university of groningen

University Medical Center Groningen

University of Groningen

Infographic. COVID-19 RT-PCR testing for elite athletes

Rankin, Alan; Massey, Andrew; Falvey, Éanna Cian; Ellenbecker, Todd; Harcourt, Peter; Murray, Andrew; Kinane, Denis; Niesters, Bert; Jones, Nigel; Martin, Rhodri

Published in:
British Journal of Sports Medicine

DOI:
10.1136/bjsports-2020-103751

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2021

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):
Rankin, A., Massey, A., Falvey, É. C., Ellenbecker, T., Harcourt, P., Murray, A., Kinane, D., Niesters, B., Jones, N., Martin, R., Roshon, M., McLarnon, M. E. D., Calder, J., Izquierdo, D., Pluim, B. M., Elliott, N., & Heron, N. (2021). Infographic. COVID-19 RT-PCR testing for elite athletes. *British Journal of Sports Medicine*, *55*(14), 818-820. https://doi.org/10.1136/bjsports-2020-103751

Copyright
Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the “Taverne” license. More information can be found on the University of Groningen website: https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment.

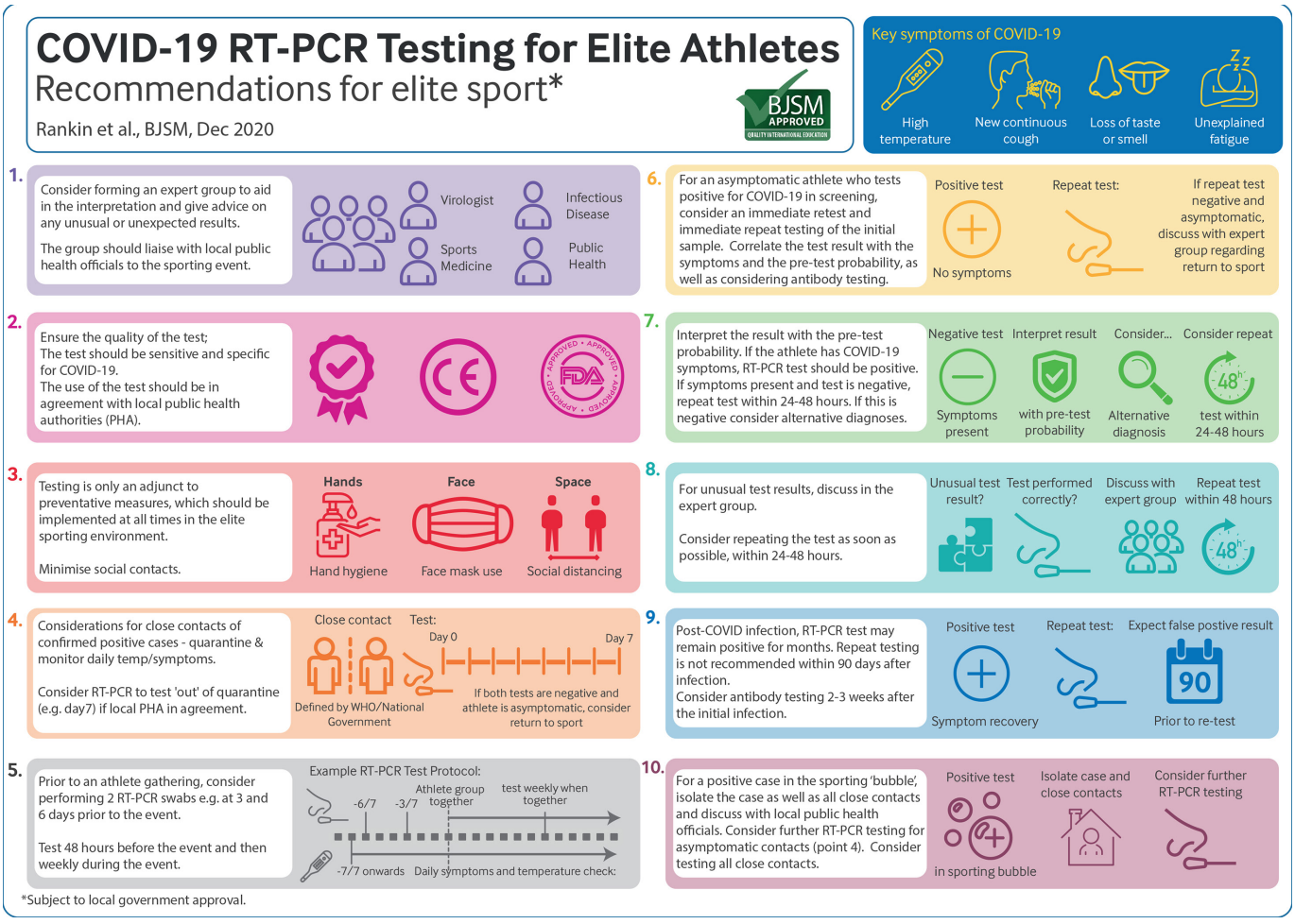
Take-down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): http://www.rug.nl/research/portal. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Download date: 04-06-2022

Infographic. COVID-19 RT-PCR testing for elite athletes

Alan Rankin ,[1,2] Andrew Massey ,[3] Éanna Cian Falvey ,[4,5] Todd Ellenbecker,[6] Peter Harcourt,[7] Andrew Murray ,[8,9] Denis Kinane,[10] Bert Niesters,[11] Nigel Jones,[12] Rhodri Martin,[13,14] Michael Roshon,[15] Michael Edmund David McLarnon ,[16] James Calder,[17] Dionisio Izquierdo,[18] Babette M Pluim ,[19,20] Niall Elliott ,[21] Neil Heron [22]



This infographic outlines evidence-based recommendations on COVID-19 reverse transcriptase PCR (RT-PCR) testing in elite sport settings, aiming to protect personal and population health, and acknowledging resources and expertise that are often available in elite sport. Public health recommendations vary by country and region, and protocol decisions should be made in consultation with relevant public health authorities.

FORM AN EXPERT GROUP

An expert, multidisciplinary group with input from clinical virology, microbiology, public health, infectious diseases and sports medicine provides optimal implementation and interpretation of testing.

PREVENTION IS BEST

Interventions to prevent COVID-19 transmission should be implemented consistently[1 2] and should include

- Effective hand hygiene.
- Physical distancing: athletes should minimise discretionary social contacts and maintain a distance of at least one metre from others.
- Wearing a mask at all times when around others, especially indoors.[3]
- Prioritising outdoor over indoor activity where possible.

COVID-19 AND RT-PCR TESTING

The current gold standard of testing is RT-PCR testing.[4–6] The test is highly sensitive and specific to SARS-CoV-2 viral RNA in laboratory conditions.[2] Test results should be interpreted on the basis of the pretest probability, previous test results and clinical history. Test sensitivity and specificity will rely on the (1) quality and location of swabbing; (2) testing equipment and reagents, and (3) laboratory expertise.

Close contacts[7] to a positive-testing athlete should be isolated and proceed with daily monitoring for symptoms and temperature, and where available testing. If the contact is asymptomatic

Br J Sports Med: first published as 10.1136/bjsports-2020-103751 on 17 January 2021. Downloaded from http://bjsm.bmj.com/ on February 24, 2021 at University of Groningen. Protected by copyright.

and COVID-19 RT-PCR tests are negative at 7 hours of follow-up, the close contact could be considered for a return to sport, depending on discussions with local public health authorities.

TESTING AND ELITE ATHLETE GATHERINGS

Prior to a gathering of elite athletes, for example, at a training camp or competition, all athletes should have regular symptom checks and should undergo RT-PCR or other screening for the virus. For the first gathering, testing 6 and 3 days prior to the event is recommended, as well as testing as close to the event as logistically possible, ideally within 48 hours of the meeting. Interval (eg, weekly) PCR testing for the duration of the gathering should be considered.

MANAGING A POSITIVE TEST

Positive tests should be managed according to national and local public health guidance, but elite sport can often provide additional medical and testing support. The positive case, as well as all close contacts, should be isolated as soon as possible, and contact tracing should be undertaken.

If an asymptomatic athlete tests positive in screening, they should be isolated but retested to ascertain whether the result represents a true or false positive. False positives are less likely when the prevalence of COVID-19 is high. In a symptomatic individual, a positive result is considered a true positive. Careful attention should be paid to the PCR cycle threshold (Ct) and the gene expression of the result, as this correlates strongly with cultivable virus.[4] A test with a high Ct (>30, and especially >35) may not indicate current infectivity,[4 5] although the viral load may rise in subsequent days.

INTERPRETING A NEGATIVE TEST IN AN ATHLETE

If an athlete has symptoms indicative of coronavirus (eg, loss of taste/smell, dry cough or fever) but test results are negative, repeat testing is recommended to exclude a false negative, especially if there is a high prevalence of COVID-19 activity. An alternative diagnosis with testing for other viral aetiologies should also be considered. Unusual test results should be discussed within the expert group.

RETESTING POST-COVID INFECTION

Viral RNA can persist in individuals beyond infectivity for several months.[4–6] For this reason, repeat PCR screening in asymptomatic athletes is not routinely recommended for 90 days postinfection. Repeat testing can stratify whether viral load is decreasing and may inform decisions to isolate a patient beyond 10 days in some cases. In the event an athlete has been retested within 90 days, consider their Ct value. When Ct is >35 and the patient's symptoms have resolved, infectivity is unlikely.[6]

RETURN TO SPORT FOR A COVID-19 CONFIRMED CASE

Following infection, there should be a graduated return to sport, guided by professional advice which may vary based on the severity of the illness, the demands of the sport and logistical factors.[8–10] Additional cardiac testing should be considered based on the severity of illness.[11]

[1]Sports Medicine, SportNI Sports Institute, Newtownabbey, UK
[2]Sports Medicine NI, Belfast, UK
[3]Medical and Anti-Doping Department, Federation Internationale de Football Association, Zurich, Zürich, Switzerland
[4]Sport Medicine Department, World Rugby, Dublin, Ireland
[5]Department of Medicine, University College Cork, Cork, Ireland
[6]ATP Medical Services, Ponte Vedra, Florida, USA
[7]Australian Football League, Docklands, Victoria, Australia
[8]St Andrew's House Edinburgh, Scottish Government Sport and Physical Activity Policy Team, Edinburgh, UK
[9]Sports Medicine, Scottish Institute of Sport, Stirling, UK
[10]Department of Immunology, University of Bern, Bern, Switzerland
[11]Microbiology, University of Groningen, Groningen, The Netherlands
[12]Medical Department, British Cycling, Manchester, UK
[13]Sports Medicine, Sport Wales, Cardiff, UK
[14]Cwm Taf Morgannwg University Health Board, Abercynon, UK
[15]Medicine, USA Cycling, Colorado Springs, Colorado, USA
[16]School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast, Belfast, UK
[17]Trauma and Orthopaedics, Chelsea and Westminster Hospital, London, UK
[18]Public Health/SEM, Barts Health NHS Trust, London, UK
[19]Faculty of Health Sciences, University of Pretoria, Pretoria, South Africa
[20]AMC/VUmc IOC Research Center of Excellence, Amsterdam Collaboration on Health & Safety in Sports (ACHSS), Amsterdam, The Netherlands
[21]Sports Medicine, Sport Scotland Institute of Sport, Stirling, UK
[22]Department of Family Practice, Queen's University Belfast, Belfast, UK

Correspondence to Dr Neil Heron, Department of Family Practice, Queen's University Belfast, Belfast BT7 1NN, UK; neilheron@yahoo.co.uk

Twitter Andrew Massey @andy_massey, Andrew Murray @docandrewmurray, Michael Edmund David McLarnon @mmclarnon98, Dionisio Izquierdo @DrDionisioizq, Babette M Pluim @docpluim, Niall Elliott @dundeesportsmed and Neil Heron @neilSportDoc

Acknowledgements The authors cknowledge the support and guidance provided by the UK Home Institute of Sport Medical and support staff, particularly from the Sport Institute of Northern Ireland.

Collaborators Science and medical support staff at the UK Home Institutes of Sport and particularly at the Sport Institute of Northern Ireland.

Contributors The infographic idea was conceived by AR and NH and then developed by all authors; AR and NH produced the initial infographic, which was then revised by all authors; all authors approved the final version of the infographic.

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; externally 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)) 2021. No commercial re-use. See rights and permissions. Published by BMJ.

Check for updates

To cite Rankin A, Massey A, Falvey ÉC, *et al*. *Br J Sports Med* Epub ahead of print: [*please include* Day Month Year]. doi:10.1136/bjsports-2020-103751

Accepted 5 January 2021

Br J Sports Med 2021;**0**:1–3. doi:10.1136/bjsports-2020-103751

ORCID iDs
Alan Rankin http://orcid.org/0000-0001-5132-1937
Andrew Massey http://orcid.org/0000-0002-8253-932X
Éanna Cian Falvey http://orcid.org/0000-0003-3961-1805
Andrew Murray http://orcid.org/0000-0003-3327-8028
Michael Edmund David McLarnon http://orcid.org/0000-0002-9478-8569
Babette M Pluim http://orcid.org/0000-0003-0655-8980
Niall Elliott http://orcid.org/0000-0002-5394-975X
Neil Heron http://orcid.org/0000-0002-4123-9806

REFERENCES

1 Toresdahl BG, Asif IM. Coronavirus disease 2019 (COVID-19): considerations for the competitive athlete. *Sports Health* 2020;12:221–4.
2 Watson J, Whiting PF, Brush JE. Interpreting a covid-19 test result. *BMJ* 2020;369:m1808.
3 Eikenberry SE, Mancuso M, Iboi E, *et al*. To mask or not to mask: modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic. *Infect Dis Model* 2020;5:293–308.
4 Singanayagam A, Patel M, Charlett A, *et al*. Duration of infectiousness and correlation with RT-PCR cycle threshold values in cases of COVID-19, England, January to may 2020. *Euro Surveill* 2020;25:2001483.
5 Group SRA. Interpretation of PCR results and infectivity, 2020. Available: https://covid-19.sciensano.be/sites/default/files/Covid19/30300630_Advice_

Br J Sports Med: first published as 10.1136/bjsports-2020-103751 on 17 January 2021. Downloaded from http://bjsm.bmj.com/ on February 24, 2021 at University of Groningen. Protected by copyright.

RAG_interpretation%20PCR.pdf [Accessed 30 Jun 2020].
6 Bullard J, Dust K, Funk D, *et al*. Predicting infectious severe acute respiratory syndrome coronavirus 2 from diagnostic samples. *Clinical Infectious Diseases* 2020;71:2663–6.
7 United Kingdom government. Guidance for contacts of people with confirmed coronavirus (COVID-19) infection who do not live with the person. Available: https://www.gov.uk/government/publications/guidance-for-contacts-of-people-with-possible-or-confirmed-coronavirus-covid-19-infection-who-do-not-live-with-the-person/guidance-for-contacts-of-people-with-possible-or-confirmed-coronavirus-covid-19-infection-who-do-not-live-with-the-person [Accessed 30 Oct 2020].
8 Elliott N, Martin R, Heron N, *et al*. Infographic. graduated return to play guidance following COVID-19 infection. *Br J Sports Med* 2020;54:1174–5.
9 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.
10 Löllgen H, Bachl N, Papadopoulou T, *et al*. Recommendations for return to sport during the SARS-CoV-2 pandemic. *BMJ Open Sport Exerc Med* 2020;6:e000858.
11 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;54:1130–1.

Br J Sports Med: first published as 10.1136/bjsports-2020-103751 on 17 January 2021. Downloaded from http://bjsm.bmj.com/ on February 24, 2021 at University of Groningen. Protected by copyright.