**Return To Play After COVID-19**

Paul D. Thompson, MD  
Chief of Cardiology - Emeritus, Hartford Hospital  
Professor of Medicine, UCONN  
Staff Cardiologist, Massachusetts General Hospital  
Paul.thompson@hhchealth.org  
Blog - https://medium.com/@pauldthompsonmd  
Twitter - @pauldthompsonMD

**Financial Disclosures**

- **Research Support**: Sanofi, Novartis, Esperion, Amgen.  
- **Consultant**: Amgen, Esperion  
- **Speaker Honoraria**: none  
- **Stock Shareholder**: Abbvie, Abbott Labs, J&J; General Electric, Medtronic, Moderna, Shock-Wave Medical, Serapta, J&J, CVS, Nike
A 19 Year Old, Junior Hockey Goalie

9/27/20 - Cough & Fatigue
9/27/20 - PCR + COVID-19
10/2/20 - Symptoms Resolved
10/3/20 - RLQt Pain → Appendicitis → Antibiotics
10/15/20 - SOB
10/25/20 - Chest Pain → CHX & ECG → Nl
11/2/20 - Pulmonary Evaluation → Nl
10/9/20 - Echocardiogram → BiCusp AoV → ↑ AoRoot → 4.5
11/24/20 - Chest CT Angiogram → Enlarged Aorta → 4.3
   Multiple Troponins → Negative

I Reread His Studies and His Aortic Root Was Normal

This Is An Example of What I Call Diagnostic Creep

An ? Unnecessary ? Test
Leads to an Unrelated Diagnosis
That Complexifies Decision Making
So, What’s The Issue With Exercise / Sport & COVID-19

- The Unknown
- High Rates of Elevated Tn in Sick Patients
- Suggesting Myocardial Injury +/- Myocarditis
- Myocarditis Is A Cause of Exercise – Related SCD
- Possibility That Exercise Increases Viral Replication or Disease Severity

416 Hospitalized Patients
- 82 (19.7%) Had “Cardiac Injury”
- Defined as cTnI > 99th %ile
- With A Worse Prognosis
**But There Are Issues With hsTn**

- It is extremely sensitive so many even "healthy" people have some elevation
- It is both a marker of injury & a prognostic indicator
- People with elevations do worse but is the Tn the cause or an effect?
- Exercise can increase it

---

9 trained men
- Ran a treadmill marathon
- TnT measured before & q 30 minutes
- All increased TnT between 1-2 hours
- All normal within 1 hour of finish
- All but 1 had a second late peak

Middleton et al. JACC 2008

---

- cTnT elevated in all runners
- "Physiologic" not "pathologic"
- Bi-phasic release

Middleton et al. JACC 2008
Exercise-Induced Cardiac Troponin I Increase and Incident Mortality and Cardiovascular Events

Vincent L. Aengevaeren, MD
Maria T.E. Hopman, MD, PhD
Paul D. Thompson, MD
Esmeé A. Bakker, MSc
Keith P. George, PhD
Dick H.J. Thijssen, PhD
Thijs M.H. Eijsvogels, PhD


• cTnI in 725 Walkers, Age 61 (54-69 yrs)
• Before / After 30-55 km
• cTnI >99th Percentile
• All Cause Mortality & CV Events
• Average - 43 Months Follow-Up
Late Gadolinium Enhancement

• Gadolinium Enters Myocardial Areas of Fibrosis
• Because Filament Structure Allows Its Retention
• So, It’s a Marker of Myocardial Scarring & Fibrosis

Lots of Concerns About Athletes

RESEARCH LETTER

Cardiovascular Magnetic Resonance Findings in Competitive Athletes Recovering From COVID-19 Infection

Myocarditis is a significant cause of sudden cardiac death in competitive athletes and can occur with normal ventricular function. Recent studies have raised concerns of myocardial inflammation after recovery from coronavirus disease 2019 (COVID-19), even in asymptomatic or mildly symptomatic patients. Our objective was to investigate the use of cardiac...
**RESERCH LETTER**

**Cardiovascular Magnetic Resonance Findings in Competitive Athletes Recovering From COVID-19 Infection**

- cMRI – All (n=26) Ohio State Athletes + COVID-19, June – August 2020
- 57.7% Male, None Hospitalized
- 12 (46%) - Mild Sx; 14 (54%) - No Sx
- All Had Nl: ECG, Echo, cTnI
- 4 (15%) - 2 Criteria for Myocarditis (2 effusion)
- 12 (30.8%) Had LGE

JAMA Cardiology Published online September 11, 2020

---

**Problems ?**

- No Control of Non-Covid Athletes...Because
- Some Athletes Have LGE
- And What Do Non-COVID Infections Do To cMRI ?
• 59 Vanderbilt Athletes - 10-162 days Post
• 60 Uninfected “Athletes
• 29 Uninfected Non-Athletes
• 22% No & 75% Mild Symptoms
• 3% Had cMRI Evidence of Myocarditis
• 39% of Athletes, 13% Controls, 8% Nl Had Myocardial Involvement

• 145 Athletes at Vanderbilt 11-1k94 days Post
• No (16%), Mild (49%), Moderate (28%), ? (7%) Symptoms
• Only 1.4% Had “Myocarditis”
So Do 15, 3 or 1.4% of Previously Healthy, College Athletes Develop “Myocarditis” After COVID-19 Infection?

And Does Finding A Test Abnormality Matter

• Sure....It Gets You a Publication
• But Where Are The Bodies ?

Myocarditis in Athletes Is a Challenge
Diagnosis, Risk Stratification, and Uncertainties

We need better data on how to manage myocarditis in athletes

Paul D Thompson and G William Dec
Take Home Messages - Get a Medical Evaluation

- If They Were Very Sick / Hospitalized
- If They Remain Unwell, Decreased Performance
- If They Have New Symptoms
- If YOU Are Worried

If They Were Not / Are Not Sick

- Quarantine
- Return To Full Training Gradually
- Look For Symptoms
- Know CPR, Have a Defibrillator, & Plan
Otherwise

Teacher, Leave Those Kids Alone

Return To Play After COVID-19

Paul D. Thompson, MD
Chief of Cardiology - Emeritus, Hartford Hospital
Professor of Medicine, UCONN
Staff Cardiologist, Massachusetts General Hospital
Paul.thompson@hhchealth.org
Blog - https://medium.com/@pauldthompsonmd
Twitter - @pauldthompsonMD