**Title:** The need for integrated sports and respiratory medicine practice in the aftermath of the COVID-19 pandemic.

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**EDITORIAL**

COVID-19 has revealed inequalities in health, wellbeing and economic status across communities and posing vulnerabilities in societal groups. Whilst the pressure of the first peak abates, there is an urgent need to consider the long-term care needs of those affected by COVID-19 infection to ensure that it does not widen inequality. At the time of writing, the long-term impacts on recovering patients remains unknown. Research on Severe Acute Respiratory Syndrome (SARS) and Middle Eastern Respiratory Syndrome (MERS) infection are associated with persisting abnormal radiographic change, 1 significant impairment of exercise and functional capacity and reduced quality of life following Acute Respiratory Distress Syndrome (ARDS). 2 It is suggested that >50% of patients hospitalised by COVID-19, will suffer profound musculoskeletal and neurological de-conditioning and require substantial care and support. 3 There is a greater challenge to support those with milder symptoms recovering from COVID-19 that are being discharged into community settings with substantial co-morbidities requiring both intermediate (3-6 months) and chronic (>12 months) support, placing unprecedented demand on health care services. 4

The COVID-19 pandemic presents 2 key challenges i) the need to increase the evidence-base to guide the rehabilitation for these patients is limited and ii) it is unclear how this overwhelming demand will be met? In both instances there is a need to adopt a truly multidisciplinary and collaborative approach that brings together respiratory medicine and clinical services alongside sports medicine, exercise scientists, engineering, software and digital technologists to extend the knowledge base in line with recommendations to develop an increased evidence base 5 and support delivery, improving patient outcomes.

Combined insight from clinical respiratory domains can be combined with the specialist knowledge of sports medicine and the exercise sciences can offer a unified approach to understand the complex and chronic nature of COVID-19 recovery. Interrogative procedures such as cardiopulmonary exercise testing and body composition scanning can evaluate individuals recovering from severe COVID-19 infection. These techniques provide a characterisation of cardio-respiratory fitness and the effects of de-conditioning underpinning functional impairment and support the development of efficacious rehabilitation strategies.

Rehabilitation resource within the NHS is scarce, and planning for the inevitable change in demand for recovering COVID-19 patients is difficult given the lack of understanding of the recovery trajectory in this novel disease. One way to partially address the issue with capacity is to bring collective expertise of sports medicine and exercise sciences, to design and deliver interventions and address patients physical and mental health needs. The physical health of patients is the primary focus of rehabilitation programmes and yet previous epidemics (e.g. SARS) demonstrate reduced mental health and wellbeing in patients and health care workers. 6 As a result of ‘lockdown’ and social distancing, it is reasonable to assume that the negative impact on the mental health of COVID-19 will be greater than that caused by SARS. Evidence demonstrates that regular structured exercise and psychological interventions from exercise science are effective in improving people’s mental health and can address broader health and wellbeing issues similar to those elicited by COVID-19. 7 Interventions must extend beyond clinical settings to support individuals and communities, where depressive and anxiety symptoms have been reported. 8 Sports medicine practitioners have a clear role to play here, but health and social care policymakers, commissioners and managers first need to understand what the offer is from the sector. This has not been well articulated to date.

The contribution that sports medicine includes utilising specific knowledge from personnel in academic and applied settings. Importantly here is the availability of physical resources such as opening exercise physiology laboratories can be repurposed to provide testing facilities for patients recovering from COVID-19 in the community. In addition, sports centres across the UK (and especially those in Universities that provide degrees in exercise science and sports medicine) could be repurposed to act as COVID-19 rehabilitation centres.

The first COVID-19 peak in the UK presented a challenge to clinical services and resource capacity. The risk of a second peak in addition to supporting those with existing COVID-19 induced impairment from the first peak could overwhelm clinical services, particularly if it coincided with an outbreak of seasonal influenza. It is also reasonable to assume that COVID-19 will not be the last pandemic. Therefore, there is a need to support the current caseload of patients and prepare for the future by making sure we marshal our resources and develop strong collaborative approaches that combine clinical and sports medicine disciplines to tackle current and future healthcare emergencies.

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