# COVID 19 and Return to Play Clinical Pathway

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*This pathway is intended as a guide for physicians, physician assistants, nurse practitioners and other healthcare providers. It should be adapted to the care of specific patient based on the patient’s individualized circumstances and the practitioner's professional judgment.*

*Updated: December 2021*

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Rationale:

This clinical pathway was developed by a consensus group of JHACH physicians, advanced practice providers and nurses and to standardize the management of children who had COVID-19 and how to safely allow them to return to play competitive sports. It addresses the following clinical questions or problems:

1. When is it safe for adolescents to return to playing competitive sports after being infected with COVID-19
2. When to consult Pediatric Cardiology for further evaluation after recovering from COVID-19 infection
3. What are the definitions of mild, moderate and severe COVID-19 infections.

Background
COVID-19 has varying degrees of impact on the heart. In the early portion of the pandemic, there was concern that this impact was almost always severe and would have lingering effects on the heart. Overtime, we have learned that not everyone has a significant illness with COVID 19 and the effects on the myocardium are variable. More importantly, many young athletes can safely return to play after having COVID 19.

To help answer the question about who can safely return to play and how to make that decision, this pathway was developed. This document is based on currently published literature as of 1/16/2021 and is a summary of recommendations agreed upon by the Pediatric Cardiologists of the Johns Hopkins All Children’s Heart Institute and Dr. Patrick Mularoni, Director of Sports Medicine for Johns Hopkins All Children’s Hospital.
Definitions of COVID-19 Illness Severity

**Asymptomatic COVID-19 Patient:**
This is a patient who tested positive for COVID-19 but did not display any symptoms consistent with COVID-19.

**Mildly Symptomatic COVID-19 Patient:**
This is a patient who tested positive for COVID-19 and also had one or more of the following for < 4 days:
- Fever (> 100.4F)
- Fatigue
- Anosmia or Ageusia (aka loss of sense of smell/taste)
- Nausea / Vomiting / Diarrhea
- Headache
- Cough
- Sore Throat
- Nasopharyngeal Congestion
- Chills
- Myalgias
- Severe lethargy
- Hypoxia / Pneumonia

**Moderately Symptomatic COVID-19 Patient:**
This is a patient who tested positive for COVID-19 and had any of the above symptoms for ≥ 4 days OR:
- Cardiac symptoms (any one or more of the following):
  - Chest pain/tightness/pressure at rest/exercise
  - Palpitations
  - Syncope
- May have been hospitalized in a non-ICU setting.

**Severely Symptomatic COVID-19 Patient:**
This is a patient who had severe symptoms and hospitalized in an ICU for any duration.

Clinical Management
The following algorithm ([Figure 1](#)) is recommended in determining the timing of when adolescents can return to play sports after having COVID-19. The following algorithm stratifies adolescents based on age.
Fig. 1: Cardiovascular (CV) Return to Play (RTP) after COVID-19 – Adolescent Athlete
As noted in the diagram, children > 15 yrs of age with pubertal development follow the adult competitive athlete decision making algorithm (Fig. 2). This is provided below.
Fig. 2 Return to Play after COVID-19 – Competitive Athlete
Return to Play after MIS-C and/or Myocarditis
The authors of the JAMA Cardiology article have indicated that if the athlete has MIS-C and/or Myocarditis, then follow the 2015 AHA/ACC Recommendations on Myocarditis\textsuperscript{3,4} and Return to Play. Those recommendations are as follows:

- **Restriction from sports for 3-6 months from diagnosis**
- **3-6 months from diagnosis, undergo the following tests:** (Class I; Level of evidence C)
  - Echo
  - 24 hr Holter
  - Exercise Stress Test
- **Resume training and/or competition if ALL of the following criteria are met:** (Class IIa; Level of Evidence C)
  - Normal ventricular systolic function
  - Serum markers of myocardial injury, heart failure & inflammation have returned to normal levels
  - No evidence of clinically relevant arrhythmias by Holter & ECG
Johns Hopkins All Children’s Hospital

**Sports Medicine Recommended Graduated Return-to-Play Protocol**

**Zone Return to Play Protocol after COVID-19 Infection**

All children > 12 yrs of age must complete the progression below without the development of chest pain, chest tightness, palpitations, exaggerated shortness of breath for level of activity, lightheadedness or syncope. If these symptoms develop, the child should be referred to the evaluating physician. The following progression should take at least 7 days to complete with minimum of 24 hours between each training exercise. Stage 1 and Stage 4 are completed twice.

<table>
<thead>
<tr>
<th>RTP Zone</th>
<th>Functional exercise</th>
<th>Target Heart Rate*</th>
<th>Duration</th>
<th>Date completed/ Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage 1: Day 1</strong> (must be done twice before going to Stage 2)</td>
<td>Light Activity- light jogging, stationary cycling, no resistance training</td>
<td>&lt;70% Heart Rate Max</td>
<td>15 minutes</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 1: Day 2</strong></td>
<td>Light Activity- light jogging, stationary cycling, no resistance training</td>
<td>&lt;70% Heart Rate Max</td>
<td>15 minutes</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 2: Day 3</strong></td>
<td>Simple Movement Activity, ladder drills</td>
<td>&lt;80% Heart Rate Max</td>
<td>30 minutes</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 3: Day 4</strong></td>
<td>More complex agility/sport drills, exercise coordination, resistance training</td>
<td>&lt;80% Heart Rate Max</td>
<td>45 minutes</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 4: Day 5</strong> (must be done twice before going to Zone 5)</td>
<td>Normal training activities, functional skills/drills</td>
<td>&lt;80% Heart Rate Max</td>
<td>60 minutes</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 4: Day 6</strong></td>
<td>Normal training activities, functional skills/drills</td>
<td>&lt;80% Heart Rate Max</td>
<td>60 minutes</td>
<td></td>
</tr>
<tr>
<td><strong>Stage 5: Day 7</strong></td>
<td>Resume Normal Training</td>
<td>Resume Normal Training Intensity</td>
<td>Resume Normal Training Times</td>
<td></td>
</tr>
</tbody>
</table>

*Although heart rate monitoring is suggested, the functional exercise activity will achieve the target heart rate.
References


2) Kim, J MD, MSc et al Coronavirus Disease 2019 and the Athletic Heart: Emerging Perspectives on Pathology, Risks, and Return to Play JAMA Cardiol. Published online October 26, 2020. doi:10.1001/jamacardio.2020.5890


Outcome Measures:

List any outcome measures your team will be following and plan to report to clinical pathways program coordinator.

- Patients with moderate/severe disease who are appropriately restricted from sports
- Patients with asymptomatic/mild disease who are allowed to return to play
- Sudden cardiac arrest events in patients who were evaluated by our cardiology team and returned to play

Clinical Pathway Team
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Date Approved by JHACH Clinical Practice Council: 5/3/2021
Date Available on Webpage: 12/9/2021
Last Revised: 12/9/2021

Disclaimer

Clinical Pathways are intended to assist physicians, physician assistants, nurse practitioners and other health care providers in clinical decision-making by describing a range of generally acceptable approaches for the diagnosis, management, or prevention of specific diseases or conditions. The ultimate judgment regarding care of a particular patient must be made by the physician in light of the individual circumstances presented by the patient.

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