The BASES Expert Statement on Graduated Return to Play Following Covid-19 infection

Produced on behalf of the British Association of Sport and Exercise Sciences by Dr Anita Biswas, Dr Niall Elliott, Dr Rhodri Martin, Dr Neil Heron, Dan Grimstead, Joshua Wass and Dr Adam Grainger FBASES.

Introduction and background

Sport and exercise scientists have a role to play in supporting people returning to exercise after illness or injury, particularly when there has been a prolonged period of incapacity or inactivity during which fitness and conditioning levels will have significantly deteriorated (Sarto *et al.,* 2020). This expert statement will be of interest to sport and exercise scientists and those working with elite and sub-elite athletes who have been affected by symptoms of Covid-19 and are trying to return to their pre-illness levels of fitness and performance. As Covid-19 is an evolving medical concern, this statement has been written recognising that understanding of the long-term impacts of this disease are limited, but it includes input from experts from a variety of medical specialities who are working on the frontline in the UK National Health Service and were consulted in the development of the Graduated Return to Play document referred to in this article.

Background and evidence

Covid-19 is a medical syndrome caused by the novel coronavirus SARS CoV-2, which was first reported in Wuhan in China at the end of 2019. The disease has now spread widely through Europe and to most countries around the world. The first described condition was of a severe pneumonia but reports of progression to multi-organ failure and death has resulted in significant restrictions to populations around the world, including elite athletes, who have been unable to train in the way and in the venues that they normally would. The majority of people who are infected with the virus have mild symptoms or have no symptoms at all. This is particularly common in younger people with no underlying medical conditions.

Common symptoms include fever, persistent dry cough, loss of taste or smell, and fatigue. However, they vary significantly and include very common symptoms like sore throat, nausea and diarrhoea.

Conditions such as underlying Diabetes mellitus, reduced immune function and obesity are linked with an increased risk of more severe disease, as is being male, of Black and Minority Ethnic and aged over 65 years old (Williamson *et al.,* 2020).

Impact of Covid-19 on elite athletes

Many elite athletes and professional sportspeople have been severely restricted in the training that they have been able to do during the period of lockdown. With gyms, swimming pools and training venues closed, their training programmes have had to be modified so that they can be completed alone and at home.

Whilst most elite athletes would expect to be affected by only mild to moderate symptoms, full recovery from the infection has often taken several weeks in our experience. Much is still unknown regarding the longer-term complications of the infection, however, there is emerging evidence that all systems including the cardiovascular (Dores & Cardim, 2020) and respiratory systems may be affected (Hull *et al.,* 2020). As a result of these and other possible effects of the virus, the return of an athlete to training should be overseen or at least signed off by a medical doctor where at all possible. Despite the early suggestion that Covid-19 is "just a bad cold," ongoing fatigue and breathlessness often feature and can limit exercise tolerance, therefore, delaying return to even relatively low intensity exercise such as walking.

Most of those with Covid-19 symptoms gradually recover, however, some suffer a rapid deterioration at around days 5-8 with worsening symptoms, severe breathlessness, hypoxia and multi-organ failure due to a huge inflammatory reaction known as a cytokine storm (Coperchini *et al.,* 2020). This response results in admission to hospital and often to the Intensive Care Unit. In this group, death may occur, or any recovery can be expected to take many months. It is due to this potential deterioration, as well as the period of self-isolation necessary to limit the infection of others, that return to exercise should be delayed for at least 10 days from the onset of first symptoms.

Gradual return to play after Covid-19

Return to exercise after any form of viral illness requires a graduated and well-structured plan, particularly in the elite athlete, where there is often pressure to return to peak performance as quickly as possible. Progression should be based on the response to training at each stage, with any negative response resulting in a return to the previous symptom-free level of activity. Ongoing symptoms or failure to progress through the rehabilitation programme should trigger a medical review and further investigation. Elite athletes should not be encouraged to train through symptoms as this will delay their return to full performance.

The Home Country Sports Institutes have collaborated to develop guidance for Healthcare Professionals about a *Graduated Return to Play* in elite athletes (Elliott *et al.,* 2020), with some key considerations from this medically led process being:

- Athletes should not start to return until at least 10 days following onset of symptom and should be 7 days symptom free.
- In most cases, 7 days is the minimum time to progress to full training, especially in sports of an aerobic nature. Less physically intense sports, like golf or lawn bowls, may progress quicker. Initial experiences of the authors note that some athletes take over 3 weeks to recover and a few take many weeks, even after mild symptoms.
- Before considering a return to training, the athlete must be able to complete all activities of daily living without excessive fatigue and/or breathlessness and walk a minimum of 500 m on the flat without getting breathless.
- The athlete must have stopped all treatments that may mask symptoms, e.g. paracetamol.

As many athletes are low risk for severe symptoms, this Graduated Return to Play document has been developed on the basis of mild to moderate symptoms. Anyone experiencing symptoms severe enough to require hospitalisation should only be managed by a multi-disciplinary team, including medical specialists.

Monitoring the following may help to assess response:

- Resting heart rate (RHR)
- Rated Perceived Exertion (RPE)
- Sleep, stress, fatigue and muscle soreness, e.g. using questionnaire
- Fatigue and breathlessness
- Injury-Psychological Readiness to Return to Sport (I-PRRS) relates to psychological readiness to return to sport (Glazer, 2009).

Where relevant, monitoring using specific medical tests such as oxygen saturations, blood and lung function tests may be necessary. Other allied disciplines such as nutrition, physiology and technical coaches should also usually be involved.

What is the role of sport and exercise scientists and coaches in the rehabilitation process after Covid-19?

Sport and exercise scientists are a vital part of the multi-disciplinary team involved in the rehabilitation of any athlete and post-Covid-19 is no different. However, due to the nature of the potential complications of the disease, a cautious approach is advised, including early medical input, with practitioners strongly advised to ask a doctor to oversee the rehabilitation of all athletes post-Covid-19, with good communication between the coach/athlete and medic as an essential part of the care of the athlete.

The sports and exercise scientist may supervise the programme whilst reporting response to training and any new or ongoing symptoms or adverse physiological signs, such as abnormal heart rate responses, drop in oxygen saturations if measurable or increased breathlessness, to the doctor. It should be recognised by the practitioner that the previous fitness capability of the athlete would be a poor guide as to their ability to complete a session, so close observation of the response to a prescribed session should occur.

Conclusions and recommendations

The Graduated Return to Play of an athlete after mild-moderate Covid-19 symptoms should be slow and steady, involving close monitoring and appropriate response to any symptoms or lack of progress. It is recommended that a medical doctor oversees this process due to the complex and possibly severe complications of a new infection that is not yet fully understood. Sport and exercise scientists and strength and conditioning coaches have an important part to play in this process and their recognition of the possible risks will ensure that athletes return to play in a safe and stepwise manner. ■

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