

# Returning to cycling after a COVID-19 infection

Elite cycling emerged from hibernation on May 21, 2020, when Andreas Leknessund won the Klatrekongen Fuel of Norway race, the first professional bike race since the European coronavirus lockdown, and an eternity since Colombian sprinter [Fernando Gaviria](#) earned the distinction of being the first notable professional rider to test positive for COVID-19 some three months earlier. While many areas of the world are still being battered by COVID-19, European professional racing is starting to delicately navigate the ever-changing conditions of this global pandemic, hopefully, en-route to a dizzying array of late summer events, culminating with the grand tours later in the fall.

Ultimately, these plans will hinge on meticulous rider and team testing, and testing will almost surely disclose more cases of COVID-19 within the peloton. This will become a new fact of life; indeed, the situation is already bubbling to the surface as other major sports try to extricate themselves from the grip of COVID-19. The [NBA](#) has been trying to create a protective “bubble” for its players – similar to but more restrictive than the [UCI’s proposed guidelines](#), and initial screening required for its athletes to enter this protective cocoon has disclosed a 5 percent (16/302 players) COVID-19 positive test rate.

[Major League Baseball](#) has also encountered similar start-up pains during their initial screening attempts with 58 players and staff testing positive, a rate of about 2 percent, affecting nearly every major league franchise (27/30 teams). The management of these situations, no matter what the sport, is straightforward and requires quarantine of the affected athletes and tracing of their significant contacts in an effort to prevent COVID-19 from permeating the remainder of the group.

But when is it safe for an athlete at any competitive level to return to unrestricted eligibility? Right now, the long-term effects of COVID 19 are not fully understood, and current recommendations are based largely on expert opinion rather than objective data. The situation is fluid and ever-changing, but one thing experts do agree on is the need for expanded testing.

The standard of care being used by all major sports for detecting active COVID-19 infection in athletes is the SARS CoV 2 RT-PCR nasal swab, which detects viral genetic material being shed from the nasal membranes. COVID-19 antibody testing, which identifies recovered and presumably immune athletes, has also been proposed, however, this approach should be used with great caution, since the duration and extent of immunity to future COVID-19 infection remains unclear, and cases of possible re-infection are already beginning to surface. The presence of “protective” antibodies in this unique disease may not be the “golden ticket” to immunity which many had hoped for, and therefore most experts still insist standard precautions apply, even if antibodies are detected.

SARS CoV 2 (commonly called the coronavirus or COVID-19), is capable of producing a myriad of symptoms, but is primarily a respiratory virus – Severe Acute Respiratory Syndrome – but what is less known is that it also commonly involves the cardiovascular system. Hence, those patients with preexisting problems such as high blood pressure, diabetes, and underlying heart disease have a significantly higher

mortality risk. Conversely, young and physically fit athletes seem to be generally less impacted, and are usually among the 80 percent majority of COVID-19 patients who show only mild symptoms, or even no symptoms at all.

The challenge in properly assessing these minimally effected patients is that most of the data regarding heart effects in COVID-19 are garnered from hospitalized patients. Thus, the true prevalence of COVID-19-induced cardiac injury, as well as the short and longer-term risks in less severely infected individuals, remains a black box. In fact, mild cases of COVID-19 can often be easily missed entirely, since nonspecific symptoms of fatigue, muscle aches, and reduced exercise capacity – without fevers or breathing issues – in trained athletes are often simply chalked up to over-training.

Returning to competition following recovery from COVID-19 infection can be a tricky endeavor. Once an athlete has fully recovered from a breathing standpoint, and is no longer experiencing other flu-like symptoms such as fatigue and muscle aches, he or she is likely to want to return to training and competition. But potential heart effects of the virus can linger and must be carefully considered. In general, the risk of heart involvement increases in relation to the severity of symptoms during the acute phase of the COVID-19 illness. For example, patients who were hospitalized have about a 25 percent chance of serious heart-related problems – anything from congestive heart failure to significant heart rhythm problems, due to *myocarditis*, or inflammation of the heart muscle.

In contrast, most other viral illnesses carry only about a 1 percent risk of heart involvement, but it appears that COVID-19 potentially presents much higher risks. Myocarditis probably occurs for two reasons during a COVID-19 infection: direct injury of heart muscle cells by the virus, and secondary injury of the muscle cells caused by cytokines – the heavy-duty “artillery” released by our immune systems to fight infection. In some patients, COVID-19 has been shown to cause an artillery barrage, a hyper-inflammatory state, and the toxic effect of this cytokine storm has been implicated in widespread tissue damage to multiple organs, including the heart and lungs.

Following a complete recovery of the typical symptoms from COVID-19, the presence or absence of cardiac involvement is probably the most important determinant governing a successful return to competition. Since myocarditis is one of the leading causes of [sudden cardiac death \(SCD\)](#) in up to 20 percent of young athletes (

Cyclists are unique competitors because they typically perform the most prolonged exercise pattern – more hours per day and more days per year than most other athletes – often functioning at near maximum intensity. During a typical high-octane workout, cyclists often sustain elevated heart rates for extended periods of time in order to produce the needed cardiac output. When high-intensity aerobic workouts performed near peak efficiency are coupled with sustained elevations in heart rate, dynamic stress, or a “volume load” on the heart results. Long tempo efforts, routinely punctuated by intense anaerobic dashes, create static stress, exposing the heart to a “pressure load” because of sustained increases in blood pressure. These types of stress are dangerous if a COVID-19 positive athlete developed cardiac effects, and further heart damage could occur if that person returns to intensive exercise too soon. In turn, this could lead to an increased short-term risk of congestive heart failure, and an increased long-term risk of potentially lethal heart rhythm problems.

In terms of COVID-19 positive athletes returning to action, the [American College of Cardiology \(ACC\)](#) and the [European Society of Cardiology \(ESC\)](#) offers helpful guidelines in this regard based on expert consensus opinion:

- COVID-19-positive screened athletes with no symptoms should rest for two weeks (no intense or competitive exercise), with a gradual return to activity as long as no symptoms develop. European guidelines specifically suggest that the athlete should also exhibit a normal resting ECG (electrocardiogram).
- COVID-19-positive athletes with mild to moderate symptoms require the same two weeks of rest followed by a physician visit. Lab testing during that visit should include a hs-Troponin level – an indicator of possible myocarditis. Diagnostic testing should include an ECG and an echocardiogram (an ultrasound picture of the heart) to confirm normal heart pumping function and to look for any areas of damage. European guidelines also suggest an exercise treadmill test. Normal test results are great news and allow for a gradual return to competition. However, abnormal test results suggest the possibility of myocarditis indicating a more complicated return to sport. In this scenario, an athlete should realistically expect to be out of commission for three to six months. Additional testing should include a cardiac MRI scan to look for scar tissue which could trigger dangerous heart rhythms associated with SCD, and screening for any potential heart rhythm problems. Competition should only be permitted if and when subsequent testing showed that the athlete’s heart returned back to normal.
- COVID 19-positive athletes with severe symptoms or who have been hospitalized should be managed much more aggressively, with an emphasis on survival rather than a speedy return to competition. They would likely need to complete their prerequisite testing prior to, or shortly after discharge from the hospital. Return to competition should necessarily be very gradual and carefully monitored and individualized based on symptom resolution, reconditioning, and the presence/absence of cardiac involvement. A more prolonged convalescence would be expected.

COVID-19 is a very real disease with sometimes serious — and potentially lethal — consequences. Unfortunately, many times our reactions are complicated by panic, fear, and misinformation while ignoring the kind of sound science which is essential in decision-making. Although many of the long-term consequences of COVID-19, the novel coronavirus, are not yet clearly understood, guidelines for its short-term management, developed by expert consensus, are currently available.

Prevention and risk mitigation will remain key components to managing this pandemic. Therefore, as cyclists, our behavior both on and off the bike is critically important. Airborne transmission is the primary route for the spread of COVID-19, and certain mitigation measures such as [mask-wearing](#) have been unequivocally proven to be the difference in shaping the trends of the pandemic. This protective measure significantly reduces the number of infections and other mitigation practices, such as social distancing, are insufficient by themselves to protect the public.

Despite all of these cautions, regular exercise is still clearly encouraged and beneficial – to promote good cardiovascular health and to relieve general “quarantine fatigue.” But for athletes who fear that they may

have been exposed to COVID-19, or who have either exhibited symptoms or have reason to believe that they may be asymptomatic carriers, testing and adherence to the above guidelines is strongly recommended. Just because you start to feel better doesn't necessarily mean that you are totally out of the woods.

And cyclists, in particular, should also remain aware of the risks of group riding; for more information on this, see the practical guidelines suggested by [USA Cycling](#) or the results of [other studies](#) which suggest much greater physical distancing while cycling. Be smart and follow these guidelines, but most importantly, recognize flu-like symptoms, and stop if you don't feel well. Be sure to consult a medical professional if you feel ill, and be aware that some of the effects of COVID-19 may be less visible or even silent, but still potentially dangerous to you over the longer-term.

*By Dr. William Apollo and Steve Maxwell, July 22nd, 2020.*

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