

# Editorials

## Long COVID: A Primer for Family Physicians

Trisha Greenhalgh, BM BChir, MD, PhD, MBA  
University of Oxford, Oxford, United Kingdom

Matthew Knight, MBBS, BSc, PGCert (Allergy)  
FRCP, West Hertfordshire Hospitals National  
Health Services Trust, Watford, United Kingdom

See related article about the outpatient management of acute COVID-19 at <https://www.aafp.org/afp/2020/1015/p478.html>.

Published online November 18, 2020.

As the United States struggles with a prolonged wave of acute coronavirus disease 2019 (COVID-19; see article recently published in *American Family Physician*<sup>1</sup>), family physicians need to be prepared to care for patients presenting with postacute (one to three months) or chronic (beyond three months) manifestations of this complex disease.

Among nonhospitalized patients with COVID-19, two-thirds are symptom-free by 14 days after symptom onset, and 90% are symptom-free by 21 days.<sup>2,3</sup> The rest of patients experience persistent—or relapsing and remitting—symptoms, including cough, breathlessness, fatigue, fever, sore throat, nonspecific chest pains (lung burn), cognitive blunting (brain fog), anxiety, depression, skin rashes, and diarrhea.<sup>4,5</sup>

The term long COVID was coined by online communities of patients who felt dismissed by their physicians as overreacting to “mild” illness.<sup>5</sup> However, evidence is accumulating that long COVID is a distinct syndrome, perhaps due to a dysfunctional immune-inflammatory response, that can affect people who were never hospitalized and may occur without a history of a polymerase chain reaction test positive for COVID-19.<sup>4,6</sup> There are no official guidelines for the management of long COVID, but a recent review has highlighted some important principles,<sup>4</sup> which we will briefly summarize.

The key task of the family physician is to distinguish patients with life-threatening or serious post-COVID complications from those with less concerning symptoms. Serious complications include pulmonary embolus, heart failure, stroke, myocardial infarction, lung fibrosis, neurologic derangement, and severe deterioration in mental health. Patients presenting with nonserious symptoms benefit from support and reassurance

through a natural process of convalescence.<sup>7-9</sup> Evaluation for alternative diagnoses (e.g., deteriorating comorbidities, infection, endocrine disturbance) is vital because not all illness in a patient recovering from COVID-19 is caused by postacute COVID-19.

Detailing the history of the acute disease, including biometric readings (e.g., oxygen saturations), and the subsequent clinical course is essential. Current symptoms should be noted and prioritized. Red flag symptoms, such as chest pain, should be carefully explored. Medications, including over-the-counter and alternative therapies, should be checked. A social history may reveal relevant issues, such as isolation, economic hardship, pressure to return to work, bereavement, or loss of personal routines (e.g., shopping, church), which can impact patients’ well-being.

Although remote assessment may be appropriate, in some cases, a physiologic evaluation of patients with prolonged symptoms should be combined with a review of functional status and mental well-being. Patients with oxygen saturation persistently below 95% require additional evaluation. In patients whose oxygen saturation is 96% or above at rest, tests for exertional desaturation (e.g., 40 steps around the room and, if negative, followed by a one-minute sit-stand assessment supervised by a health care professional) may be informative.<sup>10</sup> If the exertional test results in a drop of 3% or more in oxygen saturation, further assessment is warranted. Home self-monitoring of oxygen saturation using a patient diary may provide further reassurance.

Blood tests and imaging should be guided by the clinical assessment. When indicated, tests may include complete blood count; liver and kidney function; urinalysis; D-dimer assay; and measurements of electrolytes, C-reactive protein, troponin, ferritin (useful in evaluating inflammatory and prothrombotic states), and brain natriuretic peptides.<sup>4</sup> In those with cardiac symptoms, a 12-lead electrocardiograph can be reassuring if findings are normal, but abnormal findings, combined with concerning clinical and blood test findings, should prompt further cardiac investigation.<sup>11</sup>

Patients with acute COVID-19 and abnormal findings on chest imaging or significant respiratory illness should have repeat chest radiography at 12 weeks or earlier. Repeat chest imaging may not be needed otherwise if cough and breathlessness

are mild and improving.<sup>12</sup> Those with persistent cough and breathlessness may benefit from simple breathing exercises (slow, diaphragmatic breathing with a 1:2 inspiration to expiration ratio several times per day). Formal rehabilitation is often helpful if the initial respiratory illness was severe, but not for milder illness.<sup>13</sup>

Recommended management for most patients in the outpatient setting, whose symptoms tend to be nonspecific and dominated by fatigue, consists of emotional support, ongoing monitoring, symptomatic treatment (e.g., acetaminophen for fever), and attention to comorbidities. Because the role of exercise in recovery is controversial,<sup>10</sup> patients should be counseled to pace themselves carefully and cut back if symptoms worsen. Specific guidance has been published for athletes returning to sports participation.<sup>10,13-15</sup>

Mental health and well-being may be greatly improved by reestablishing social connections, community and peer support, and attention to structural determinants (e.g., measures to mitigate poverty, fight discrimination, and achieve social justice).<sup>16,17</sup> Psychiatric referral may be appropriate for some patients.

The United States is likely heading toward 20 million total cases of COVID-19. Core functions of family medicine, such as first contact care; holistic, person-focused care over time; comprehensive care; and coordinated care, likely will prove to be the cornerstone of managing the million or more Americans who develop long COVID.<sup>18</sup>

**Address correspondence** to Trisha Greenhalgh, BM BChir, MD, PhD, MBA, at [trish.greenhalgh@phc.ox.ac.uk](mailto:trish.greenhalgh@phc.ox.ac.uk). Reprints are not available from the authors.

**Author disclosure:** No relevant financial affiliations.

## References

- Cheng A, Caruso D, McDougall C. Outpatient management of COVID-19: rapid evidence review. *Am Fam Physician*. 2020;102(8):478-486. Accessed November 2, 2020. <https://www.aafp.org/afp/2020/1015/p478.html>
- COVID symptom study. How long does COVID last? June 6, 2020. Accessed June 21, 2020. <https://covid19.joinzoe.com/post/covid-long-term>
- Tenforde MW, Kim SS, Lindsell CJ, et al.; IVY Network Investigators; CDC COVID-19 Response Team. Symptom duration and risk factors for delayed return to usual health among outpatients with COVID-19 in a multistate health care systems network – United States, March–June 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(30):993-998.
- Greenhalgh T, Knight M, A’Court C, et al. Management of post-acute COVID-19 in primary care. *BMJ*. 2020;370:m3026.
- Assaf G, Davis H, McCorkell L, et al. Report: what does COVID-19 recovery actually look like? An analysis of the prolonged COVID-19 symptoms survey by patient-led research team. Accessed November 5, 2020. <https://patientresearchcovid19.com/>
- Tay MZ, Poh CM, Rénia L, et al. The trinity of COVID-19: immunity, inflammation and intervention. *Nat Rev Immunol*. 2020;20(6):363-374.
- Klok FA, Kruip MJHA, van der Meer NJM, et al. Incidence of thrombotic complications in critically ill ICU patients with COVID-19. *Thromb Res*. 2020;191:145-147.
- Madjid M, Safavi-Naeini P, Solomon SD, et al. Potential effects of coronaviruses on the cardiovascular system: a review. *JAMA Cardiol*. 2020;5(7):831-840.
- Fraser E. Long term respiratory complications of COVID-19. *BMJ*. 2020;370:m3001.
- National Institute for Health and Care Excellence. Statement about graded exercise therapy in the context of COVID-19. July 2020. Accessed July 10, 2020. <https://www.nice.org.uk/guidance/gid-ng10091/documents/statement>
- European Society of Cardiology. ESC guidance for the diagnosis and management of CV disease during the COVID-19 pandemic. Updated June 10, 2020. Accessed July 23, 2020. <https://www.escardio.org/Education/COVID-19-and-Cardiology/ESC-COVID-19-Guidance>
- George PM, Barratt S, Desai SR, et al. British Thoracic Society guidance on respiratory follow up of patients with a clinicoradiological diagnosis of COVID-19 pneumonia. Updated May 2020. Accessed June 22, 2020. <https://www.brit-thoracic.org.uk/document-library/quality-improvement/covid-19/resp-follow-up-guidance-post-covid-pneumonia/>
- Barker-Davies RM, O’Sullivan O, Senaratne KPP, et al. The Stanford Hall consensus statement for post-COVID-19 rehabilitation. *Br J Sports Med*. 2020;54(16):949-959.
- Elliott N, Martin R, Heron N, et al. Infographic. Graduated return to play guidance following COVID-19 infection. *Br J Sports Med*. 2020;54(19):1174-1175.
- Diamond AB, Narducci DM, Roberts WO, et al. Interim guidance on the preparticipation physical examination for athletes during the SARS-CoV-2 pandemic [published online October 7, 2020]. *Clin J Sport Med*. Accessed November 2, 2020. [https://journals.lww.com/cjsportsmed/Abstract/9000/Interim\\_Guidance\\_on\\_the\\_Preparticipation\\_Physical.98923.aspx](https://journals.lww.com/cjsportsmed/Abstract/9000/Interim_Guidance_on_the_Preparticipation_Physical.98923.aspx)
- Rose N, Manning N, Bentall R, et al. The social underpinnings of mental distress in the time of COVID-19 – time for urgent action. *Wellcome Open Res*. 2020;5:166.
- Egede LE, Walker RJ. Structural racism, social risk factors, and COVID-19 – a dangerous convergence for Black Americans [published online July 22, 2020]. *N Engl J Med*. Accessed November 5, 2020. <https://www.nejm.org/doi/full/10.1056/NEJMp2023616>
- Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q*. 2005;83(3):457-502. ■