



Return to Training and Competition After SARS-CoV-2 Infection

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the strain of coronavirus that causes coronavirus disease 2019 (COVID-19), the respiratory illness responsible for the COVID-19 pandemic.

U.S. Ski & Snowboard COVID-19 mitigation documents are designed to help reduce potential exposure and mitigate risk of viral transmission. However, they are not all encompassing and while they provide guidance for a wide range of scenarios, they do not account for every variable. COVID-19 is extremely contagious and is believed to spread mainly from person-to-person contact and can lead to severe illness and death. Until a vaccine or other therapeutics are widely available, there will be an underlying, inherent risk of COVID-19 exposure and contraction when leaving the confines of one's home. Preventative measures cannot guarantee that you will not become infected with COVID-19.

U.S. Ski & Snowboard recommends employing a symptom-based strategy for determining when athletes can return to rehab, training or competition after testing positive for or recovering from COVID-19, as outlined below. This is a two-step process that includes a medical clearance for resumption of training and/or competition, and then a graded return to activity.

1. **Medical Clearance for Return to Training/Competition**

A. ***Athletes who are not immunocompromised and were asymptomatic throughout their infection:***

- Return to training/competition when at least 14 days have passed since the date of their first positive viral diagnostic test.

B. ***Athletes with mild to moderate illness (did not require supplemental oxygen or hospitalization), and who are not immunocompromised:***

- At least 10 days have passed *since symptoms onset* **and**
- At least 72 hours have passed *since last fever* without the use of fever-reducing medications **and**
- All respiratory symptoms have resolved
- Medical Clearance* to cease isolation and to safely resume training/competition

C. ***Athletes who have had severe to critical illness or who are immunocompromised¹:***

- At least 20 days have passed *since symptoms first appeared*



- At least 72 hours have passed *since last* fever without the use of fever-reducing medications **and**
- Respiratory symptoms have resolved
- Medical Clearance* to cease isolation and to safely resume training/competition

D. ***Athletes who are immunocompromised¹*** but who were **asymptomatic** throughout their infection may return when at least 20 days have passed since the date of their first positive viral diagnostic test.

- As described in the [most recent known data and research](#), an estimated 95% of severely or critically ill patients, including some with severe immunocompromise, no longer had replication-competent virus 15 days after onset of symptoms; no patient had replication-competent virus more than 20 days after onset of symptoms.

***Medical clearance**

Concerns for athletes returning to training/competition considers infectivity to others as well as the interest of their own personal health and safety, understanding the physical stressors endured in training and competition. As knowledge continues to evolve around these issues, it is prudent that anyone recovering from COVID-19 be evaluated and receive a medical clearance that is based on the most up-to-date information in regard to COVID-19 and its impact on themselves and others. Although there are no confirmed reports of a person being reinfected with COVID-19 within three months of initial infection, additional research is ongoing. If someone who has recovered from COVID-19 has new symptoms, then the individual may need an evaluation for reinfection.

COVID-19 is associated with a number of cardiovascular complications, including myocardial injury and myocarditis, heart failure, dysrhythmias, and thromboembolisms (blood clots). Some of the medications used to treat COVID-19 also have potential cardiac complications. It is important that athletes be aware of these complications and obtain medical clearance to return to training/competition safely. As the physical stressors of training, competition and/or travel, along with altitude, exceeds what has been largely studied in those recovering from COVID-19, the U.S. Ski & Snowboard COVID-19 Task Force recommends that all athletes returning to training or competition receive medical clearance with these considerations in mind.

- A. ***For those athletes recovering from asymptomatic or mild disease***, consider an evaluation that includes at minimum:
- a. a complete history and physical exam, including measurement of oxygenation levels at rest and with exertion
 - b. EKG
 - c. Echocardiogram



- d. Serum troponin

Any abnormalities should be fully evaluated and addressed prior to returning, with a medical clearance to resume training/competition.

- B. ***For those recovering from more severe disease*** (having received supplemental oxygen or having required hospitalization):
 - a. All above (A) evaluations
 - b. D-Dimer levels
 - c. Cardiopulmonary stress test

2. Graded Return to Training/Competition (gRTT)

Graded Return to Training/Competition (gRTT) should be carefully monitored for signs of desaturation ($O_2 < 92\%$ at sea level, or “normal” for altitude), or return of any symptoms of post viral fatigue including, but not limited to: concentration or memory problems, sore throat, headache, swollen lymph nodes, unexplained muscle or joint pain.

The following symptoms should be monitored throughout the gRTT phase: symptom reporting, resting heart rate, [I-PRRS \(click for example\)](#), RPE. All return to training/competition should occur with medical staff on site for supervision.

A. Stage One: Return to Rehabilitation or Activities of Daily Living

Heart rate less than 70% of maximum or [RPE 2-3/10](#) (breathing easily and can maintain steady conversation).

Criteria to enter: athlete has received Medical Clearance to cease isolation and resume normal activities based on physician consultation, and meeting return to training timelines outlined in criteria above.

- Light aerobic exercise, less than 15 mins in duration
- Body weight and light resistance activities

Criteria to Progress: a minimum of two (2) workouts within these parameters as well as Medical Clearance, including a cardiac screen and blood work. If any symptoms return, the managing physician should be notified and consulted prior to continued progression.

B. Stage Two: Resistance Training / Moderate Aerobic Work

Heart rate less than 75% of maximum or [RPE 4-5/10](#) (breathing heavily, but can carry on a steady conversation)

- Moderate aerobic exercise:



- initially less than or equal to 30 minutes in duration, build to less than or equal to 45 minutes.
- Weight lifting below 65% 1RM (5/10 RPE) (strength endurance based), gradually increase load

Criteria to Progress: a minimum of two (2) workouts within these parameters. If any symptoms return, the managing physician should be notified and consulted prior to continued progression.

C. Stage Three: Return to Modified Training / Moderate Aerobic Work

Heart rate less than 80% of maximum or [RPE 6-7/10](#) (breathing heavily, but can carry on a steady conversation)

- Moderate aerobic exercise, **less than or equal to 60 minutes**
- Resistance training 6-7/10 RPE (3-6 rep strength or power work)

Criteria to Progress: a minimum of two (2) workouts within these parameters, as well as demonstrated 5 minute heart rate recovery below 60% MHR. If any symptoms return, the managing physician should be notified and consulted prior to continued progression.

D. Stage Four: Resume Normal Training Activities

Heart rate greater than 80% of maximum or [RPE >8/10](#) (vigorous activities, activity related shortness of breath through max efforts)

- Resumption of full spectrum aerobic, anaerobic and resistance training activities can resume.

Criteria to Progress: minimum of two (2) workouts, appropriate Sport Demands can be mimicked in a dryland scenario. Full clearance from the managing physician.

E. Stage Five: Return to Competition

Minimum of 18 days after initial symptoms or first positive test

Final release to return with watchful monitoring as determined by physician, which may or may not include return to competition dependent on the time of year.

Note on Blood Flow Restriction Training: due to the hypercoagulability associated with COVID-19, blood flow restriction (BFR) training should be avoided until the athlete is clear to enter Stage 5: Return to Competition. Prior to any BFR training, expressed permission from the managing physician should be received in writing and included in the athlete's medical record.