Common viruses are more likely to cause myocarditis (heart muscle inflammation): Influenza, Mono, Coxsaxie & Parvo
- Estimated that 1-5% of ALL acute viral infections affect the myocardium



JACC: Sudden Cardiac Death in Athletes. Jan 2018. https://doi.org/10.1016/j.jchf.2017.07.014

Circulation

RESEARCH LETTER

COVID-19 Myocardial Pathology Evaluation in Athletes With Cardiac Magnetic Resonance (COMPETE CMR)

Myocarditis is a leading cause of sudden cardiac death among athletes and may occur without antecedent symptoms. Coronavirus disease 2019 (COVID-19)–related cardiac magnetic resonance (CMR) abnormalities have been described in 78% of mostly ambulatory adults,[1] creating concerns over COVID-19–related myocarditis in athletes. A report of 26 COVID-19–positive collegiate athletes revealed late gadolinium enhancement (LGE) in 46%, with 4 (15%) meeting modified Lake Louise criteria for myocarditis.[2,3] However, without an athletic comparator group it is difficult to discern whether LGE represents healing myocarditis or athletic remodeling, because inferoseptal right ventricular insertion LGE is common among athletes.[4] We report the findings of a larger CMR study to evaluate the prevalence and extent of cardiovascular pathology among COVID-19–positive collegiate athletes, with comparison with athletic and healthy control groups.

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- Prevelance of myocarditis in collegiate athletes after COVID-19 is modest (3%)
- Focal LGE isolated to the inferoseptal RV insertion present in 22% of COVID-19+ athletes, compared to an identical LGE pattern in 24% of athletic controls.
- Focal inferoseptal RV insertion LGE is common in athletes, may represent remodeling from athletic training, and should not be conflated with myocarditis.

Brief Report

ONLINE FIRST FREE

January 14, 2021

Evaluation for Myocarditis in Competitive Student Athletes Recovering From Coronavirus Disease 2019 With Cardiac Magnetic Resonance Imaging

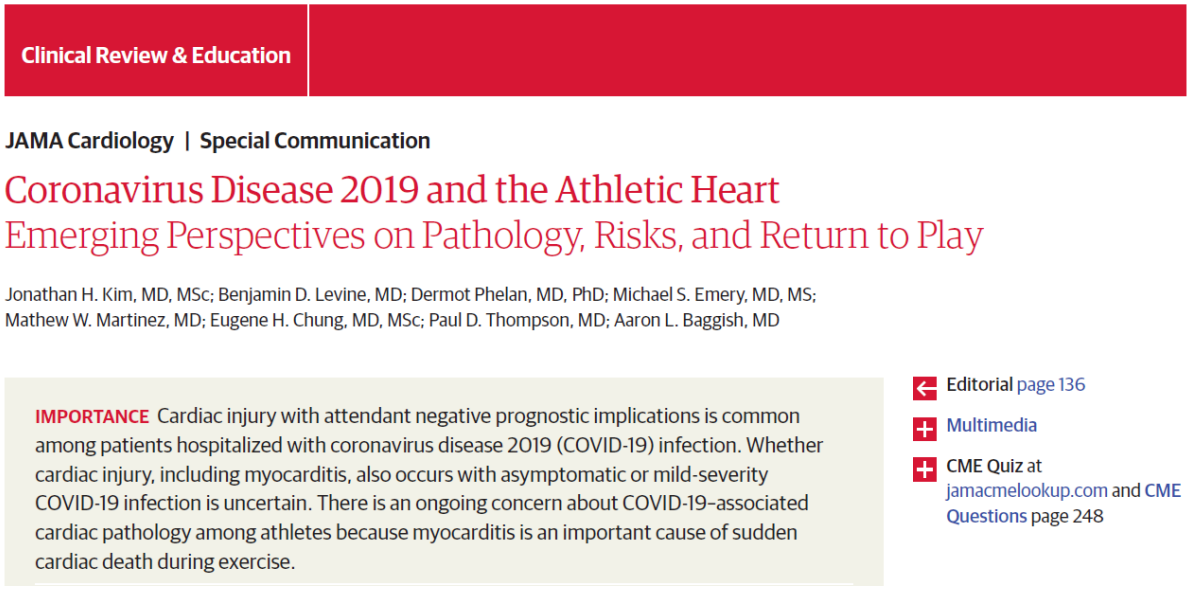
Jitka Starekova, MD[1]; David A. Bluemke, MD, PhD[1,2]; William S. Bradham, MD, PhD[1,3]; et al

» Author Affiliations | Article Information

JAMA Cardiol. Published online January 14, 2021. doi:10.1001/jamacardio.2020.7444

COVID-19 Resource Center

- Most of the athletes had mild (49%) or moderate (28%) symptoms during the acute COVID infection or were asymptomatic (17%).
- None had severe symptoms or required chest radiography or hospital admission.
- Cardiac MRI performed at a median of 15 days after a positive COVID test was consistent with myocarditis in only two athletes (1.4%) based on updated Lake Louise criteria.



Clinical Review & Education

JAMA Cardiology | Special Communication

Coronavirus Disease 2019 and the Athletic Heart
Emerging Perspectives on Pathology, Risks, and Return to Play

Jonathan H. Kim, MD, MSc; Benjamin D. Levine, MD; Dermot Phelan, MD, PhD; Michael S. Emery, MD, MS; Mathew W. Martinez, MD; Eugene H. Chung, MD, MSc; Paul D. Thompson, MD; Aaron L. Baggish, MD

IMPORTANCE Cardiac injury with attendant negative prognostic implications is common among patients hospitalized with coronavirus disease 2019 (COVID-19) infection. Whether cardiac injury, including myocarditis, also occurs with asymptomatic or mild-severity COVID-19 infection is uncertain. There is an ongoing concern about COVID-19–associated cardiac pathology among athletes because myocarditis is an important cause of sudden cardiac death during exercise.

Editorial page 136
Multimedia
CME Quiz at jamacmelookup.com and CME Questions page 248

- Abnormal screening results were identified in 30 athletes (3.8%)
  - troponin, 6 athletes [0.8%]
  - ECG, 10 athletes [1.3%]
  - echocardiography, 20 athletes [2.5%]
  - Necessitating additional testing; 5 athletes (0.6%) ultimately had cardiac magnetic resonance imaging findings suggesting inflammatory heart disease (myocarditis, 3; pericarditis, 2).

Current Guidelines

Screening for Cardiac Involvement in Athletes Recovering From COVID-19 - American College of Cardiology (acc.org)

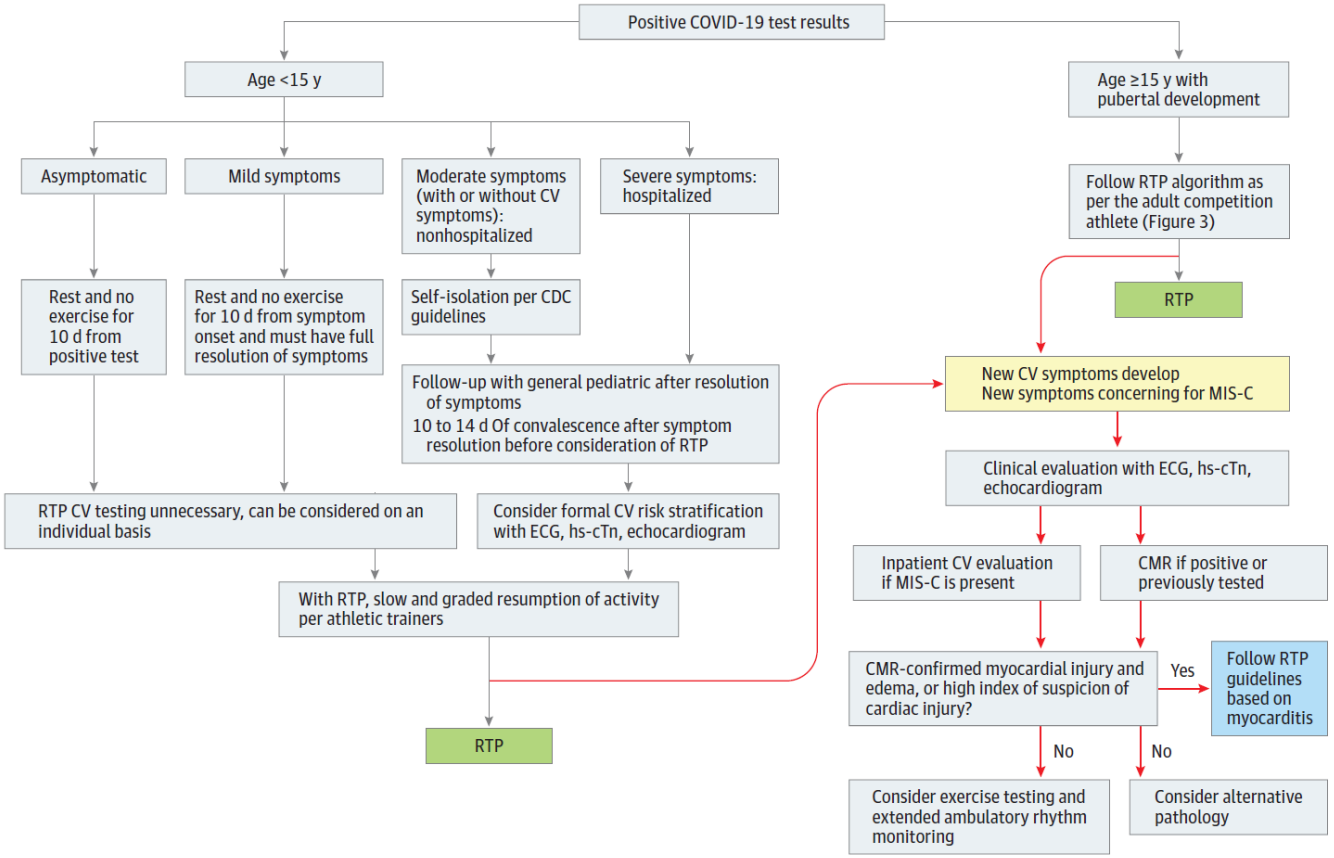
Coronavirus Disease 2019 and the Athletic Heart: Emerging Perspectives on Pathology, Risks, and Return to Play - PubMed (nih.gov)

- History and physical remains central to any evaluation of the athlete; symptoms should guide appropriate workup
- Asymptomatic and mildly symptomatic athletes probably do not need as much testing as first thought; longitudinal data will guide further recommendations.
- Those with moderate or worse symptomatology, cardiac testing (electrocardiogram [ECG], high-sensitivity troponin, echocardiogram) is still recommended at this time prior to RTP

Current Guidelines- RTP High School Sports

[Coronavirus Disease 2019 and the Athletic Heart: Emerging Perspectives on Pathology, Risks, and Return to Play | Infectious Diseases | JAMA Cardiology | JAMA Network]

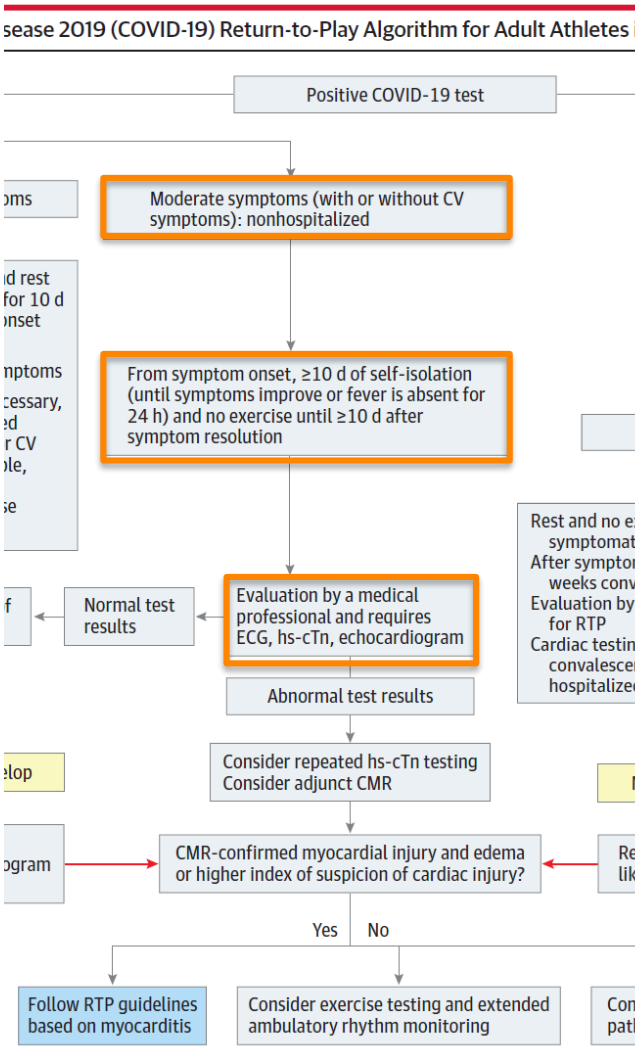
Figure 1. Proposed Coronavirus Disease 2019 (COVID-19) Return-to-Play Algorithm for Athletes in Competitive High School Sports



JAMA Cardiol. 2021;6(2):219-227. doi:10.1001/jamacardio.2020.5890

Current Guidelines- RTP Adult

[Coronavirus Disease 2019 and the Athletic Heart: Emerging Perspectives on Pathology, Risks, and Return to Play | Infectious Diseases | JAMA Cardiology | JAMA Network]



Take Home Lesson

- ***Moderate symptoms*** *(systemic symptoms with fever or cardiorespiratory symptoms) should be medically evaluated with an ECG, cTn, and echocardiogram after completing the rest period before returning full activity.*

- *Athletes with **no or mild symptoms** do not need extensive testing and can gradually proceed to full activity after an appropriate length of quarantine.*