



# 11 LONG COVID

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# MODULE 11: LONG-COVID/POST-ACUTE SEQUELAE OF COVID (PASC)

## WHAT'S NEW?

Update May 2021

- Inclusion of the term 'post-acute sequelae of COVID' (PASC).
- Expanded focus on rehabilitation strategies and techniques.

## KEY RECOMMENDATIONS

Long-COVID is generally defined as COVID-19-related symptoms that are present 28 days or more after the onset of acute COVID-19 infection.

Common symptoms in long-COVID include fatigue, persistent anosmia, dyspnoea, myalgia, persistent cough and headaches, although a diverse array of symptoms have been reported.

There is no role for routine testing in patients suspected of having long-COVID. A documented history of acute COVID-19, or a positive antibody test, support the diagnosis of long-COVID, although owing to suboptimal test sensitivity and coverage, these are not required to make the diagnosis.

An individualised approach to management is recommended, based on patient symptoms and goals, and taking into account patient comorbidities. Where feasible, a multidisciplinary team approach is likely to be most useful, with the inclusion of doctors, physiotherapists, occupational therapists, and psychologists, among others.

## BACKGROUND

In the aftermath of the first wave of COVID-19, reports began accumulating of patients having persistent or new symptoms following acute COVID-19 infection. This phenomenon is now most commonly referred to as 'long-COVID' or 'post-acute sequelae of COVID' (PASC). Although there is no international consensus definition, it is usually defined as symptoms due to COVID-19 being present 28 days after the onset of the acute infection.<sup>1</sup>

## EPIDEMIOLOGY AND PATHOGENESIS

A study in Britain reported that COVID-19 symptoms were present in 13% of patients at one month, 5% at two months, and 2% at three months.<sup>2</sup> Risk factors for prolonged symptoms in that study included having more than five symptoms initially, older age and female sex. The severity of the initial disease is also predictive of long-COVID, with hospitalised patients and those with abnormal chest auscultation at presentation being more likely to have persistent symptoms at days 30 and 60.<sup>3</sup> In this cohort of patients who sought medical attention (a group somewhat more severely affected than the general population), approximately two-thirds of patients had symptoms at both one and two months.

The pathogenesis of long-COVID is likely to be multifactorial, with different causes in different patients. Postulated mechanisms include a post-infectious inflammatory syndrome, persistent sequestered viral replication, skeletal muscle deconditioning and other features of post-ICU syndrome (PICS), residual end-organ damage, and symptoms due to anxiety, depression or post-traumatic stress disorder (PTSD).<sup>4-6</sup>

## CLINICAL FEATURES

The most common clinical features reported in long-COVID, each present in half or more of patients, are fatigue, anosmia, dyspnoea, myalgias, persistent cough, myalgias, fever and headaches.<sup>2, 3</sup> However, a diverse array of symptoms have been reported, including diarrhoea, tinnitus, palpitations, memory and sleep disturbances, and peripheral neuropathy. Some symptoms may only start for the first time 3-4 weeks after the acute COVID-19 infection.<sup>2</sup> It is also important to consider psychological symptoms and syndromes that may follow COVID-19 infection, including depression, anxiety and post-traumatic stress disorder.<sup>7-9</sup> Despite their ongoing symptoms, patients with long-COVID do not need isolation, as they are not infectious.



## EXCLUSION OF OTHER CAUSES

- A thorough history and examination is recommended to exclude other causes or to make a differential diagnosis linked to long-COVID. Particular attention should be paid to excluding alternative causes in patients with unusual symptoms such as weight loss, and those with a history of cancer or other significant comorbidities, etc.
- Known sequelae of COVID-19 that warrant consideration include myocarditis, pulmonary embolism and stroke. However, these are not likely to be present in most cases of long-COVID.
- There is no role for routine investigations in long-COVID, other than those guided by the history and examination.

- A history of a positive test for acute COVID-19 (by PCR or antigen test), or a positive antibody test at the time of either acute infection or suspected long-COVID, would support the diagnosis of long-COVID. However, as these tests have suboptimal sensitivity, a positive result is not an absolute requirement to make the diagnosis. Conversely, a history of a positive COVID-19 test in a patient with new or ongoing symptoms does not necessarily indicate that long-COVID is the cause.

## MANAGEMENT – GENERAL PRINCIPLES

- Patients should be reassured that the majority of symptoms resolve with time. However, patients with troublesome symptoms or with symptoms that fail to resolve in 6-8 weeks should be advised to seek medical attention.
- Focus is on slow and stepwise rehabilitation and symptom alleviation. There is no specific pharmacological therapy for long-COVID.
- Providing resources for long-COVID support and management as reassurance, advice and education are considered to be powerful tools in the management of long COVID-19.<sup>6</sup>
- Most guidance at this stage is based on common-sense extrapolations from what is known about rehabilitation and symptom alleviation in other similar contexts. Robust evidence from patients with long-COVID specifically is eagerly awaited.
- An individualised approach is recommended, based on patient symptoms and goals, and taking into account patient comorbidities.
- The optimal rehabilitation strategy is likely to cut across several disciplines. A multidisciplinary team approach is likely to be most useful, potentially with the inclusion of doctors, physiotherapists, occupational therapists, psychologists, speech therapists and audiologists, among others.<sup>10</sup>
- Comprehensive assessment for rehabilitation needs including physical and mental aspects is essential.<sup>10</sup>
- Close attention should be paid to optimising the management of any comorbidities, to ensure that these conditions are not contributing to the ongoing symptoms.
- Tele-rehabilitation as a means of patient follow-up should be considered.<sup>11</sup>

## SPECIFIC STRATEGIES THAT MAY BE USEFUL

- Fatigue and low energy levels may be helped by therapeutic graded exercise programmes, tailored towards the individual. Key features are careful pacing, prioritisation and modest goal setting. Patients should engage in low-intensity exercise initially, increasing gradually only if tolerated.<sup>5, 6</sup>
- Fatigue following COVID-19 can have several distinct mechanisms (e.g. cardiopulmonary, central nervous system or neuromuscular causes); these should be differentiated prior to

starting rehabilitation as their management will differ. In particular, post-viral fatigue syndrome should be excluded as a cause of fatigue since standard rehabilitation may be detrimental. Fatigue management may incorporate energy-conservation principles (organisation, balance rest/activity and work simplification), breathing techniques (for anxiety and respiratory conditions) as well as relaxation techniques.<sup>12</sup> Fatigue can be influenced by pain, diet, sleep patterns, diet, physical activities, cognitive activities, etc. and fatigue management should address all contributing factors.

- Where available, respiratory or cardiac rehabilitation programmes may be useful particularly for those patients who had severe COVID-19, and/or who had significant underlying cardiopulmonary comorbidities.<sup>6</sup>
- Breathlessness and cough may respond to breathing-control exercises.<sup>5</sup>
- Patients with long-COVID should be assessed for symptoms compatible with depression, anxiety or post-traumatic stress disorder, general wellbeing, confidence and acceptance. Stress-reduction techniques, peer support (e.g. COVID-survivor support groups), and referral to a psychologist, psychiatrist and or occupational therapist may be required. COVID-19 may precipitate or unmask underlying psychiatric diseases.<sup>9</sup>
- Patients with anosmia may benefit from olfactory training.<sup>13</sup>
- Athletes or patients in physically demanding jobs who have confirmed COVID-19 myocarditis should ideally only resume high-intensity physical activity after a period of rest, and after their heart has been assessed as normal by echocardiography and ECG. Consultation with a cardiologist is advised prior to seeking rehabilitation services, and prior to returning to strenuous physical activity.<sup>6</sup>
- Dizziness, tinnitus and earache may be part of long-COVID symptomatology. Techniques that may be helpful can include tinnitus retraining therapy, audiologic monitoring using extended high frequency audiometry, and assistance with hearing aid fitting. For patients experiencing balance



#### Orthotics and Prosthetics referral guidelines for patients who might require these services:

- Patients diagnosed with Long COVID-19 and or severe COVID who develop flexion contractures due to muscular atrophy and or muscle weakness during long periods of bed rest (e.g. in ICU), should be referred to an Medical Orthotist and Prosthetist (MOP) for evaluation and fitting of a relevant assistive device i.e. AFO Night Splint.
- A patient utilising either a prosthesis or orthosis who struggles to mobilise due to Long COVID-19 symptoms will benefit from additional assistive devices as prescribed by an MOP, as part of their rehabilitation plan.
- Patients might need to be re-screened and evaluated for a prosthesis or orthosis depending on how badly they are affected by Long COVID-19.

problems, vestibular assessment and rehabilitation, and group exercises with a physiotherapist, can be helpful.<sup>14</sup>

- Occupational therapy (OT) referral may be beneficial in long-COVID. Functional rehabilitation may focus on personal care, other activities of daily living, mobility, functional assistive and mobility devices (issue, education and training).
- Cognitive and psychological deficits can be devastating as they become a barrier to resuming pre-morbid daily tasks in the sphere of home, work and leisure. It is crucial that these are identified as early as possible and referred to OT accordingly. Deficits may be seen in attention, memory and learning, executive function, orientation and visual perception.<sup>12</sup>
- Vocational rehabilitation is essential to ensure that working patients remain in employment or are supported by a graded return to work. OT intervention may include disability grant screening (new/review), functional-capacity evaluation (return to work fitness assessment) and work hardening (which may include physical and cognitive rehabilitation)

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