



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.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

INFORMATION/EDUCATION PAGE

What Do I Need to Know About Long-Covid-related Fatigue, Brain Fog, and Mental Health Changes?



Many people who became ill with COVID-19 continue to experience symptoms over long periods of time. Generally called “Long COVID,” this condition has been given a more formal medical name: Post-Acute Sequelae of Sars-CoV-2, or PASC. There are many symptoms associated with Long COVID. This paper focuses on only 3 of them, in order to be able to cover them in depth: fatigue, brain fog, and mental health changes. This paper offers suggestions on how to manage these symptoms, where to go for help, and how to talk about what you are experiencing to find the support and understanding you need.

How do I know if I am experiencing Long-COVID-related symptoms?

According to the Centers for Disease Control (CDC), people who experience a more severe first-time illness are more likely to develop Long COVID.¹ Symptoms may last for several months or several years. The CDC defines Long COVID in 3 ways²:

- Your symptoms continue after your initial illness has ended, and last longer than 12 weeks.
- Your symptoms return sometime after your initial illness has ended, and then continue for longer than 12 weeks.
- You don’t experience any symptoms during your initial illness, but sometime after your initial illness has ended, symptoms begin to appear and continue for longer than 12 weeks.

What are fatigue, brain fog, and mental health symptoms related to Long COVID?³

- **Fatigue.**⁴ This is the most common symptom reported by people experiencing Long Covid. You may have very little energy or feel burned out. You may feel weighed down. You may be sleepy. You may be out of breath, even when doing simple activities. You may not want to do things you usually like to do. You may even feel that you’ve lost interest in doing anything at all. Here are some quotes from people who have experienced Long-COVID-related fatigue:

“And the fatigue is literally like hitting a wall. I can’t stay awake any more. It’s just like, wow, I have to go to bed.”⁵

“It was just like I’d been run over; you know I felt, gravity felt like it was applying extra on my limbs.”⁶

“(My husband) was sleeping for about 20 hours a day, 20 hours out of every 24 and he’s still sleeping now, five and half months after, he still sleeps an awful lot, sat up, not lay down, sat up, he’s just totally exhausted.”⁶

- **Brain fog.**⁷ This is a term used to describe feeling mentally sluggish and fuzzy. You may have difficulty paying attention or remembering what you are doing. Your thinking and

responses may be slow. You may have trouble following instructions or putting your thoughts into words. You might find it difficult to make simple decisions, plan anything, or focus on more than 1 thing at a time. Here are some quotes from people who have experienced Long-COVID-related brain fog:

*"I can't hold multiple trains of thought [...] If I tell myself I have to water my plants, I must do it before another thought comes into my mind because otherwise I will forget."*⁶

*"I had to terminate many phone calls because I could no longer comprehend the speakers nor communicate clearly with them."*⁸

*"I could not remember how to spell words - also found I was missing words from sentences and sometimes writing things that did not make sense."*⁸

*"I felt lost driving and had to stop and find my position in a GPS to be able to drive back home. It's a route I have done hundreds of times."*⁸

*"I can ask somebody a question and then I'll ask the exact same question 2 min after and not remember I've asked them, I can't remember significant things that have happened in the past either."*⁸

- **Depression.** Depression is a persistent sadness and lack of interest or pleasure in activities that you used to find enjoyable. Even when you do participate in an enjoyable activity, you find that you are still feeling sad and depressed. You may notice changes in your sleep or appetite.

*"Seven months plus in I don't know whether I'm gonna get my brain back (. . .) I'm really, really fearful for the future or whether I'm going to be able to get back to what I want to do and that's like your identity and yourself and who I am as a person is, you know, a big part of me is being an (allied health professional) and if I can't, if I've lost that, I've lost a huge part of me."*⁹

- **Anxiety.** You may be more worried, anxious, nervous, irritable, and on edge than before your illness. You may feel a sense of danger or doom. You may feel panic or emotionally overwhelmed just taking care of daily tasks or responsibilities at home or at work.
- **Insomnia.** You may have a hard time falling asleep or difficulty staying asleep. If you do sleep, it might not be restful sleep and you still feel tired, irritated, depressed, or anxious when you are awake. Not having restful sleep can make all your symptoms feel worse.

Additional quotes from individuals experiencing Long-COVID can be found via this link or code

Link: <https://youtu.be/YpEGEcKEHJw>

Code:



How do I know if my fatigue, brain fog, or mental health symptoms are actually caused by Long COVID?

- Your symptoms appear after your recovery from COVID, or the symptoms that you had never went away.
- Your symptoms seem to get worse after any physical or mental effort. This is sometimes called "post-exertional malaise."
- Pandemic lockdowns and social distancing could have made you feel lonely and anxious, but these symptoms usually diminish over time when you are once again participating in social activities. If your symptoms continue to persist, it is more likely that they are Long COVID related.
- If you are getting enough sleep, haven't had changes in time zones or work shifts, are doing some physical activity during your day, are not under a lot of stress and haven't experienced any dangerous or scary events that could trigger a traumatic reaction, and don't have a history of depression or other health issues, yet you are still feeling these symptoms, they may be Long COVID related.

Which medical and allied health professionals can help me if I am experiencing Long-COVID-related symptoms?

If you contracted COVID and believe you are experiencing fatigue, brain fog, or mental health changes, it is important to share your concerns and seek care from health care professionals who can help you manage your symptoms. There hasn't been much time to research treatments specifically for Long COVID because this is such a recent condition, so doctors are suggesting things that have been shown to help with conditions that cause similar symptoms, such as chronic fatigue syndrome, concussion, stroke, brain injury, and Parkinson's disease.¹⁰⁻¹² Early research indicates that symptoms may be related to changes in multiple bodily systems potentially caused by inflammation, including in brain tissue, the lungs, and the kidneys.¹³⁻¹⁷ Also, your post-COVID symptoms may be hard to diagnose because your routine blood tests, chest x-rays, and electrocardiograms may be normal and many of your symptoms can be similar to other types of conditions. Begin by consulting your **family physician, nurse, or nurse practitioner** for a proper diagnosis. They can arrange for referrals to the following doctors or rehabilitation professionals as needed¹⁸:

- **A neurologist or a psychiatrist** can provide you with the right medications to help you improve your memory or think clearly once again.
- **A neuropsychologist or a cognitive behavioral therapist** can help you find strategies to cope with low mood, heightened anxiety, depression, or sleep changes. You can talk to them about any confusion, memory, attention, or communication challenges. Cognitive therapies and mindfulness strategies might become a helpful part of your daily routine.
- **An occupational therapist** can advise you on strategies to manage your personal level of fatigue, how to avoid what makes it worse, and how to pace yourself to save energy.
- **A physiotherapist** can advise you on what type of exercise or movement would be best for you

and how often to do it so that you can manage your fatigue levels.

- **A nutritionist or dietician** can advise you on the types of foods you may need. They can help you try adjustments in what you eat and drink that might reduce your fatigue or brain fog.
- **A social worker** can connect you to resources in your community, such as support groups, local community centers with movement or meditation classes, or local practitioners who are skilled in treating fatigue, brain fog, and mental health issues.

What can I do myself to manage my symptoms?

At home

- **Try exercise.** Aerobic exercise has been shown to help our brains stay healthy and perform better.¹⁹ Very light aerobic exercise that is adjusted to what you can handle may be helpful. Slowly make increases in the length or intensity of your sessions but watch carefully how that affects your fatigue levels.²⁰
- **Explore non-exercise movement.** Non-exercise practices that focus on flowing and thoughtful movement, such as yoga or tai chi, may be a great option to keep you moving even when your energy is low.²¹ Classes in Alexander technique or Feldenkrais that teach you ways to connect your brain with your movement can bring flow, balance, lightness, and ease into your daily life, and may help in reducing fatigue and brain fog.^{22,23}
- **Be aware of your breathing.** Some breathing practices have been shown to improve concentration and awareness and can reduce anxiety in healthy adults.²⁴ A gentle way to begin is to simply exhale warm air through your mouth, without forcing or pushing. Focusing on your exhales in this way clears the way for a good, easy inhale to follow. Breathe in through your nose without trying to force or pull air in. Let your inhales expand your lungs into your back and sides. Just let your breathing find a natural pace, without trying to control it in any way.
- **Invite restful sleep.** Practice good bedtime "sleep hygiene." Create a 30-minute personal

routine to reinforce in your mind that it's time for sleep. Put away electronics, put on your pajamas, brush your teeth, read or listen to quiet music or a relaxation tape, do some gentle stretching, dim your lights, practice some breathing coordination, meditation, mindfulness practice, or pleasant visualizations.

- **Eat brain healthy foods.** Eat fresh produce and avoid processed foods whenever possible. The Mediterranean diet, which is rich in olive oil, nuts, beans, whole grains, fruits, and vegetables, has been shown to improve general brain health.²⁵ Stay hydrated.
- **Practice patience.** Be kind to yourself. Understand that you are facing a unique health challenge. Pace yourself. Find enjoyment in what you can do and choose to rest when you feel the need.

At work

- **Communicate about your situation.** It is important to talk to your employers about your Long COVID symptoms. They may be able to provide flexible work schedules or offer you health leave. Because Long COVID is an "invisible disability," you need to let your co-workers know about these changes. They need to understand that you may be slower than usual and have less energy. Don't be reluctant to ask for help. Most people want to be supportive.
- **Avoid overexerting yourself.** Try to schedule—or reschedule—tasks for the time of day when you are least fatigued.²⁶
- **Minimize multitasking.** If you are experiencing brain fog, do only 1 task at a time. Work for 10 minutes, take a break for 10 minutes, and then resume. You may also want to reduce the number of screens you have up on your computer at the same time.²⁶
- **Break down work into do-able tasks.** Make notes. Create a series of simple steps when beginning a new task or project. This can help you keep track of a project timeline.

In social settings

- **Communicate about your situation:** It is important to communicate to your family and

friends about your Long COVID symptoms. Again, don't be afraid to ask for help.²⁷

- **Socialize.** While you may want to avoid large group gatherings or noisy environments, certain social activities are great for brain health and may help with your symptoms. Try joining a walking group. Visit a board game café. Attend community classes or events that your local public library is offering.
- **Stay connected in person.** Spending in-person time with your family and friends can boost your mood, your energy, and your brain health.
- **Stay connected across distance.** If you still aren't comfortable getting back to in-person socializing with your friends and family, there are online Long COVID advocacy and support groups that are available for you to join. (See resources below).

Suggestions for friends or family members

Everyone experiences Long COVID differently and may need different types of support. The CDC offers helpful tools to navigate conversations with your friend or family member²⁷:

- **Start a conversation.** Ask open questions, like, "Tell me more about that," or "What else are you feeling?" or "How did things go for you yesterday?"
- **Listen with compassion.** Say things that let them know you have heard them and that you care, like "I'm so sorry you're going through this," or "It must be really frustrating for you".
- **Believe them.** Even if they look fine to you, believe them when they tell you they don't feel well or can't do something they normally could do. Remember, this is an "invisible" disability. You can't always see from the outside what they are experiencing.
- **Find out how you can help them.** Instead of saying, "Let me know if there is anything I can do for you," just offer to do things like mowing their lawn, doing shopping or errands, cooking a meal, or taking them out for lunch or dinner. Be sure to follow through with the help that you offer.

- **Locate resources.** Help them find community services, resources, or activities.
- **Advocate.** Join an advocacy group for people living with Long COVID. Push for research for treatments and services for this growing population.

Suggestions for employers

Employers can help employees experiencing Long COVID symptoms in a number of ways²⁷:

- **Be flexible.** Offer flexible leave and work schedules. Let them work at home if that is feasible. Encourage them to use flex days or sick days to conserve energy so that they are better able to stay at their job until their condition is resolved.
- **Be informed.** Learn about employee programs in your company that could assist them.
- **Adjust the pace.** When interacting, try to speak more slowly, give them time to process your requests, and don't give them too much work at 1 time. Try to spread out assignments over time or to a team of workers.
- **Offer praise.** Let them know when they are doing a good job. Let them know their efforts are appreciated.
- **Believe them.** Even if they look fine to you, believe them when they tell you they don't feel well or can't do something they normally could do. Remember, this is an "invisible" disability. You can't always see from the outside what they are experiencing.

Some useful resources

Understanding contagiousness with Long COVID

If you are experiencing Long COVID-related symptoms, you may have concerns about whether you could still spread the COVID virus. For information on what stages of COVID are actually contagious, please see the link below:

- [https://www.cdc.gov/coronavirus/2019-ncov/your-health/isolation.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%](https://www.cdc.gov/coronavirus/2019-ncov/your-health/isolation.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fyour-health%2Fquarantine-isolation.html)

[2F2019-ncov%2Fyour-health%2Fquarantine-isolation.html](https://www.cdc.gov/coronavirus/2019-ncov/your-health%2Fquarantine-isolation.html)

Long COVID advocacy and support groups

- **Survivor Corps**
Provides information and resources, and a website to share your symptoms and stories and express your frustration to others like yourself.
<https://psychiatry.ucsf.edu/copingresources/long-covid>
- **Long COVID Alliance**
<https://longcovidalliance.org/>
- **Bateman Horne Center**
<https://batemanhornecenter.org/event/online-support-group-13/>
- **Blooming Magnolia**
<https://www.bloomingmagnolia.org/resources>
- **Center for Chronic Illness**
<https://www.thecenterforchronicillness.org/programs-and-services>
- **COVID Survivors for Change**
<https://covidsurvivorsforchange.org/survivor-resources/>

Find the full resource list through the following link or QR code:

Link: <https://drive.google.com/file/d/1HNB99LRzqCsmP55Q64l3-SGciNTFWK-/view?usp=sharing>

Code:



Authorship

This page was developed by the American Congress of Rehabilitation Medicine Cognition in Aging Task Force of the Geriatric Rehabilitation Networking Group, Complementary Integrative Medicine Networking Group, and the Alzheimer's Disease Task Force of the Neurodegenerative Diseases Networking Group members: Monika Gross, BFA, MAmSAT, MATI, RSME; Noemi Maureen Lansang, MS; Urvashy Gopaul, PhD, MSc, PT; Elisa F. Ogawa, PhD; Patricia C. Heyn, PhD, FGSA, FCARM; Flavia H. Santos, PhD; Palavi Sood, PT, PhD; Preeti Pushpalata Zanwar, PhD, MPH, MS; Julie

Schwertfeger, PhD, DPT, MBA, CBIST; and Julie Faieta, PhD, MOT, OTR/L (e-mail address: juf52@pitt.edu).

Disclaimer

This information is not meant to replace the advice of a medical professional and should not be interpreted as a clinical practice guideline. Statements or opinions expressed in this document reflect the views of the contributors and do not reflect the official policy of ACRM, unless otherwise noted. Always consult your health care provider about your specific health condition. This Information/Education Page may be reproduced for noncommercial use for health care professionals and other service providers to share with their patients or clients. Any other reproduction is subject to approval by the publisher.

References

1. CDC. Post-COVID Conditions. Centers for Disease Control and Prevention; 2022. Published September 1. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html>. Accessed November 1, 2022.
2. Cabrera Martimbianco AL, Pacheco RL, Bagatini AM, Riera R. Frequency, signs and symptoms, and criteria adopted for long COVID-19: a systematic review. *Int J Clin Pract* 2021;75:e14357.
3. Deng J, Zhou F, Hou W, et al. The prevalence of depression, anxiety, and sleep disturbances in COVID-19 patients: a meta-analysis. *Ann N Y Acad Sci* 2021;1486:90–111.
4. Aiyegbusi OL, Hughes SE, Turner G, et al. Symptoms, complications and management of long COVID: a review. *J R Soc Med* 2021;114:428–42.
5. Ladds E, Rushforth A, Wieringa S, et al. Persistent symptoms after Covid-19: qualitative study of 114 “long Covid” patients and draft quality principles for services. *BMC Health Serv Res* 2020;20:1144.
6. Kingstone T, Taylor AK, O'Donnell CA, Atherton H, Blane DN, Chew-Graham CA. Finding the ‘right’ GP: a qualitative study of the experiences of people with long COVID. *Open* 2020;4. [bjgpopen20X101143](https://doi.org/10.1186/s13011-020-01143-3).
7. Theoharides TC, Cholevas C, Polyzoidis K, Politis A. Long-COVID syndrome-associated brain fog and chemofog: luteolin to the rescue. *Biofactors* 2021;47:232–41.
8. Davis HE, Assaf GS, McCorkell L, et al. Characterizing long COVID in an international cohort: 7 months of symptoms and their impact. *EClinicalMedicine* 2021;38:101019.
9. Callan C, Ladds E, Husain L, Pattinson K, Greenhalgh T. ‘I can’t cope with multiple inputs’: a qualitative study of the lived experience of ‘brain fog’ after COVID-19. *BMJ Open* 2022;12:e056366.
10. Veronese N, Bonica R, Cotugno S, et al. Interventions for improving long COVID-19 symptomatology: a systematic review. *Viruses* 2022;14:1863.
11. Fowler-Davis S, Platts K, Thelwell M, Woodward A, Harrop D. A mixed-methods systematic review of post-viral fatigue interventions: are there lessons for long Covid? *PLoS One* 2021;16:e0259533.
12. Herrera JE, Niehaus WN, Whiteson J, et al. Multidisciplinary collaborative consensus guidance statement on the assessment and treatment of fatigue in postacute sequelae of SARS-CoV-2 infection (PASC) patients. *PM & R* 2021;13:1027–43.
13. Priya V. NICE guideline on long COVID. *Lancet Respir Med* 2021;9:129.
14. Datta SD, Talwar A, Lee JT. A proposed framework and timeline of the spectrum of disease due to SARS-CoV-2 infection: illness beyond acute infection and public health implications. *JAMA* 2020;324:2251–2.
15. Douaud G, Lee S, Alfaro-Almagro F, et al. SARS-CoV-2 is associated with changes in brain structure in UK Biobank. *Nature* 2022;604:697–707.
16. Shanley JE, Valenciano AF, Timmons G, et al. Longitudinal evaluation of neurologic-post acute sequelae SARS-CoV-2 infection symptoms. *Ann Clin Transl Neurol* 2022;9:995–1010.
17. Frere JJ, Serafini RA, Pryce KD, et al. SARS-CoV-2 infection in hamsters and humans results in lasting and unique systemic perturbations after recovery. *Sci Transl Med* 2022;14:eabq3059.

18. Parkin A, Davison J, Tarrant R, et al. A multidisciplinary NHS COVID-19 service to manage post-COVID-19 syndrome in the community. *J Prim Care Community Health* 2021;12:21501327211010994.
19. Voss MW, Nagamatsu LS, Liu-Ambrose T, Kramer AF. Exercise, brain, and cognition across the life span. *J Appl Physiol* (1985) 2011;111:1505–13.
20. Powell M. Living with Covid19 – Second review. NIHR Evidence; 2020. https://doi.org/10.3310/themedreview_45225.
21. Zou L, Sasaki JE, Wei GX, et al. Effects of mind–body exercises (Tai Chi/Yoga) on heart rate variability parameters and perceived stress: a systematic review with meta-analysis of randomized controlled trials. *J Clin Med* 2018;7:E404.
22. Stallibrass C, Sissons P, Chalmers C. Randomized controlled trial of the Alexander technique for idiopathic Parkinson’s disease. *Clin Rehabil* 2002;16:695–708.
23. Cohen RG, Gurfinkel VS, Kwak E, Warden AC, Horak FB. Lighten up: specific postural instructions affect axial rigidity and step initiation in patients with Parkinson’s disease. *Neurorehabil Neural Repair* 2015;29:878–88.
24. Jerath R, Crawford MW, Barnes VA, Harden K. Self-regulation of breathing as a primary treatment for anxiety. *Appl Psychophysiol Biofeedback* 2015;40:107–15.
25. Petersson SD, Philippou E. Mediterranean diet, cognitive function, and dementia: a systematic review of the evidence. *Adv Nutr* 2016;7:889–904.
26. Episode #68 - COVID-19: Update on Long COVID. Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/media-resources/science-in-5/episode-68-covid-19-update-on-long-covid>. Accessed November 1, 2022.
27. CDC, Coronavirus Disease 2019 (COVID-19). Centers for Disease Control and Prevention; 2020. Published February 11. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/care-post-covid.html>. Accessed November 1, 2022.