

Infographic. Graduated return to play guidance following COVID-19 infection

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COVID-19 AND SPORT

With risk of cardiological, renal, respiratory and haematological complications,¹⁻⁵ it is best practice to follow steady resumption of training, paying attention to physical and psychological factors after COVID-19 infection.

SCOPE OF THIS INFOGRAPHIC

This guidance takes into account public health guidelines in the UK (although we hope its content is relevant more widely)

and available expert opinion at time of publication and is for use by healthcare practitioners. It is applicable to performance athletes who have had mild to moderate illness. Those requiring hospital admission merit further assessment.

COVID-19 CLINICAL GUIDANCE

If an athlete develops an illness with symptoms of COVID-19, they should follow national guidance, speak to their sports medicine doctor, and undertake

appropriate quarantine, testing and tracing.

They should maintain good hydration, a balanced diet and, if symptoms worsen or persist beyond 7 days, seek further medical review.

Quarantine when living with others includes practical aspects such as isolating within rooms not accessed by other persons, maintaining supplies of food and water, use of a different toilet and washing dirty linen and clothes regularly.

GRADUATED RETURN TO PLAY (GRTP) PROTOCOL

A GRTP is a progressive programme that introduces physical activity and sport in a stepwise fashion.

Key considerations

- ▶ Before considering GRTP, the athlete must be able to complete activities of daily living and walk 500m on the flat without excessive fatigue or breathlessness.
- ▶ They should have at least 10 days' rest and be 7 days symptom-free before starting.
- ▶ Less aerobically intense sports like golf may progress quicker. Experience suggests that some athletes take over 3 weeks to recover.

Some monitoring may add value, which could include

- ▶ Resting heart rate.
- ▶ Rated perceived exertion.
- ▶ Sleep, stress, fatigue and muscle soreness.
- ▶ Injury-Psychological Readiness to Return to Sport.

If any symptoms occur (including excessive fatigue) while going through GRTP, the athlete must return to the previous stage and progress again after a minimum of 24 hours' period of rest without symptoms.

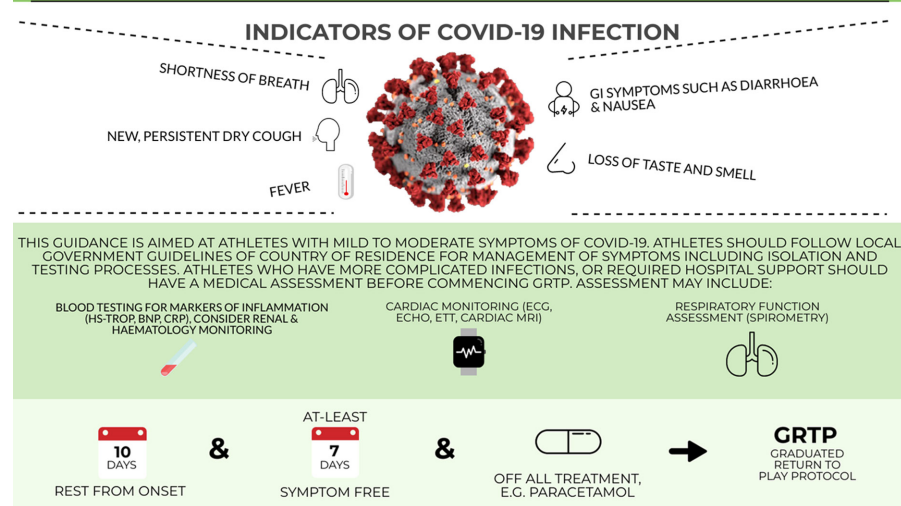
ATHLETES WITH COMORBIDITIES

Athletes diagnosed with COVID-19 and who have medical conditions such as diabetes, cardiovascular disease or renal disease should have a medical assessment before commencing GRTP.

FURTHER ASSESSMENTS

Athletes who have a complicated or prolonged COVID-19 illness may need further investigations, including

COVID-19 GRADUATED RETURN TO PLAY FOR PERFORMANCE ATHLETES: GUIDANCE FOR MEDICAL PROFESSIONALS



	GRADUATED RETURN TO PLAY PROTOCOL UNDER MEDICAL SUPERVISION					
	STAGE 1 10 DAYS MINIMUM	STAGE 2 2 DAYS MINIMUM	STAGE 3A 1 DAY MINIMUM	STAGE 3B 1 DAY MINIMUM	STAGE 4 2 DAYS MINIMUM	STAGE 5 EARLIEST DAY 17
ACTIVITY DESCRIPTION	MINIMUM REST PERIOD	LIGHT ACTIVITY	FREQUENCY OF TRAINING INCREASES	DURATION OF TRAINING INCREASES	INTENSITY OF TRAINING INCREASES	RESUME NORMAL TRAINING PROGRESSIONS
EXERCISE ALLOWED	WALKING, LIGHT JOGGING, STATIONARY CYCLE, NO RESISTANCE TRAINING	WALKING, LIGHT JOGGING, STATIONARY CYCLE, NO RESISTANCE TRAINING	SIMPLE MOVEMENT ACTIVITIES E.G. RUNNING DRILLS	PROGRESSION TO MORE COMPLEX TRAINING ACTIVITIES	NORMAL TRAINING ACTIVITIES	RESUME NORMAL TRAINING PROGRESSIONS
% HEART RATE MAX		<70%	<80%	<80%	<80%	RESUME NORMAL TRAINING PROGRESSIONS
DURATION	10 DAYS	<15 MINS	<30 MINS	<45 MINS	<60 MINS	RESUME NORMAL TRAINING PROGRESSIONS
OBJECTIVE	ALLOW RECOVERY TIME, PROTECT CARDIO-RESPIRATORY SYSTEM	INCREASE HEART RATE	INCREASE LOAD GRADUALLY, MANAGE ANY POST VIRAL FATIGUE SYMPTOMS	EXERCISE, COORDINATION AND SKILLS/TACTICS	RESTORE CONFIDENCE AND ASSESS FUNCTIONAL SKILLS	RESUME NORMAL TRAINING PROGRESSIONS
MONITORING	SUBJECTIVE SYMPTOMS, RESTING HR, I-PPRS	SUBJECTIVE SYMPTOMS, RESTING HR, I-PPRS, RPE	SUBJECTIVE SYMPTOMS, RESTING HR, I-PPRS, RPE	SUBJECTIVE SYMPTOMS, RESTING HR, I-PPRS, RPE	SUBJECTIVE SYMPTOMS, RESTING HR, I-PPRS, RPE	SUBJECTIVE SYMPTOMS, RESTING HR, I-PPRS, RPE

ACRONYMS: I-PPRS (INJURY - PSYCHOLOGICAL READINESS TO RETURN TO SPORT); RPE (RATED PERCEIVED EXERTION SCALE)
NOTE: THIS GUIDANCE IS SPECIFIC TO SPORTS WITH AN AEROBIC COMPONENT

RETURN TO COMPETITION
IN SPORT SPECIFIC TIMELINES

- Blood testing for markers of inflammation (high sensitivity-Troponin, Brain Natriuretic Peptide and C reactive protein).^{3,4}
- Cardiac monitoring (12-lead ECG, echocardiogram, exercise tolerance test and cardiac MRI).^{3,4}
- Respiratory function assessment (spirometry).
- Renal and haematological monitoring.

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REFERENCES

- 1 Condliffe R *et al.* British thoracic Society guidance on venous thromboembolic disease in patients with COVID-19 British thoracic Society pulmonary vascular specialist Advisory group 2020.
- 2 Perico L, Benigni A, Remuzzi G. Should COVID-19 concern nephrologists? why and to what extent? the emerging impasse of angiotensin blockade. *Nephron* 2020;144:213–21.
- 3 Bhatia RT, Marwaha S, Malhotra A, *et al.* Exercise in the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) era: A Question and Answer session with the experts Endorsed by the section of Sports Cardiology & Exercise of the European Association of Preventive Cardiology (EAPC). *Eur J Prev Cardiol*. In Press 2020:204748732093059.
- 4 Baggish A, Drezner J. The resurgence of sport in the wake of COVID-19: cardiac considerations in competitive athletes. *BJSM*. Available: <https://blogs.bmj.com/bjism/2020/04/24/the-resurgence-of-sport-in-the-wake-of-covid-19-cardiac-considerations-in-competitive-athletes/>
- 5 Hull J, Loosemore M, Schwellnus M. Respiratory health in athletes; facing the COVID-19 challenge. *The Lancet*.