

Infographic. Clinical recommendations for return to play during the COVID-19 pandemic

Authors: Herbert Löllgen¹, Norbert Bachl^{1,2,3,4}, Theodora Papadopoulou^{1,2,5,6}, Andrew Shafik^{7,8}, Graham Holloway⁵, Karin Vonbank⁹, Nigel Jones^{5,10}, Xavier Bigard^{1,2,11}, David Niederseer¹², Joachim Meyer^{13,14}, Borja Muniz-Pardos¹⁵, Andre Debruyne^{1,2}, Petra Zupet¹, Juergen M. Steinacker^{1,2,16}, Bernd Wolfarth^{2,17}, James L. J. Bilzon^{2,18}, Anca Ionescu¹, Michiko Dohi^{2,19}, Jeroen Swart^{2,20}, Victoriya Badtieva^{2,21,22}, Irina Zelenkova^{15,22}, Maurizio Casasco^{1,2,23}, Michael Geistlinger^{2,24}, Luigi Di Luigi^{2,25}, Nick Webborn²⁶, Patrick Singleton²⁷, Mike Miller²⁷, Fabio Pigozzi^{2,28,29}, Yannis P. Pitsiladis^{1,2,30}

Corresponding author:

Professor Yannis Pitsiladis

Collaborating Centre of Sports Medicine, University of Brighton

Eastbourne

UK

Email: y.pitsiladis@brighton.ac.uk

Affiliations:

¹ European Federation of Sports Medicine Associations (EFSMA), Lausanne, Switzerland

² International Federation of Sports Medicine (FIMS), Lausanne, Switzerland

³ Institute of Sports Science, University of Vienna, Vienna, Austria

⁴ Austrian Institute of Sports Medicine, Vienna, Austria.

- ⁵ British Association Sport and Exercise Medicine, Doncaster, UK
- ⁶ Defence Medical Rehabilitation Centre (DMRC), Loughborough, UK
- ⁷ NHS South Tyneside and Sunderland Foundation Trust, Sunderland, UK
- ⁸ Newcastle Thunder Rugby, Newcastle, UK
- ⁹ Department of Pneumology, Pulmonary Function Laboratory, Medicine Clinic (KIMII), University of Vienna, Vienna, Austria
- ¹⁰ British Cycling and University of Liverpool, UK
- ¹¹ Union Cycliste Internationale (UCI), Aigle, Switzerland
- ¹² Heart Centre of the University of Zurich, Zurich, Switzerland
- ¹³ Lung Center Bogenhausen-Harlaching, Munich Clinic, Germany
- ¹⁴ German Respiratory Society (DGP), Berlin, Germany
- ¹⁵ GENUD (Growth, Exercise, Nutrition and Development) research group, University of Zaragoza, Zaragoza, Spain
- ¹⁶ Division of Sports and Rehabilitation Medicine, Ulm University Hospital, Ulm Germany
- ¹⁷ Department of Sports Medicine, Humboldt University and Charité University School of Medicine, Berlin, Germany
- ¹⁸ Department for Health, University of Bath, Bath, UK
- ¹⁹ Sport Medical Center, Japan Institute of Sports Sciences, Tokyo, Japan
- ²⁰ UCT Research Unit for Exercise Science and Sports Medicine, Cape Town, South Africa
- ²¹ I.M. Sechenov First Moscow State Medical University (Sechenov University), Ministry of Health of Russia, Moscow, Russian Federation.
- ²² Moscow Research and Practical Centre for Medical Rehabilitation, Restorative and Sports Medicine, Moscow Healthcare Department, Moscow, Russian Federation.

²³ Italian Federation of Sports Medicine (FMSI), Rome, Italy

²⁴ Unit International Law, Department of Constitutional, International and European Law.
University of Salzburg, Salzburg, Austria

²⁵ Unit of Endocrinology, Department of Movement, Human and Health Sciences,
University of Rome “Foro Italico”, Rome, Italy

²⁶ School of Sport and Service Management, University of Brighton, Eastbourne, UK

²⁷ World Olympians Association, Lausanne, Switzerland

²⁸ University of Rome “Foro Italico”, Rome, Italy

²⁹ Villa Stuart Sport Clinic, FIFA Medical Center of Excellence, Rome, Italy

³⁰ Collaborating Centre of Sports Medicine, University of Brighton, Eastbourne, UK

COVID-19 and return to play

The world of sport has recently returned to training and competition following suspension due to the COVID-19 pandemic. It is concerning that a number of athletes have tested positive for COVID-19 after returning to competition [1]. Numerous authors have attempted to address return to play given the importance and complexity of the issue, with notable attention on possible cardiac implications [2–6].

Scope of the infographic

The specific recommendations shown in the present infographic (Infographic 1) have been generated by a panel of international experts and represent a compilation of the numerous approaches used to inform resumption of regular sports during the COVID-19 pandemic. Despite the different regulations around the world and the particular characteristics of each sport, it is essential to provide informative, consistent and specific guidance for safe return to training and competition at this most difficult time.

Recommendations

COVID-19 is a systemic disease affecting the endothelium and all organs, especially the heart and lungs with more severity and clinical significance. Therefore, our recommendations for safe return to sport are based on a comprehensive clinical evaluation (i.e., cardiac and respiratory) and have been designed for six different groups according to the level of exposure to COVID-19. These groups are based on a previous report by Phelan et al. [3], which are applicable to both leisure time and professional athletes. It is imperative that group allocation is determined beforehand through a medical examination performed in cooperation with a respiratory physician and/or cardiologist. Specific

recommendations for each group are provided based on current evidence and expert opinion (see Table 1).

Special considerations

The resumption of sporting activity should be determined on a case-by-case basis and consider the individual situation of the athlete, including pre-existing conditions, as well as the type of sport and the risk of infection from other athletes (e.g., increased risk in contact/team-sports). Ideally, the final decision to return to play will be based on the results of the individual assessment in consultation with the sport and exercise medicine physician, specialists in pulmonary medicine and sport cardiologists (or extended multidisciplinary team), coaches and training specialists. After a prolonged period of interruption in sport caused by more severe health issues, increments in training should be gradual, individualised and supervised by periodic monitoring of cardiac and respiratory markers to detect potential signs and symptoms. Although the present recommendations are focused primarily on pulmonary and cardiac assessments, given the wider health-related issues caused by COVID-19, more comprehensive evaluation including psychological status, examination of muscular function and other suspected collateral issues should be considered to provide more detailed and thorough information for safe return to play.

Further essential reading

For more detailed description of the risk factors and symptoms that could inform the decision to return to sport as safely as possible, consult Baggish et al. [5] Carmody et al. [7] and Niess et al. [8].

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References

- 1 Fuller R. Novak Djokovic must 'feel responsibility' at coronavirus at Adria Tour, says Evans - BBC Sport. <https://www.bbc.com/sport/tennis/53131665> (accessed 27 Jun 2020).
- 2 Elliott N, Martin R, Heron N, *et al.* Infographic. Graduated return to play guidance following COVID-19 infection. *Br J Sports Med* Published Online First: 22 June 2020. doi:10.1136/bjsports-2020-102637
- 3 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 First: 2020. doi:10.1001/JAMACARDIO.2020.2136
- 4 EFSMA Recommendations for sports and exercise medicine physicians: Resumption of regular sports activity after COVID-19 pandemic. <https://www.efsm.eu/newsevents/news-events/247-efsma-recommendations-for-sports-and-exercise-medicine-physicians-resumption-of-regular-sports-activity-after-covid-19-pandemic.html> (accessed 27 Jun 2020).
- 5 Baggish A, Drezner JA, Kim J, *et al.* Resurgence of sport in the wake of COVID-19: cardiac considerations in competitive athletes. *Br J Sports Med* 2020;:bjsports-2020-102516.
- 6 Dores H, Cardim N. Return to play after COVID-19: A sport cardiologist's view. *Br J Sports Med* Published Online First: 21 May 2020. doi:10.1136/bjsports-2020-102482
- 7 Carmody S, Murray A, Borodina M, *et al.* When can professional sport recommence safely during the COVID-19 pandemic? Risk assessment and factors to consider. *Br J Sports Med* 2020;54:946–8.
- 8 Niess AM, Bloch W, Friedmann-Bette B, *et al.* Position Stand: Return to Sport in

the Current Coronavirus Pandemic. *Ger J Sport Med* 2020;**71**:E1–4.

Infographic 1. Recommendations for return to sport during the COVID-19 pandemic.

Table 1: Clinical recommendations for testing individual groups

Recommendations	Groups					
	1	2	3	4	5	6
Tested randomly or by finding antibodies. Only possible PPE or standard exam	X					
Need for usual check-up including ECG and echo		X				
Tested following contact with somebody who was positive or tested because having typical signs and symptoms and out of hospital treatment		X				
In-hospital treatment but quarantine at home			X	X		
For diagnosis only			X			
Treatment with close monitoring due to symptoms but normal ward with isolation and quarantine				X		
Need thorough pre-participation exam, CPET, echo and other necessary assessments			X	X		
Serious illness with difficult progression and intensive care unit (ICU) without artificial ventilation					X	X
Artificial ventilation						X
Need thorough examination before discharge (e.g., MRI)					X	X