

COVID-19 “Long Haulers”

What can physiotherapist do to help?

Post-Acute COVID-19 is an **emerging phenomenon** among individuals with previous COVID-19 infection. Also known as “**COVID-19 long-haulers**”, only a few published studies have examined the long-term effects (up to 6 months) following COVID-19 infection.¹⁻⁵

What is Post-Acute COVID-19?

It is the presence of symptoms extending beyond 3 weeks from the initial onset of symptoms and chronic COVID-19 as extending beyond 12 weeks.⁶

How many people are affected?

Most recent data highlights that that **76% of patients** (n=1265/1655) with previous COVID-19 infection reported at least **one symptom at 6 months** after symptom onset and that this proportion was higher in **women**.⁷ Even people who are not hospitalized and who have a mild illness can experience persistent or late symptoms.

Signs and Symptoms

The most common signs and symptoms between up to 6 months after COVID-19 infection⁷ include:

- | | |
|--------------------|----------------------|
| 1. Fatigue | 2. Anxiety |
| 3. Muscle weakness | 4. Depression |
| 5. Joint pain | 6. Sleep disruptions |
| 7. Dyspnea | 8. Brain fog |

Other **long-term complications** including **cardiac, pulmonary, and neurological** sequelae are also possible, especially among individuals who were **most critically ill**.⁷ This is likely as a result of inflammation and “cytokine storm”.⁸

Cardiac complications^{8,9}

1. Myocardial inflammation
2. Cardiac arrhythmias
3. Myocarditis

Pulmonary complications^{2,7}

1. Pulmonary dysfunction as measured by imaging and/or pulmonary function test.
2. Decreased carbon monoxide diffusion capacity
3. Pulmonary fibrosis
4. Interstitial thickening
5. The diminished function of respiratory muscles.

Neurological complications¹⁰

1. Headache
2. Vertigo
3. Sensory dysfunction

How can physiotherapy help?

Physiotherapy and rehabilitation medicine should be at the forefront of managing care of this affected population.¹¹ **Physiotherapists are trained healthcare professionals** that have the knowledge and skills to **develop** individualized treatment plans according to the patient’s needs, taking into consideration their **long-term symptoms** and **comorbidities**. Physiotherapists can 1) **teach** breathing exercises that help increase respiratory volume; 2) **mobilize** stiff thoracic and rib joints after periods of inactivity; 3) **introduce** and **progress** thoracic stretching exercises; 4) **strengthen** postural musculature; and 5) **develop** patient-centered goals to help patients return to their pre-illness activities of daily living, occupation and sporting activities.

Post-COVID Rehabilitation Recommendations¹¹

General recommendations

1. Clinicians should follow preventive measures, wear appropriate personal protective equipment, and *avoid or reduce*, the risk of aerosol generation during interventions and activities.
2. **Pulmonary, cardiac, and neurological** symptoms should be assessed in all patients post-COVID-19, regardless of severity. As such, all patients with prior COVID-19 infection should undergo a comprehensive assessment for their symptoms, function, recovery and potential impairments for a treatment plan.
3. Exercise prescription should be based on their symptoms. **Low-intensity exercise** (≤ 3 METs or $\leq 11/20$ on Ratings of Perceived Exertion (RPE) Scale) should be gradual and while monitoring **symptoms and vital signs**, including heart rate, pulse oximetry, blood pressure and dyspnea before and after each session.¹²
4. Physiotherapists should assess a patients functional status using the Post-COVID-19 functional Status Scale.¹³



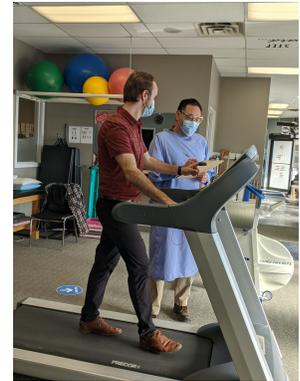
Pulmonary recommendations

1. **Breathing exercises** (e.g., pursed lip, diaphragmatic, thoracic expansion), **airway clearance and forced expiration techniques** (e.g., huffing, coughing) and **postural drainage** is recommended.¹⁴
2. **Manual therapy** to mobilize stiff thoracic and rib joints can assist with thoracic expansion.
3. Consider a pulmonary function test for individuals presenting with pulmonary complications.¹⁵



Cardiac recommendations

1. If cardiac pathology is present, specific cardiac rehabilitation programs should be provided tailored to the individual based on their cardiac complications, impairments and rehabilitation needs assessment.
2. Consider submaximal exercise test, like the **6-Minute Walk Test** to determine exercise tolerance and capacity.
3. Patients returning to physically demanding occupation following confirmed myocarditis require a 3–6 months period of complete rest. The period of rest is dependent on the clinical severity and duration of illness, left ventricular function at the onset, and extent of inflammation.
4. If returning to physically demanding occupation following myocarditis, patients are required to undergo periodic reassessment, in particular during the first 2 years.



Neurological recommendations

1. Consider a cognitive screen (e.g., **dermatomes, myotomes, deep tendon reflexes, and cranial nerve exam**) for individuals presenting with central or peripheral neurological sequelae. A Dix-Hallpike maneuver should be administered for individuals who present with vertigo.
2. Education should be provided that mild-to-moderate neurological symptoms are likely to have a full recovery.

Graduated return to work checklist

Is the individual:

Able to complete regular activities of daily living?	YES/NO
Able to walk ~500m on the flat without excessive fatigue or breathlessness?	YES/NO
At least 7 days symptom-free?	YES/NO

If the individual answered **YES to all of the above**, they may proceed with graduated return to work following medical clearance.

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