Return to Exercise Guidance After COVID-19 Infection – March 17, 2021

This document provides guidance for return to exercise in pediatric patients 6-20 years without significant cardiac disease who contract SARS-CoV-2 infection (COVID-19 disease). For the purpose of this document, “exercise” is considered to be physical education, organized sports, or moderate to vigorous play. It is important to note these guidelines are based on expert opinion and should not supersede best individual clinical judgement.

Background:

COVID-19 disease causes significant morbidity and mortality, particularly in older adults. While children are typically less severely affected than adults, COVID-19 is not always benign in this population. Cardiovascular complications may rarely include myocarditis and Multisystem Inflammatory Syndrome in Children (MIS-C). The risks and benefits of athletic participation in pediatric patients with a history of SARS-CoV-2 infection are continuously being evaluated, but limited data on which to base recommendations for return to exercise are available.

Several guidelines to help patients return to exercise after SARS-CoV-2/COVID-19 infection have been published. More information can be found in the references, below, and/or at the CHaD continuing education webinar at this link:


It is generally agreed that all patients who test positive for COVID-19 should be restricted from exercise for at least a 10-day period that begins at the time of symptom resolution or date of positive result if asymptomatic. It is also agreed that all patients who test positive for COVID-19 should be stratified for their risk of cardiovascular involvement post-infection, particularly for risk of myocarditis. The attached algorithm guides licensed clinicians on the risk stratification process.

The focus of the return to exercise risk stratification should be to identify cardiac symptoms consistent with myocarditis, which can include new or unexplained chest pain, palpitations, dizziness, syncope, or shortness of breath (out of proportion for upper respiratory tract infection).
Guidelines for return to exercise are based on the severity of COVID-19 infection. The American Academy of Pediatrics prioritizes fever (T > 100.4°F) and systemic symptoms such as chills, GI symptoms, headache, lethargy, or myalgia. Loss of taste and/or smell, congestion, cough, and rhinorrhea are not considered systemic symptoms in this guideline and should not be included for the purpose of risk stratification. Categories therefore include:

1. **Asymptomatic:** Children without symptoms should not exercise for a 10-day period following a positive test. They should be cleared for gradual return to exercise by their primary care provider and referred to Pediatric Cardiology if necessary, based upon that evaluation.

2. **Mild:** Children with mild symptoms (fever for < 4 days or systemic symptoms lasting < 1 week) should not exercise for a 10-day period following the resolution of symptoms. They should be cleared for gradual return to exercise by their primary care provider and referred to Pediatric Cardiology if necessary, based upon that evaluation.

3. **Moderate:** Those with moderate symptoms (fever for 4 or more days or systemic symptoms lasting 1 week or more) should not exercise for a 10-day period following the resolution of symptoms. They should be cleared for gradual return to exercise by their primary care provider including an in-person evaluation with electrocardiogram (ECG) and referred to Pediatric Cardiology if necessary, based upon that evaluation.

4. **Severe:** Children with severe presentations (hospitalization or MIS-C) should be evaluated and cleared for gradual return to exercise by Pediatric Cardiology based on their clinical course. Those with MIS-C will likely be treated as though they have myocarditis and restricted from participation for 3-6 months.

All patients with a history of COVID-19 infection should gradually return to exercise as per the progression below, stopping participation if any symptoms develop. Concerning symptoms such as new or unexplained chest pain, palpitations, dizziness, syncope, or unexpected shortness of breath should prompt a referral to Pediatric Cardiology. In caring for these patients, it is helpful to keep in mind that each week off from exercise results in loss of several weeks of conditioning; it should be anticipated that patients will experience symptoms of deconditioning when exercise is resumed.

**References:**

2. Peter N Dean, MD, FACC; Lanier Burns Jackson, MD; Stephen M. Paridon, MD, American College of Cardiology (acc.org, **July 14, 2020**)
COVID19: GRADED RETURN-TO-EXERCISE AFTER MEDICAL CLEARANCE (MINIMUM 7 DAYS)*

Once cleared to begin return to exercise, children and adolescents must complete the below progression without the development of chest pain/tightness, palpitations, lightheadedness, significant exertional dyspnea, pre-syncope, or syncope. If any of these symptoms develop, the patient should be referred to Pediatric Cardiology.

*Calculating Max Heart Rate: 220 – Your Age = Predicted Max Heart Rate (beats/min)

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
<th>Stage 5</th>
<th>Stage 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity Description</td>
<td>Days 1-2</td>
<td>Light</td>
<td>Increased duration and intensity</td>
<td>Increased duration and intensity</td>
<td>Increased duration and intensity</td>
<td>Fully return to competition</td>
</tr>
<tr>
<td>Examples of exercise allowed</td>
<td>Walking, elliptical, low intensity stationary bike</td>
<td>Jogging, running drills, increased intensity stationary bike</td>
<td>Sport-specific Drills</td>
<td>Normal practice activities</td>
<td>Complete practice</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>15 min</th>
<th>30 min</th>
<th>45 min</th>
<th>60 min</th>
<th>Entire practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>% max heart rate</td>
<td>&lt;70% ~ 140 bpm</td>
<td>&lt;80% ~ 160 bpm</td>
<td>&lt;80% ~ 160 bpm</td>
<td>&lt;80% ~ 160 bpm</td>
<td>No limit</td>
</tr>
</tbody>
</table>

Adapted from Elliott N, et al., infographic, British Journal of Sports Medicine, 2020

Reference:
Screening History for Return to Exercise Clearance in Patients age 6-20 years with COVID-19 Infection

Name: ______________________________________________ DOB: _______________________

Date of COVID-19 positive test: __________________________________________________________

Symptoms with duration, including temperature reading: ______________________________________

Date of COVID-19 symptom resolution: _____________________________________________________

Severity:

<table>
<thead>
<tr>
<th>Asymptomatic</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ test only</td>
<td>Fever &lt; 4 days or systemic symptoms* &lt; 1 week</td>
<td>Fever ≥ 4 days or systemic symptoms* ≥ 1 week</td>
<td>Hospitalized (including MIS-C)</td>
</tr>
</tbody>
</table>

* Fever is T > 100.4 F. Systemic symptoms include chills, GI symptoms, headache, lethargy, myalgia.

Known significant heart disease

(If Yes, contact office of primary cardiologist for clearance)

Following resolution of acute COVID-19 infection, has the patient had:

- Chest pain/discomfort/tightness/pressure
- Unexplained syncope or near syncope
- Unexplained shortness of breath or fatigue
- Palpitations

If Yes to any of the above → refer to Pediatric Cardiology for clearance

- History of elevated systemic blood pressure
- Prior restriction from participation in sports
- Prior cardiac testing ordered by a physician
- Family history of premature death <50yrs due to heart disease
- Disability due to heart disease in a close relative <50yo
- Family history of HCM/Dilated cardiomyopathy, long QT/ion channelopathies, Marfan syndrome, significant arrhythmias, or genetic cardiac conditions
- History of heart murmur (excluding innocent/resolved murmurs)

If moderate illness OR Yes to any of the above → schedule for in clinic examination by PCP

If the severity is asymptomatic or mild and all of the above are No, → instruct the patient on the graded return to exercise.
CHaD Return to Exercise Guidance After COVID-19 Infection

This algorithm is based on expert opinion and should not supersede best individual clinical judgement.
COVID-19 positive test in 6 - 20 year old with no known significant cardiac disease

1. Asymptomatic or Mild Illness
   (Fever ≤ 4 days or systemic symptoms ≤ 1 week)

2. Moderate Illness
   (Fever ≥ 4 days or systemic symptoms ≥ 1 week)

3. Severe Illness
   (Hospitalization, including MIS-C)

4. Screening history by PCP* office no sooner than 10 days after symptom resolution or positive test if no symptoms
   • New or unexplained chest pain, palpitations, dizziness, syncope, or shortness of breath (out of proportion for upper respiratory tract infection)?

5. Any other positive AAP PPE cardiac screening questions\(^5\) (not addressed at prior PPEs)?

6. PCP in person evaluation:
   • AAP PPE Cardiac Screening\(^5\)
   • ECG
   • Any cardiac abnormalities?

7. Pediatric Cardiology evaluation no sooner than 14 days after symptom resolution and/or positive COVID test:
   • ECG
   • Consider echocardiogram, troponin (hs-Tn)
   • In severe illness consider Holter, exercise stress test
   • Additional testing as appropriate
   Return to exercise as prescribed by cardiologist

Graded Return to Exercise\(^6*\)

STAGE 1: Day 1 and Day 2 - 15min/day or less
   Light activity (walking, jogging, stationary bike); intensity no greater than 70% maximum heart rate (~ 140 bpm).
   NO resistance training.

STAGE 2: Day 3 – 30min/day or less
   Add simple movements activities (running drills) at intensity no greater than 80% maximum heart rate (~ 160 bpm).

STAGE 3: Day 4 – 45min/day or less
   More complex training at intensity no greater than 80% maximum heart rate (~ 160 bpm). May add light resistance training.

STAGE 4: Days 5 and Day 6 – 60min/day or less
   Normal training activity at intensity no greater than 80% maximum heart rate (~ 160 bpm).

STAGE 5: Return to full activity.

Calculating Max Heart Rate: 220 – Your Age = Predicted Max Heart Rate (beats/min)

* See suggested tools on the webpage

1. Patients known to have significant cardiac disease should be cleared by their cardiologists with appropriate testing determined based on the specific situation.
2. Fever is considered to be a temperature > 100.4 F.
3. Systemic symptoms include chills, GI symptoms, headache, lethargy, myalgia.
4. Consider Pediatric Pulmonary consultation
5. As per 5th Edition AAP PPE Monograph
6. Symptoms at any Stage require Cardiology consult

Symptoms at any stage require Cardiology consult