

# Balancing act: when is an elite athlete who has had COVID-19 safe to return to play? When does prudent investigation go offside into overmedicalising?

Harald T Jorstad ,<sup>1</sup> Joost G van den Aardweg<sup>2</sup>

Sport and exercise medicine (SEM) physicians are faced with the challenge of advising elite athletes with (suspected) COVID-19 wishing to return to play. Elite athletes are markedly different from the typical hospitalised patients with COVID-19. Elite athlete populations have a low prevalence of overweight and obesity, hypertension and smoking, and of lifestyle-related diseases, such as atherosclerotic coronary artery disease, congestive heart failure and obstructive lung disease, all of which are associated with severe COVID-19.<sup>1-3</sup> However, from an athlete's point of view, COVID-19 sequelae leading to even a small long-term

decrease in physical performance capacity can be career limiting.

## RETURN-TO-PLAY GUIDE FROM EXPERTS IN THE UK

To assist SEM physicians in their medical support of athletes returning to intensive training and competitive sport, this issue of the *British Journal of Sports Medicine* includes a practical guide by London's Professor Mathew Wilson *et al*.<sup>4</sup> In a comprehensive, multidisciplinary document, they propose a clear, disease-oriented clinical pathway for cardiac and pulmonary medical decision making to support return to play. Laudable is that Wilson *et al* also include psychological factors that should be considered in the postlockdown setting where return to play takes place.

They include an integrated flowchart which includes both cardiac and pulmonary considerations. In short, no additional diagnostic steps are recommended in athletes without signs or symptoms of

COVID-19. In athletes who were diagnosed with COVID-19, even if the athlete has recovered completely, Wilson and colleagues recommend cardiac evaluation, including a 12-lead ECG and transthoracic echocardiogram. In patients with persistent symptoms ( $\geq 14$  days), extensive diagnostic testing is recommended, with cardiac MRI as the first-line examination, followed by a cardiopulmonary exercise test and 24-hour Holter monitoring. Pulmonary investigations in athletes with persistent symptoms include a chest X-ray and spirometry. If pulmonary abnormalities or thromboembolic complications are suspected, a CT-scan and a cardiopulmonary exercise test are recommended. If an athlete has been hospitalised, a comprehensive cardiopulmonary evaluation is recommended.

## HOW MUCH IS TOO MUCH (INVESTIGATION)?

In this logical and stepwise approach for patients who have been diagnosed with COVID-19, potential pulmonary and cardiac COVID-19 sequelae are rigorously investigated. However, as with every screening, in this comprehensive approach hides the risk for overmedicalisation. First, if the ECG, echocardiogram, chest X-ray and spirometry are normal, the diagnostic yield of a cardiopulmonary exercise test is limited to deconditioning, chronic pulmonary embolism or arrhythmias not found during Holter monitoring. Second, there are few specific echocardiographic findings pointing to COVID-19 cardiac

<sup>1</sup>Heart Center, Amsterdam University Medical Centres, Amsterdam, Noord-Holland, The Netherlands

<sup>2</sup>Pulmonary Medicine, Amsterdam University Medical Centres, Amsterdam, Netherlands

**Correspondence to** Dr Harald T Jorstad, Cardiology, Amsterdam University Medical Centres, Amsterdam 1100DD, The Netherlands; [h.t.jorstad@amsterdamumc.nl](mailto:h.t.jorstad@amsterdamumc.nl)

involvement, even in individuals with severe disease.<sup>5</sup> Third, echocardiographic differentiation between COVID-19 cardiac involvement and cardiac adaptation secondary to sports and exercise is challenging, even in expert settings, when mildly reduced ventricular ejection fractions or ventricular dilatation are found. However, in a non-athlete population, extensive short-term cardiac involvement after COVID-19 has been demonstrated using MRI.<sup>6</sup> Whether these findings can be extrapolated to athletes is uncertain. Furthermore, there are currently no data on whether intensive sports and exercise can have a negative impact on outcomes if comparable cardiac involvement is found in athletes. Fortunately, to date, there are no reports of a drastic increase in sudden cardiac arrest or death in elite athletes, neither in peer-reviewed journals nor in mainstream media. Finally, the optimal approach to maximise safety in elite sports would be to establish an international registry with athlete-specific cardiac and pulmonary findings, and long-term consequences of post COVID-19 return to play.

When performing large-scale and comprehensive screenings and investigations, false-positive findings are likely to occur, especially as COVID-19-specific cardiac findings have not yet been reported in the athlete (or generally healthy) population. This could lead not only to a regrettable delay in return to play but also to a cascade of further diagnostic procedures, and the risk of (further) incidental findings. For the elite athlete, the psychological burden of recovery from COVID-19 should also be taken into account, especially if exacerbated by unclear findings.

When considering return to play on a global scale, both the financial burden and the consumption of healthcare resources, in settings where healthcare systems are

already under considerable stress from the current pandemic, should be kept in mind. This is especially relevant when performing extensive diagnostic testing in individuals with an asymptomatic or mild course of COVID-19 or with non-specific screening findings.

SEM physicians, with their clinical skills and the benefit of general knowledge across the broad field of SEM, are ideally placed to guide the balance between appropriate diagnostic testing and overmedicalisation. As data accrue on the sequelae of COVID-19 in elite athlete populations, further stratification may become possible—which athletes need which tests and who can safely be cleared for speedy return to sport.

Identifying specific symptoms, signs or findings that are associated with adverse (performance) outcomes will assist in refining management from a *disease-oriented* approach to a (more customised) *symptom-oriented* approach; the practical guide by Wilson *et al* is a first and important step in this direction. With a symptom-oriented approach, there is no demand for highly specialised pulmonary or cardiac expertise for SEM physicians, overmedicalisation is reduced, and the athlete's perspective remains central.

**Contributors** Both authors declare that their contributions include substantial contributions to the conception or design of the work, drafting the work or revising it critically for important intellectual content, final approval of the version published, and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Provenance and peer review** Not commissioned; internally peer reviewed.

This article is made freely available for use in accordance with BMJ's website terms and conditions for the duration of the covid-19 pandemic or until otherwise determined by BMJ. You may use, download and print the article for any lawful, non-commercial purpose (including text and data mining) provided that all copyright notices and trade marks are retained.

© Author(s) (or their employer(s)) 2020. No commercial re-use. See rights and permissions. Published by BMJ.



**To cite** Jorstad HT, van den Aardweg JG. *Br J Sports Med* 2020;**54**:1125–1135.

Accepted 16 August 2020

Published Online First 24 August 2020



► <http://dx.doi.org/10.1136/bjsports-2020-102710>

*Br J Sports Med* 2020;**54**:1125–1135.  
doi:10.1136/bjsports-2020-103259

#### ORCID iD

Harald T Jorstad <http://orcid.org/0000-0003-3617-3256>

#### REFERENCES

- Zhou F, Yu T, Du R, *et al*. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet* 2020;395:1054–62.
- D'Ascenzi F, Caselli S, Alvino F, *et al*. Cardiovascular risk profile in Olympic athletes: an unexpected and underestimated risk scenario. *Br J Sports Med* 2019;53:37–42.
- Xie J, Covassin N, Fan Z, *et al*. Association between hypoxemia and mortality in patients with COVID-19. *Mayo Clin Proc* 2020;95:1138–47.
- Wilson MG, Hull JH, Rogers J, *et al*. *Returning-to-play in elite athletes during the COVID-19 pandemic: a practical guide*, 2020.
- Szekely Y, Lichter Y, Taieb P, *et al*. Spectrum of cardiac manifestations in COVID-19: a systematic echocardiographic study. *Circulation* 2020;142:342–53.
- Puntmann VO, Carerj ML, Wieters I, *et al*. Outcomes of cardiovascular magnetic resonance imaging in patients recently recovered from coronavirus disease 2019 (COVID-19). *JAMA Cardiol* 2020. doi:10.1001/jamacardio.2020.3557