

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:

<https://ce.dartmouth-hitchcock.org/Activity/7318440/Detail.aspx>.

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 ($T > 100.4^{\circ}\text{F}$) 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:

1. Phelan D, Kim JH, Chung EH. A Game Plan for the Resumption of Sport and Exercise After Coronavirus Disease 2019 (COVID-19) Infection. *JAMA Cardiol*. Published online **May 13, 2020**. doi:10.1001/jamacardio.2020.2136.
2. Peter N Dean, MD, FACC; Lanier Burns Jackson, MD; Stephen M. Paridon, MD, American College of Cardiology (acc.org, **July 14, 2020**)
3. Kim JH, Levine BD, Phelan D, 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.
4. "COVID-19 Interim Guidance: Return to Sports." American Academy of Pediatrics, **March 1, 2021**. <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-interim-guidance-return-to-sports/>

**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)

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Timeframe	Days 1-2	Day 3	Day 4	Days 5-6	Day 7	Fully return to competition
Activity Description	Light	Light but increased duration	Increased duration and intensity	Increased duration and intensity	Increased duration and intensity	
Examples of exercise allowed	Walking, elliptical, low intensity stationary bike No weightlifting	Jogging, running drills, increased intensity stationary bike No weightlifting	Sport-specific Drills Light weightlifting	Normal practice activities	Complete practice	
Time	15 min	30 min	45 min	60 min	Entire practice	
% max heart rate	<70% ~ 140 bpm	<80% ~ 160 bpm	<80% ~ 160 bpm	<80% ~ 160 bpm	No limit	

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

Reference:

1. Elliott N, Martin R, Heron N, Elliott J, Grimstead D, Biswas A (June 2020). Infographic. Graduated return to play guidance following COVID-19 infection. *British Journal of Sports Medicine*. <https://doi.org/10.1136/bisports-2020-102637>.

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:

Asymptomatic	Mild	Moderate	Severe
+ test only	Fever < 4 days or systemic symptoms* < 1 week	Fever ≥ 4 days or systemic symptoms* ≥ 1 week	Hospitalized (including MIS-C)
ANSWER QUESTIONS BELOW	ANSWER QUESTIONS BELOW	ANSWER QUESTIONS BELOW	REFER TO PEDIATRIC CARDIOLOGY

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

Known significant heart disease Y N

(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 Y N
 Unexplained syncope or near syncope Y N
 Unexplained shortness of breath or fatigue Y N
 Palpitations Y N

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

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

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

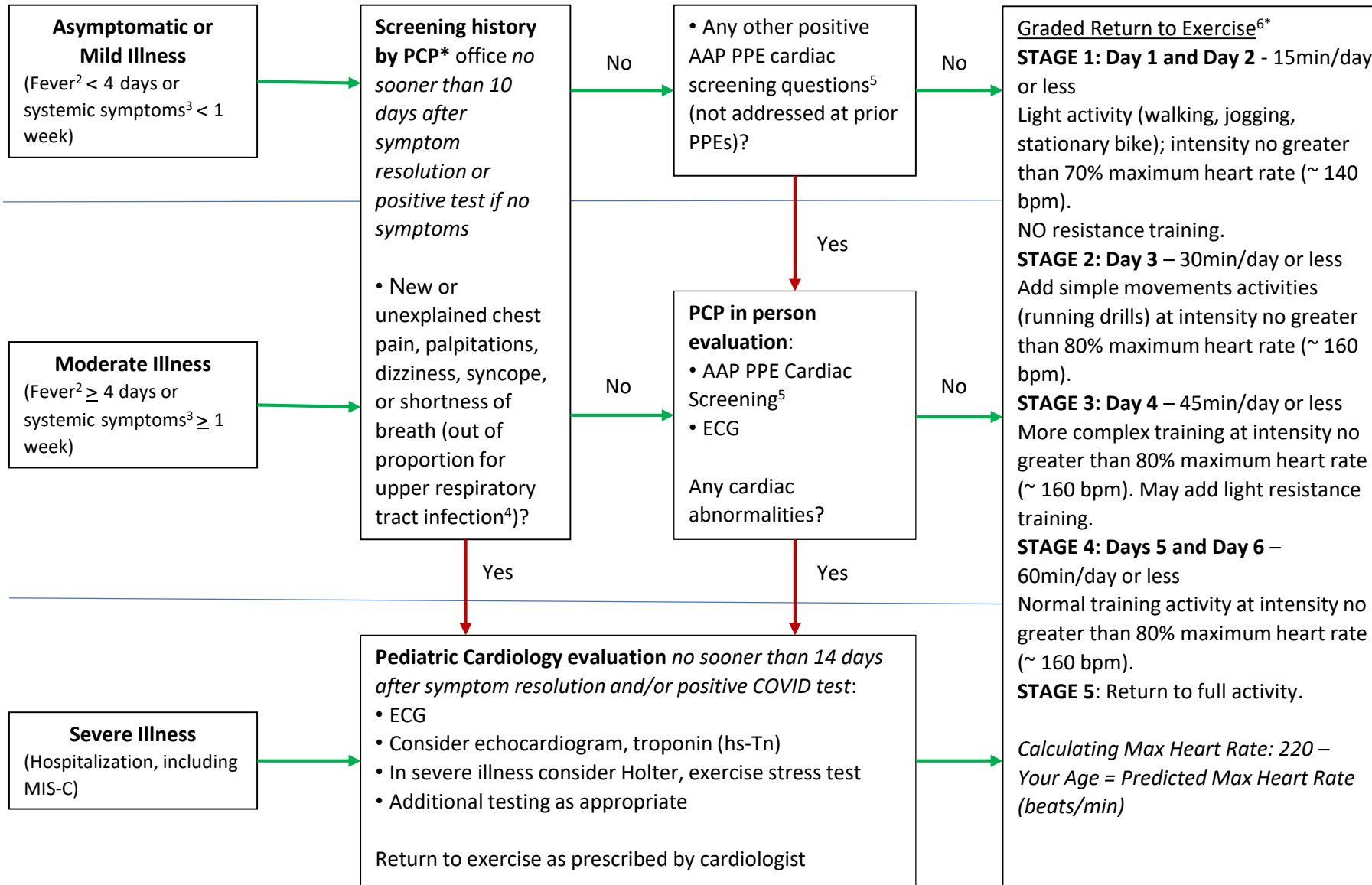
If the severity is asymptomatic or mild and all of the above are No, → instruct the patient on the graded return to exercise.



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 disease¹



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
- * See suggested tools on the webpage

Symptoms at any stage require Cardiology consult