Information sources and further reading

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Information sheet 1: What is Long COVID?

Physiopedia – Long COVID:  https://www.physio-pedia.com/Long_COVID#ppm63722

World Physiotherapy response to COVID-19 briefing paper 9 - Safe rehabilitation approaches for people living with Long COVID: physical activity and exercise  

Definition and prevalence of Long COVID


1 in 10 of all cases will exhibit symptoms for a period of 12 weeks or longer


Many people living with the disease were previously fit and healthy.


Children experience Long COVID symptoms similar to adults and at about the same frequency


Long COVID affects people who have been hospitalised with acute COVID-19 and those who recovered at home. Individuals who have experienced either mild or severe COVID-19 can go on to have prolonged symptoms or develop Long COVID.


Long COVID is a multi-system disease; there are over 200 listed symptoms which occur in variable combinations and can fluctuate in both predictable and unpredictable patterns of flares and remissions.

Most common symptoms after 6 months: extreme exhaustion (fatigue); post-exertional symptom exacerbation (PESE); problems with memory and concentration (brain fog)


Other common symptoms for Long COVID


Consensus has not yet been reached on an internationally agreed Long COVID case definition. However, there is mounting evidence that Long COVID is both common and debilitating. Attempts have been made to characterise Long COVID as prolonged with multi-system involvement and significant disability.

The BMJ. NICE guideline on long covid. 23 Dec 2020.


Information sheet 2: Rehabilitation and Long COVID

What is rehabilitation? Rehabilitation is defined as a set of interventions to optimise functioning in everyday activities, support individuals to recover or adjust, achieve their full potential, and enable participation in education, work, recreation and meaningful life roles.


Krug E, Cieza A. Strengthening health systems to provide rehabilitation services. Neuropsychological rehabilitation 2019;29:672-4.


Safe and effective rehabilitation is a fundamental part of recovery.

Rehabilitation for Long COVID must be tailored to the individual, depending on their symptoms, goals and preferences.

BMJ Opinion. We have heard your message about long covid and we will act, says WHO. 2020;2021.


The World Health Organization recommends that Long COVID rehabilitation should include educating people about resuming everyday activities conservatively, at an appropriate pace that is safe and manageable for energy levels within the limits of current symptoms, and exertion should not be pushed to the point of fatigue or worsening of symptoms.


Rehabilitation for individuals recovering from COVID-19 is different for everyone. Here are some terms that may best describe your experience: post-intensive care syndrome; post-viral fatigue; permanent organ damage; long-term COVID; relapses

National Institute for Health Research (NIHR). Living with Covid19 – Second review. 16 March 2021
Regardless of which term fits your symptoms best, your physiotherapist will treat you as an individual and get to know the underlying cause of your symptoms before starting treatment. Miciak MA. Bedside matters: a conceptual framework of the therapeutic relationship in physiotherapy, 2015

Effective rehabilitation interventions to support self-management of symptoms may include: activity pacing; heart rate monitoring

Long COVID - Physiopedia (physio-pedia.com) [includes a list of resources on pacing and heart rate monitoring]


In order to best meet your needs, a physiotherapist will work with other health professionals as part of your assessment and rehabilitation programme. Various tests may be carried out to understand and find the cause of symptoms.

European Society of Cardiology. ESC Guidance for the Diagnosis and Management of CV Disease during the COVID-19 Pandemic. 2020;2021.


Exercise prescription in Long COVID should be approached with care to minimise risk and to ensure exercise programmes are restorative and do not make the individual’s symptoms worse. Rehabilitation should aim to prevent oxygen desaturation on exertion. A specialist respiratory physiotherapist may help where there are signs of hyperventilation and breathing pattern disorders.


Information sheet 3: Fatigue and post-exertional symptom exacerbation

Fatigue is a feeling of extreme exhaustion and is the most common symptom of Long COVID. It:

- is not easily relieved by rest or sleep
- is not the result of unusually difficult activity
- can limit functioning in day-to-day activities
- negatively impacts quality of life


Post-exertional symptom exacerbation (PESE) is a disabling and often delayed exhaustion disproportionate to the effort made. It is sometimes described as a “crash.” The activity that can trigger this worsening of symptoms can be something that was easily tolerated before, such as:

- a daily activity (eg a shower)
- a social activity
- walking (or other exercise)
- reading, writing or working at a desk
- an emotionally charged conversation
- being in a sensory environment (eg loud music or flashing lights)
Many of the symptoms experienced by those living with Long COVID are very similar to those of myalgic encephalomyelitis (ME)/chronic fatigue syndrome (CFS).


The World Health Organization recommends that Long COVID rehabilitation should include educating people about resuming everyday activities conservatively, at an appropriate pace that is safe and manageable for energy levels within the limits of current symptoms, and exertion should not be pushed to the point of fatigue or symptom exacerbation.


PESE is most often triggered by physical activity and exercise. Nearly 75% of people living with Long COVID still experience PESE after 6 months.


The symptoms worsened by exertion can include:

- disabling fatigue/exhaustion
- cognitive dysfunction or “brain fog”
- pain
- breathlessness
- heart palpitations
- fever
- sleep-disturbance
- exercise intolerance


Your physiotherapist can guide you in pacing as an activity management tool that is also used successfully for people with ME/CFS to prevent triggering PESE.

STOP trying to push your limits. Overexertion may harm your recovery.

REST is your most important management strategy. Do not wait until you feel symptoms to rest.

PACE your daily activities and cognitive activities. This is a safe approach to navigate triggers to symptoms.


Physical activity and exercise interventions warrant caution as rehabilitation strategies among people with Long COVID and persistent symptoms of disproportionate breathlessness on exertion, inappropriately high heartbeat (tachycardia), and/or chest pain.

World Physiotherapy Response to COVID-19: Briefing Paper 6 - Safe Rehabilitation Approaches for People Living with Long COVID: Physical Active and Exercise. [Insert link]
Graded exercise therapy should not be used, particularly when post-exertional symptom exacerbation is present.


Torjesen I. NICE advises against using graded exercise therapy for patients recovering from covid-19. BMJ 2020;370:m2912 doi:10.1136/bmj.m2912 [doi] [published Online First: July 21].


Information sheet 4: How to use pacing with your physiotherapist


The following resources were additionally used in the production of this information sheet:

Physios for ME:
- Pacing: https://www.physiosforme.com/pacing
- Heart rate monitoring: https://www.physiosforme.com/heart-rate-monitoring

Royal College of Occupational Therapists:
- How to conserve your energy: https://www.rcot.co.uk/conserving-energy

Emerge Australia - Pacing: https://www.emerge.org.au/Handlers/Download.ashx?IDMF=2a2287ee-b84d-428f-b72e-00da812dd7c


Action for ME – Pacing and energy management: https://www.actionforme.org.uk/get-information/managing-your-symptoms/pacing-and-energy-management/
Information sheet 5: Breathing exercises

Additional reading and resources
Long COVID Physio: https://longcovid.physio/
Physiopedia – Long COVID: https://www.physio-pedia.com/Long_COVID#ppm63722