Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

NICE guideline on long COVID

As the global COVID-19 pandemic has progressed, evidence has emerged that some patients are experiencing prolonged multiorgan symptoms and complications beyond the initial period of acute infection and illness. The list of persisting and new symptoms reported by patients is extensive, including chronic cough, shortness of breath, chest tightness, cognitive dysfunction, and extreme fatigue. Termed long COVID or post-COVID-19 syndrome, the implications and consequences of such ongoing clinical manifestations are a growing health concern.

In the UK, as of Jan 10, 2021, there have been around 3·02 million confirmed cases of COVID-19. As the scope of testing widens, the number of patients reporting long COVID symptoms is also increasing. In a survey by the UK Government's Office for National Statistics in November, 2020, around one in five people who tested positive for COVID-19 had symptoms that lasted for 5 weeks or longer, and one in ten people had symptoms that lasted for 12 weeks or longer. These figures equate to an estimated 186 000 individuals (95% CI 153 000–221 000) in England who had symptoms persisting between 5 and 12 weeks.

Clearly, a large number of resources will be needed to help patients and clinicians understand and manage long-term COVID-19 sequelae. In the UK, 68 clinics have been set up so far by the National Health Service to assess long-term post-COVID-19 effects. Additionally, in December, 2020, the National Institute for Health and Care Excellence (NICE) in partnership with the Scottish Intercollegiate Guidelines Network and the Royal College of General Practitioners published a guideline for clinicians on the management and care of people with long-term effects of COVID-19.

In the guideline, two definitions of postacute COVID-19 are given: (1) ongoing symptomatic COVID-19 for people who still have symptoms between 4 and 12 weeks after the start of acute symptoms; and (2) post-COVID-19 syndrome for people who still have symptoms for more than 12 weeks after the start of acute symptoms. The guideline also makes recommendations for clinical investigations of patients presenting with new or ongoing symptoms 4 weeks or later after acute infection. The recommended investigations include a full blood count, kidney and liver function tests, a C-reactive protein test, and an exercise tolerance test (recording level of breathlessness, heart rate, and O_2 saturation). They also recommend that a chest x-ray should be offered to all patients by 12 weeks after acute infection if they have continuing respiratory symptoms.

As COVID-19 (and post-COVID-19 syndrome) are still such new conditions, the guideline is adaptive and will be updated as new evidence becomes available from scientific and clinical studies. Recommended key areas of research into post-COVID-19 syndrome include risk factors for developing the syndrome (including its prevalence in different populations), clinically effective interventions, screening, and the natural history of the disease; large ongoing studies in this field include PHOSP-COVID, an 18-month study that is assessing the long-term health outcomes for 10 000 people who have been admitted to hospital with COVID-19.

The NICE guideline has been welcomed by health-care professionals, but certain gaps are evident and it will be crucial to fill them as soon as possible. For example, although the guidance acknowledges the importance of multidisciplinary rehabilitation for the management of patients post COVID, Sally Singh (University of Leicester, Leicester, UK) points out that "rehabilitation programmes should be individualised and adapted to accommodate the needs of the patient". The British Lung Foundation also call for more detail in the guideline about rehabilitation resources since these will play a crucial role in recovery, commenting "we particularly need details on who would benefit from rehabilitation, and what kind they should have. We [also] need to ensure there is capacity in community rehabilitation services to help people with long COVID, since existing services might struggle to meet extra demand". They continued, "it's important the guideline continues to evolve so we can ensure the best possible care for anyone struggling."

Chris Brightling (National Institute of Health Research, Leicester, UK) highlighted that the guideline will need to include a comprehensive review of the symptoms and pathology of long COVID as more evidence becomes available. Preliminary pulmonary findings include extensive lung thrombosis and persistence of viral RNA and syncytia in pneumocytes in an analysis of 41 post-mortem samples, and weakened lung function and lung damage in a scanning study of 40 patients who have persisting shortness of breath. But, as Brightling emphasises, our gaps in knowledge remain considerable. He comments, "we need to understand why following COVID-19 infection, the impact varies from full recovery to severe, persistent debilitating symptoms affecting multiple organs and mental health". Updating guidance with understanding of the biological basis of post-acute COVID-19 clinical symptoms, and details on recovery and rehabilitation services will be essential to providing personalised, evidence-based care for these patients.

Priya Venkatesan

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For more on the **symptoms of long COVID** see https://www.nhs.uk/conditions/coronavirus-covid-19/long-term-effects-of-coronavirus-long-covid/ and *medRxiv* 2020; published online Dec 27. https://doi.org/10.1101/2020.12.24.20248802 (preprint)

For more on the **current number of confirmed cases of COVID-19 in the UK** see https://covid19.who.int/region/euro/country/gb

For **estimates of long COVID prevalence in England and the UK** see https://www.ons.gov.uk/news/statementsandletters/theprevalenceoflongcovidsymptomsandcovid19complications

For a **list of long COVID assessment clinics in England (UK)** see https://www.england.nhs.uk/coronavirus/post-covid-syndrome-long-covid/

For the **NICE guideline on management of long COVID** see https://www.nice.org.uk/guidance/NG188

For the **post-hospitalisation COVID-19 (PHOSP-COVID) study** see https://www.phosp.org/

For the **analysis of post-mortem COVID-19 samples** see *EBioMedicine* 2020; **61:** 103104

For the **scanning study of lung damage from patients with long COVID** see https://oxfordbrc.nihr.ac.uk/hidden-lung-damage-from-covid-19-revealed-in-new-study/

For more on **holistic care after severe COVID-19 pneumonia** see **Spotlight** *Lancet Respir Med* 2020; **8:** 1175–76