

POST COVID-19 CONDITION
OCSO BIWEEKLY SCAN OF EVIDENCE #15
Jan 15-28, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition (commonly referred to as 'long COVID') and synthesizes the current state of knowledge. Comprehensive lists of details and resources on this issue are available at the Office of the Chief Science Officer.

CURRENT STATE OF KNOWLEDGE

The typical duration of acute COVID-19 illness is two to four weeks. However, some patients have described debilitating symptoms persisting or recurring for weeks or months after acute illness. The range of symptoms reported is broad, and can vary from mild to more severe and debilitating effects that can affect both young and older individuals, regardless of the severity of their initial COVID-19 symptoms in the acute stage. These symptoms are often described as, Post COVID-19 condition (WHO terminology), post-acute sequelae of SARS-CoV-2 infection (PASC), and long COVID (used by patient groups). Affected individuals are commonly referred to as COVID-19 long-haulers. While scientific knowledge on these conditions is building, there is still much that is unknown about this condition. There have been reports of more than 100 symptoms or difficulties with everyday activities.

There is limited data suggesting that the condition may be more likely to develop in those:

- who were hospitalized during acute infection;
- had more than 5 COVID symptoms during the acute phase;
- have pre-existing respiratory disease;
- are older;
- are women; and
- have other co-morbidities or have higher BMI.

There are currently no preventative strategies or prognostic markers. Typical therapeutic itinerary involves consultations with multiple specialists and puts emphasis on self-management (rest & relaxation, self-pacing, etc). Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with Post COVID-19 condition. Multidisciplinary teams in "long COVID" clinics have been set to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

It is anticipated that [Post COVID-19 condition](#) will have medium and long-term impact on public health in Canada. Further research with an equity lens on the predisposing conditions and risk factors is needed. Based on research to date, and reviewed by the Public Health Agency of Canada as part of a living [systematic review](#), 56% of individuals who have had COVID-19 reported the presence of one or more symptoms 12 weeks after diagnosis. About [58%](#) of children had 1 or more symptoms 4 weeks or more after their initial COVID-19 infection. Post COVID-19 condition will have implications for the economy, as well as federal programs including disability benefits, employment related measures and sick pay, among others. It is reported that 10% of adults are unable to return to work in the long term. The [WHO](#) has said that about one in 4 people infected with COVID-19 have experienced a post-COVID-19 condition for at least 1 month. One in 10 people experience symptoms lasting beyond 12 weeks.

This week's scan includes a [preprint](#) by Kuodi et al from Israel suggesting that long-COVID symptoms are less likely in vaccinated people, as well as a [study](#) from Switzerland published in *Nature Communications* examining how an immunoglobulin signature (Ig) can predict the risk of post-acute COVID-19 syndrome.

GUIDELINES OR STANDARDS

- The **WHO** has developed a [clinical case definition](#) of post COVID-19 condition by Delphi methodology that includes 12 domains, available for use in all settings. This first version was developed by patients, researchers and others with the understanding that the definition may change as new evidence emerges and our understanding of the consequences of COVID-19 continues to evolve. A separate definition may be applicable for children.
 - *“Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time.”*
 - WHO Q&A [page](#) on Post-COVID-19 Condition (December 2021).
- The U.S. **CDC** describes [Post-COVID conditions](#) as a range of new, returning, or ongoing health problems people experience four or more weeks after first being infected with the virus that causes COVID-19. The CDC highlights the various types of post-COVID conditions such as: Multiorgan Effects of COVID-19, Effects of COVID-19 Illness or Hospitalization, and ‘New or Ongoing Symptoms’. The CDC posted [Interim Guidance](#) for healthcare providers on Evaluating and Caring for Patients with Post-COVID Conditions. Post-COVID conditions can be considered a disability under the [Americans with Disabilities Act \(ADA\)](#). The CDC also released information on [Caring for People with Post-COVID Conditions](#).
- Rapid [guidelines](#) for healthcare professionals by UK **NICE** (Updated November 2021).
- **Chartered Society of Physiotherapy** in UK published its COVID-19 [rehabilitation standards](#), which includes guidance about community-based rehab for people with COVID-19 and long COVID (July 2021).
- [Guidelines](#) to help doctors manage long COVID patients published in *British Journal of General Practice* (August 2021).
- UK **NHS** [guidance](#) for Post-COVID syndrome assessment clinics (April 2021).
- **CIHI** [guidance](#) for clinicians to ensure that data supports monitoring for Post-COVID conditions.
- [Guidance](#) for **Canadian Rehabilitation and Exercise Professionals** on Post COVID-19 condition and rehabilitation management strategies (August 2021).
- **Government of Canada:** [COVID-19 for health professionals - Post COVID-19 condition](#)
- **Center for Effective Practice** – [COVID-19: Clinical Guidance for Primary Care Providers - Long-term symptoms / Post-acute sequelae of COVID-19 \(PASC\)](#)
- [Guideline S1: Long COVID: Diagnostics and treatment strategies](#) (*Wiener klinische Wochenschrift*)
- American Academy of Physical Medicine and Rehabilitation (**AAPM&R**): [Cognitive Symptoms Guidance](#) and [Breathing Discomfort Guidance](#).
- Royal Australian College of General Practitioners (**RACGP**) [guidance](#) for GPs caring for ‘long COVID’ patients.

NATIONAL AND INTERNATIONAL DEVELOPMENTS (JAN 15-28, 2022)

CANADA

- (NEW) [Public Health in Nova Scotia](#) has created an online [survey](#) to help the province track symptoms and impairments that linger after three months. People who've had symptoms or impairments for 3 months can use the website to get help. The online survey is a continuation of a phone-based survey initiated last year. A positive PCR test or an at-home positive rapid test both count as the COVID-19 start date for the survey. About 2,000 people have completed the survey so far. According to national surveys, about 10% of people who get COVID-19 will need support for more than three months.

UK

- (NEW) Vaccination could reduce the risk of long Covid, [research by the Office for National Statistics](#) suggests. ONS found 9.5% of the double-vaccinated group reported long Covid, compared with 14.6% of a socio-demographically matched group who were unvaccinated. There was no statistical evidence that the relationship between vaccination status at the time of infection and the likelihood of subsequently reporting long COVID symptoms differed by whether participants received adenovirus vector (Oxford/AstraZeneca) or mRNA vaccines. Analysis was based on data to 30 November 2021, and longer follow-up time is needed to assess the impact of booster doses and the Omicron variant.

US

- (NEW) CDC has been asked to publicly [report](#) findings on the prevalence of long COVID, including disaggregated demographic data. Lawmakers say minorities may disproportionately suffer from long-term symptoms of coronavirus infection. The [letter](#) requesting the data notes that this will help direct Congressional action to support those with long COVID along with their families and communities.

EMERGING SCIENTIFIC EVIDENCE (JAN 15-28, 2022)

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
Fatigue and cognitive impairment in Post-COVID-19 Syndrome: A systematic review and meta-analysis (Ceban et al)	Systematic Review (Available in <i>Brain Behav Immun</i>)	Searched databases inception to June 8, 2021 on PubMed/MEDLINE, The Cochrane Library, PsycInfo, Embase, Web of Science, Google/Google Scholar, and select reference lists. Literature search yielded 10,979 studies, and 81 studies were selected for inclusion. The fatigue meta-analysis comprised 68 studies, the cognitive impairment meta-analysis comprised 43 studies, and 48 studies were included in the narrative synthesis. Meta-analysis revealed that the proportion of individuals experiencing fatigue 12 or more weeks following COVID-19 diagnosis was 0.32. The proportion of individuals exhibiting cognitive impairment was 0.22. Narrative synthesis revealed elevations in proinflammatory markers and considerable functional impairment in a subset of individuals.

<p>Proposal of a food supplement for the management of post-COVID syndrome (Naureen et al)</p>	<p>Review (Available in <i>Eur Rev Med Pharmacol Sci</i>)</p>	<p>The mechanisms by which the virus causes prolonged illness are still unclear. The aim of this review is to gather information regarding post-COVID syndrome so as to highlight its etiological basis and the nutritional regimes and supplements that can mitigate, alleviate or relieve the associated chronic fatigue, gastrointestinal disorders and continuing inflammatory reactions. Naturally-occurring food supplements, such as acetyl L-carnitine, hydroxytyrosol and vitamins B, C and D hold significant promise in the management of post-COVID syndrome. In this pilot observational study, we evaluated the effect of a food supplement containing hydroxytyrosol, acetyl L-carnitine and vitamins B, C and D in improving perceived fatigue in patients who recovered from COVID-19 but had post-COVID syndrome characterized by chronic fatigue. Results suggest that the food supplement could proceed to clinical trials of its efficacy in aiding the recovery of patients with long COVID.</p>
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SELECT PRIMARY RESEARCH

TITLE AND AUTHOR	SOURCE	SUMMARY
<p>Long-term perturbation of the peripheral immune system months after SARS-CoV-2 infection (Ryan et al)</p>	<p><i>BMC Med</i></p>	<p>An integrated analysis of immune responses in blood at a transcriptional, cellular, and serological level at 12, 16, and 24 weeks post-infection (wpi) in 69 patients recovering from mild, moderate, severe, or critical COVID-19 in comparison to healthy uninfected controls. Anti-Spike and anti-RBD IgG responses were largely stable up to 24 wpi and correlated with disease severity. There were significant differences in multiple innate and adaptive immune populations in convalescent individuals compared to healthy controls, which were most strongly evident at 12 and 16 wpi. RNA sequencing revealed significant perturbations to gene expression in COVID-19 convalescents until at least 6 months post-infection. We also uncovered significant differences in the transcriptome at 24 wpi of convalescents who were referred to a long COVID clinic compared to those who were not.</p>
<p>Effects of exercise rehabilitation in patients with long COVID-19 (Barbara et al)</p>	<p><i>Eur J Prev Cardiol</i></p>	<p>Evaluated whether exercise rehabilitation program could be applied in a population of patients with long COVID-19. The patients started a laboratory controlled eight weeks exercise training program, which included three exercise sessions a week. In each exercise session, aerobic exercise (starting 30 min and increasing to 60 min) was performed, including 5 min warm-up and 5-min cool down. VO₂peak increased 15% and peak ventilation 9%. Eighteen patients (36.0%) had a post-training predicted VO₂peak above 85% (indicating normality). Muscle strength increased markedly for all major muscle groups ranging from 16% to 33% increase.</p>
<p>Changes in Physical Activity and the Occurrence of Specific Symptoms of “Long-COVID Syndrome” in Men Aged 18–25 (Sojka et al)</p>	<p><i>Int J Environ Res</i></p>	<p>Aim of study was to assess the occurrence of non-specific symptoms of “long-COVID syndrome” depending on the physical activity undertaken resulting from the imposed forms of study (distance learning–contact learning); 136 men aged 21.5 ± 1.58 from universities educating students of medical faculties were examined. Among the respondents, 17% in Group I and 16% in Group II were infected with the SARS-CoV-2 virus, including 50% in Group I with moderate symptoms, and in Group II—most people 45% with mild symptoms. The conducted research shows a number of important problems, such as reduced physical activity, as well as increased body weight and time spent in front of the monitor.</p>
<p>Immunological dysfunction persists for 8 months following initial mild-to-moderate SARS-CoV-2 infection (Phetsouphanh et al)</p>	<p><i>Nat Immunol</i></p>	<p>Studied individuals with post-acute COVID syndrome (long COVID (LC)) compared to age- and gender-matched recovered individuals without LC, unexposed donors and individuals infected with other coronaviruses. Patients with LC had highly activated innate immune cells, lacked naive T and B cells and showed elevated expression of type I IFN (IFN-β) and type III IFN (IFN-λ1) that remained persistently high at 8 months after infection.</p>
<p>Patient-related outcomes in patients referred to a respiratory clinic with persisting symptoms</p>	<p><i>Chron Respir Dis</i></p>	<p>Described the ongoing symptoms, quality of life and return to work status in a cohort of non-hospitalised COVID-19 survivors with persisting respiratory symptoms presenting to clinic, who consented and completed patient-reported outcome measures. We identified fatigue, reduced quality of life and dysregulated</p>

following non-hospitalised COVID-19 (Harvey-Dunstan et al)		breathing alongside the breathlessness. Those with co-existent fatigue had worse mood and quality of life and were less likely to have returned to normal working arrangements compared to those without fatigue.
Long COVID in the Faroe Islands: A Longitudinal Study Among Nonhospitalized Patients (Petersen et al)	<i>Clin Infect Dis</i>	This longitudinal study presents symptoms registered during the acute phase as well as long COVID in patients from the Faroe Islands. Results show that of the 180 participants (96.3% of the 187 eligible COVID-19 patients), 53.1% reported persistence of at least 1 symptom after a mean of 125 days after symptoms onset, 33.0% reported 1 or 2 symptoms, and 20.1% reported 3 or more symptoms. At the last follow-up, 46.9% were asymptomatic compared with 4.4% during the acute phase. The most prevalent persistent symptoms were fatigue, loss of smell and taste, and arthralgias.
Association between vaccination status and reported incidence of post-acute COVID-19 symptoms in Israel: a cross-sectional study of patients tested between March 2020 and November 2021 (Kuodi et al)	<i>medRxiv</i>	Study aimed to determine whether vaccination was associated with the incidence of reporting long-term symptoms post-SARS-CoV-2 infection. After adjusting for follow-up time and baseline symptoms, those who received two doses less likely than unvaccinated individuals to report any of these symptoms by 64%, 54%, 57%, and 68% respectively, (Risk ratios 0.36, 0.46, 0.43, 0.32, $p < 0.04$ in the listed sequence). Those who received two doses were no more likely to report any of these symptoms than individuals reporting no previous SARS-CoV-2 infection.
Incidence and risk factors of long COVID in the UK: a single-centre observational study (Nune et al)	<i>J R Coll Physicians Edinb</i>	Evaluated the presence of long COVID and its risk factors in patients discharged from a hospital with COVID-19 illness. This observational study included 271 COVID-19 patients admitted between February and July 2020 in a hospital in the UK. Out of 89 patients interviewed, 55 (62%) had long COVID for 3 months, 46 (52%) for 6 months and 37 of the 75 patients admitted to the hospital with acute COVID-19 had long COVID for 9 months (49%). The most common long COVID symptoms were fatigue and breathlessness. Nearly two-thirds of patients at 3 months and a half at 9 months had long COVID. COVID-19 pneumonia was the strongest predictor of long COVID in Caucasians at 3 months.
Characterizing long COVID in an international cohort: 7 months of symptoms and their impact (Davis et al)	<i>EClinicalMedicine</i>	Conducted an online survey of people with suspected and confirmed COVID-19, distributed via COVID-19 support groups and social media from September 6, 2020 to November 25, 2020. We analyzed responses from 3762 participants with confirmed (diagnostic/antibody positive; 1020) or suspected (diagnostic/antibody negative or untested; 2742) COVID-19, from 56 countries, with illness lasting over 28 days and onset prior to June 2020. For the majority of respondents (>91%), the time to recovery exceeded 35 weeks. The most frequent symptoms after month 6 were fatigue, post-exertional malaise, and cognitive dysfunction. Patients with Long COVID report prolonged, multisystem involvement and significant disability. By seven months, many patients have not yet recovered (mainly from systemic and neurological/cognitive symptoms), have not returned to previous levels of work, and continue to experience significant symptom burden.
Impact of persistent COVID-19 symptoms on social life of female long haulers: A qualitative study (Aghaei et al)	<i>medRxiv</i>	Conducted 15 semi-structured interviews with female long haulers in the United States purposely recruited from Facebook groups, Slack groups, and organization websites. Persistent COVID-19 symptoms negatively affected female long haulers' social lives in many aspects including physical function, financial security, social relationship, conflict of social roles, and social stigma. Physical limitations changed their body image. Social isolation and work-family conflicts caused huge stress. They experienced internalization of stigma and job insecurities. Shifting to new methods of communication, especially social media may buffer the negative effects of social isolation because of long COVID.
The Effects of Messaging on Expectations and Understanding of Long COVID: An Online Randomised Trial (Bhagal et al)	<i>medRxiv</i>	Examined whether providing different types of information about Long COVID would affect expectations about the illness. We found a main effect of illness description: individuals reported longer symptom duration and less illness coherence when the illness was described as Long COVID (compared to ongoing COVID-19 recovery). There was a main effect of illness uncertainty: when uncertainty was emphasized, participants reported longer expected symptom duration, less treatment control, and less illness coherence than when uncertainty

		was not emphasized. There was also a main effect of efficacy of support: participants reported higher personal control and higher treatment control when support was enhanced (compared to basic support).
Long COVID-19: Objectifying most self-reported neurological symptoms (Bungenberg et al)	<i>Ann Clin Transl Neurol</i>	Aimed to objectify and compare persisting self-reported symptoms in initially hospitalized and non-hospitalized patients after infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by applying clinical standardized measures. Fifty patients with persisting symptoms for at least 4 weeks were included and classified by initial hospitalization status. In both groups, fatigue severity was associated with reduced performance in attention and psychomotor speed tasks and reduced quality of life and with more persisting symptoms. PROMs identified fatigue, reduced sleep quality, and increased anxiety and depression in both groups but more pronounced in non-hospitalized patients.
Female Sex Is a Risk Factor Associated with Long-Term Post-COVID Related-Symptoms but Not with COVID-19 Symptoms: The LONG-COVID-EXP-CM Multicenter Study (Fernández-De-las-peñas et al)	<i>J Clin Med</i>	Multicenter cohort study investigated the differences between coronavirus disease 2019 (COVID-19) related symptoms and post-COVID symptoms between male and female COVID-19 survivors. The number of post-COVID symptoms was 2.25 for females and 1.5 for males. After adjusting by all variables, female sex was associated with ≥ 3 post-COVID symptoms, the presence of post-COVID fatigue, dyspnea, pain, hair loss, ocular problems, depressive levels and worse sleep quality.
Evaluation of 3-month follow-up of patients with postacute COVID-19 syndrome (Kerget et al)	<i>J Medical Virol</i>	Study aimed to evaluate patients with postacute COVID-19 over 12 weeks of follow-up. The patients were divided into three groups based on COVID-19 severity: nonsevere pneumonia (Group 1), severe pneumonia (Group 2), and severe pneumonia requiring intensive care (Group 3). Evaluation of laboratory parameters at 4 and 12 weeks showed that Group 3 had a higher lactose dehydrogenase (LDH) level and a lower mean platelet volume than the other groups at both time points. Group 3 also had lower percent predicted forced vital capacity (FVC%), percent predicted forced expiration volume in 1 s (FEV1%), and percent predicted diffusion capacity of the lungs for carbon monoxide divided by alveolar volume (DLCO/VA%) compared to Groups 1 and 2 at Week 4 and compared to Group 1 at 12 weeks. Patients with persistent dyspnea at 12 weeks had significantly lower FEV1%, FVC%, DLCO/VA%, and saturation levels in room air and significantly higher LDH, pro-BNP, D-dimer, and heart rate compared to those without dyspnea.
"I feel like my body is broken": Exploring the experiences of people living with long COVID (Wurz et al)	<i>medRxiv</i>	Objective of study was to better understand and explore individuals' experiences with long COVID and commonly reported symptoms, using qualitative data collected from 213 adults living with long COVID following a confirmed or suspected SARS-CoV-2 infection who participated in a larger observational, online survey. Four overlapping and interconnected themes were identified: (1) My long COVID symptoms are numerous, hard to describe, and debilitating, (2) All aspects of my day-to-day functioning have been impacted, (3) I can no longer be physically active, and (4) I keep asking for help, but no one is listening, and very little is working.
Post-COVID-19 Memory Impairment: Prevalence and Associated Factors (Ahmed et al)	<i>medRxiv</i>	Purpose of research was to determine the prevalence of memory impairment in post-COVID-19 patients and to find potential contributing factors. Memory impairment was prevalent in 19.2% of the post-COVID patients. Individual predictor analysis revealed that among the treatment modalities, steroids and antibiotics were associated with impaired memory.
Health Status, Persistent Symptoms, and Effort Intolerance One Year After Acute COVID-19 Infection (Kingery et al)	<i>J Gen Intern Med</i>	Study examined long-term prevalence and risk factors for post-acute COVID-19 sequelae (PASC). Survey respondents were survivors of acute COVID-19 infection requiring Emergency Department presentation or hospitalization between March 3 and May 15, 2020. 41.5% reported worse health compared to a year prior, 44.2% reported persistent symptoms, 36.2% reported limitations in lifting/carrying groceries, 35.5% reported limitations climbing one flight of stairs, 38.1% reported limitations bending/kneeling/stooping, and 22.1% reported limitations walking one block. The median time between hospital presentation and survey was 332 days.

COMMENTARIES, LETTERS AND OPINION PIECES (JAN 15-28, 2022)

- [The blood markers that could help to diagnose long COVID \(Nature\)](#): Levels of some immune molecules are unusually high in people with persistent symptoms after infection with SARS-CoV-2. Chansavath Phetsouphanh at the University of New South Wales and his colleagues analysed blood samples from people with long COVID and found that a SARS-CoV-2 infection elicits an immune response distinct from that of other types of coronavirus, such as those that cause the common cold. This response persists in people experiencing long COVID. The team's analysis pointed to a collection of immune-system molecules that remained abnormally high in individuals with long COVID eight months after infection. These molecules, such as type 1 and type 3 interferons, are usually made at the time of a viral infection. They activate immune cells called T cells and trigger inflammation.
- [Long COVID and self-management \(The Lancet\)](#): There is an absence of research on self-management practices among individuals with long COVID. Patients and patient advocacy groups have reported an absence of timely support and poor recognition of long COVID, partly attributable to insufficient knowledge and evidence of long COVID and overwhelmed health-care systems. Insufficient support has led to loss of faith and disappointment in health-care service delivery, leading people with long COVID to seek alternative sources of support and treatment.
- [Do vaccines protect from long COVID? \(The Lancet\)](#): The data on long COVID are worrying, particularly during the current increase in global cases of COVID-19 infection. There are, however, encouraging emerging data that individuals who are vaccinated against COVID-19 are less likely to report long COVID symptoms. A case-control study of 1.2 million users of a COVID symptom tracker app in the UK showed that there were lower odds of symptoms lasting 28 days or more in individuals who had received two vaccine doses.

MEDIA HIGHLIGHTS

CANADA

- [Researchers predict risk of long COVID with patients' blood \(CTV News\)](#): By looking at COVID-19 patients' blood, researchers in Switzerland have identified an antibody "signature" that can be used to predict the risk of long-term complications like extreme fatigue and shortness of breath. They also found other risk factors for what's known as long COVID, including the severity and number of initial symptoms, and a previous history of asthma. In [the study](#), which was published in *Nature Communications*, researchers compared 40 healthy people with 175 COVID-19 patients at four hospitals in Switzerland. The patients were assessed and given blood tests during their initial infection, about six months later, and again after approximately one year. By analyzing their blood, researchers were able to see that comparatively low levels of antibodies immunoglobulin M (IgM) and immunoglobulin G3 (IgG3) soon after infection correlated to an increased risk of long COVID.
- [How a rise in long-haul COVID-19 symptoms could be a 'mass disabling event' \(CTV News\)](#): Given that surging COVID-19 cases could result in an increase in the number of Canadians living with disabilities due to long-haul symptoms, Arya says it underscores the need to strengthen disability supports such as access to rehabilitation centres and social assistance. The federal government [introduced Bill C-35](#), which would create the Canada Disability Benefit and provide a basic income support for low-income Canadians with disabilities. Disability advocates are urging the feds to fast-track the bill.
- [Long COVID will have health, economic impact for years to come, says expert \(CBC News\)](#): Omicron will lead to 'tsunami' of long COVID cases, says sufferer behind support group. Prince Edward Island and the rest of the Maritime provinces have done "extraordinarily well" keeping COVID-19 in check, says a member of the Ontario Science Table. But Omicron has changed the playing field, says Dr. Fahad Razak, and now P.E.I. and even the territories need to be prepared for what comes after COVID: long COVID. Of the 6,800 total cases on the Island since the pandemic began, 94% occurred after Dec. 15, 2021. A report co-authored by Razak for the Ontario Science Table forecasted that 10 to 14% of Ontarians who contracted COVID would end up with long COVID.

GLOBAL

- [How Europe is approaching long covid \(BMJ\)](#): In the European Union, specialist long covid clinics are reported to be operating in Belgium, France, Germany, and Spain, among others, but these rarely cater for more than a small part of the population. In Italy, no government funded clinics for long covid have yet been established. In May 2021, the Italian government allocated around €28m for 2021 and €24m for 2022, to the “respiratory care” of covid-19 patients who had been admitted to hospital. In Spain, two doctors recently received a grant of €1.8m from the Spanish government to open a clinic for long covid patients. German Ministry of Education and Research has allocated €6.5m to 10 projects investigating the condition. French government’s budget for long covid research is €2.2m, according to France. UK has allocated nearly £20m in funding to research the condition.
- [Long Covid-19: drug trial results to watch in 2022 \(Clinical Trials Arena\)](#): At least four long Covid-19 drug trial readouts are expected in 2022 that could shape the future of the therapeutic space. Axcella Health, PureTech, MGC Pharma, and 9 Meters Biopharma each have Phase II readouts expected this year for long Covid-19, or post-acute sequelae of SARS-COV-2 infection (PASC). Each asset targets a different class of long Covid-19 symptoms, ranging from exertional fatigue to breathing complications. At least six more long Covid-19 trials have expected completions dates in 2022, though no established timelines for results.

POST-COVID-19 RESOURCES

- Pre-populated literature searches: [Long COVID search](#) (LitCovid) and [Long COVID search](#) (NIH)
- [British Heart Foundation \(UK\)](#): UK-based foundation with resources on long COVID.
- [COVID Long Haul \(Canada\)](#): Canada’s largest online platform for COVID survivors, their family members and anyone searching for the most up-to-date information about the pandemic. There is a COVID long-haulers [support group](#) and a [Report on Pan-Canadian Long COVID Impact Survey \(PDF\) \(June 2021\)](#)
- [BC ECHO for Post-COVID-19 Recovery \(Canada\)](#): BC ECHO for Post-COVID-19 Recovery is a learning community of specialists and community health-care providers who use case-based learning to improve care for those recovering from [symptoms post-COVID-19](#).
- [Long Covid Support \(UK\)](#): Peer support and advocacy group aiming to facilitate international peer support and campaigning in the UK for recognition, rehabilitation and research into treatments.
- [Long COVID SOS \(UK\)](#): Long-term sufferers formed the LongCovidSOS campaign to put pressure on the UK government to recognise the needs of those with Long Covid, and to raise awareness among the general public and employers.
- [Survivor Corps \(US\)](#): One of the largest and fastest growing grassroots movements connecting, supporting, and mobilizing COVID-19 Survivors to support research. They have a [list](#) of Post-COVID Care Centers (PCC) and a PCCC Best Practices [Guide](#).
- [The Center for Chronic Illness \(US\)](#): Aims to promote well-being and decrease isolation for those impacted by chronic illness through support and education. Their online support groups are professionally-facilitated and offer psychoeducational tools for coping.
- [Blooming Magnolia \(US\)](#): Mission is to empower others by providing a platform to strengthen & protect mental health and support those afflicted with Long-Covid through education and funding of therapeutic research. They have a list of support groups and resources on their website.
- [Long COVID Alliance \(US\)](#): US-based network of patient-advocates, scientists, disease experts, and drug developers who have joined together to leverage their collective knowledge and resources to educate policy makers and accelerate research to transform our understanding of post-viral illness.
- [Long COVID Kids \(UK/US/Canada\)](#): Parent & patient led advocacy & support group based in the UK.
- [Long COVID Physio \(US & UK\)](#): International peer support, education and advocacy group of Physiotherapists living with Long COVID, founded in November 2020 by Physiotherapists living with Long COVID from the UK and US.

- [Patient-Led Research Collaborative \(Global\)](#): Group of Long COVID patients working on patient-led research around the Long COVID experience.
- [CANCOV- Patient resources \(Canada\)](#): CANCOV is a research platform grounded in a prospective longitudinal 1-year cohort study of patients infected with COVID-19.
- [COVID Patient Recovery Alliance \(CPRA\) \(US\)](#): CPRA aims to bring together leaders in business, health care, research, academia, data and analytics, and patient advocacy to develop solutions that coordinate diverse data sources, inform models of care, and ensure adequate payment for long-COVID patients. Their [report](#) outlines recommendations for federal policymakers to promote recovery.
- [British Lung Foundation \(UK\)](#): UK-based charity sharing resources on navigating the NHS, breathlessness support, movement and energy support for long COVID patients.
- [Webinar - Implications of Long COVID \(Canada\)](#): October 2021 CADTH webinar with expert panel discussing what is known know about long COVID, long COVID clinics, and what needs to be done to ensure quality of care.
- [Living with Long COVID \(US\)](#): COVID-19 Long-Haulers and Post-COVID Support Community.
- [ECDC](#): Webinar on post-COVID-19 condition in children (December 7).

Note: Previous OCSO Post COVID-19 Condition Scans can be found [here](#).