

**POST COVID-19 CONDITION**  
**OCSO BIWEEKLY SCAN OF EVIDENCE #11**  
*Nov 6-19<sup>th</sup>, 2021*

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## SCOPE

This monthly 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.

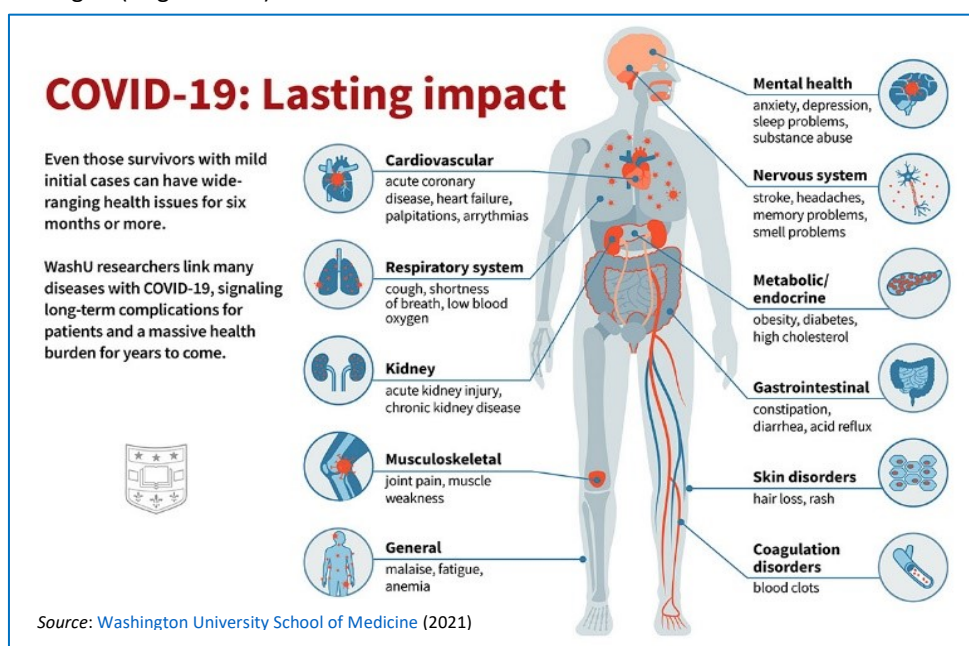
There are currently no preventative strategies or prognostic markers. Typical therapeutic itinerary involves consultations with multiple specialists and puts emphasis on self-management (rest & relaxation, self-pacing, etc.) Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with Post COVID-19 condition. Internationally, 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. 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.

This month's scan includes a [study](#) investigating a third dose Pfizer vaccine and its response on long COVID after breakthrough infections, as well as a systematic [review](#) examining the global prevalence of long COVID.

## EMERGING GUIDELINES OR STANDARDS

- The **World Health Organization** 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.”*
- 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](#).
- **(NEW)** Rapid [guidelines](#) for healthcare professionals by UK **NICE** were updated in November 2021.
- The 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 were published in August 2021 in *British Journal of General Practice*.
- 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).



## NATIONAL AND INTERNATIONAL DEVELOPMENTS

### CANADA

- In Canada, **11 public clinics** have been identified so far:
  - Alberta: [Rockyview General Hospital](#), [Peter Lougheed Centre](#), [Primary Care Network: Edmonton North](#)
  - British Columbia: [Abbotsford Regional Hospital](#), [Jim Pattison Outpatient Care and Surgery Centre](#), [Vancouver General Hospital](#), [St. Paul's Hospital](#)
  - Ontario: **(NEW)** [Halton Healthcare Post COVID-19 Syndrome Clinic](#), [London Health Sciences Centre](#), [Toronto Rehabilitation Institute](#) (UHN)
  - Quebec: [Montreal Clinical Research Institute Post-COVID-19 Clinic](#), [Clinique ambulatoire post-COVID \(in French only\)](#)
  - There are also **39 private clinics across Canada**.
- Lifemark Health Group has a [Post COVID-19 Rehabilitation and Recovery Program](#) with locations across 6 provinces.
- Alberta Health Services developed a [resource](#) to support rehabilitation and allied health providers across the care continuum working with patients recovering from symptoms of COVID-19.
- Hôtel-Dieu Grace Healthcare launched a COVID Recovery [program](#) to help people suffering from effects of COVID-19.
- Nova Scotia launched a [website](#) with information on managing or treating the lingering symptoms of COVID-19.
- [The Other Pain Clinic Inc COVID Rehab & Survivorship Program](#) in Alberta aims to treat people with post COVID symptoms to allow them to have a better quality of life. The program also has a virtual care option.

### PHAC AND PARTNER ACTIVITIES:

- Monitoring latest research and evidence on Post COVID-19 condition and engaging with national and international experts.
  - PHAC published an *updated* living systematic [review](#) on the prevalence of Post COVID-19 condition. 2 new reviews are also being undertaken to gain a better understanding of 1) risk factors associated with the condition and 2) possible interventions to prevent the condition.
  - CPHO released a [statement](#) about Post COVID-19 Condition on July 7<sup>th</sup>, 2021.
  - Web content on Post COVID-19 Condition is published on the Government of Canada's [website](#).
- PHAC is exploring data sources for **surveillance**
  - [Canadian Primary Care Sentinel Surveillance System](#)
  - Initial environmental scan of provincial/territorial initiatives examining impact of COVID-19 on vulnerable populations using administrative health data.
- **CIHR COVID-19 Rapid Research Funding Opportunity (May 2020)**
  - Over 10 projects directly examining long-term implications of COVID-19 (Figure 2, *Appendix*).
  - [Canadian COVID-19 Prospective Cohort Study \(\\$~2.7M\)](#): Evaluating early to 1-year outcomes in 2000 patients across AB, BC, ON, & QC with COVID-19 infection.
- **CIHR Emerging COVID-19 Research Gaps and Priorities Funding Opportunity (March 2021)**
  - Specific research focusing on identifying, defining & addressing Post COVID-19 condition to understand biological & psychological impacts. Select funded projects can be found in *Appendix (Figure 3)*.

### UK

- [NIHR & UKRI](#):
  - Previous calls: **~£25M** to better understand long-term effects of COVID-19 on physical & mental health
  - Current call: **~£20M** focused on non-hospitalized adults & children with post COVID-19 condition
  - NIHR awarded **£19.6M** to 15 projects across the UK to help diagnose and treat long COVID.
- [NHS England and NHS Improvement](#) will provide **£70 million** to expand long COVID services beyond Post-COVID Assessment Clinics to strengthen treatment and rehabilitation.
- Additional funding for ICSs adding to £24 million already provided to **89** specialist [Post-COVID Assessment Clinics](#) around England, bringing total investment in 2021/22 to **£94 million**. NHS will also establish specialist long COVID services for [children and young people](#).

- UK Office for National Statistics released [statistics](#) on long COVID showing overall UK prevalence estimate of **1.5%**. Research shows **2 million** people in England may have had long COVID, with women and lower-income people particularly susceptible.
- NHS [Your COVID Recovery](#) platform is an online, tailored rehabilitation program that enables patients to be monitored by local rehabilitation teams to ensure they are on track with their care.
- The PHOSP COVID study is a [national consortium](#), led by experts in the UK, to investigate long term impacts of COVID-19 on health outcomes for patients who were hospitalised due to COVID-19. Data that is collected during the study will be used [globally](#), collaborating with the [European Respiratory Society](#) and [Canadian Thoracic Society](#), to understand the long terms impacts of COVID-19 on health worldwide.
- Up to 1 in 7 (14%) children and young people who caught SARS-CoV-2 may have symptoms linked to the virus 15 weeks later, according to preliminary findings from the [world's largest study on long COVID in children](#).
- [UK Collaborative on Development Research](#) highlighted there's over **121** long COVID projects, involving **\$205 million** funding investment, with the top funder being UKRI (as of July 2021).
- [Guidance](#) for people suffering from long COVID has been launched by the NHS 24 (Scotland).

## US

### Post-Acute Sequelae of SARS-COV-2 Infection Initiative ([NIH PASC](#)): \$1.15B/4 years

- Focus: Understand biological basis of PASC & factors contributing to vulnerability
- Current call: Recovery Cohort Studies, Clinical Science, Data Resource & PASC Biorepository Cores
- [NIH](#) has invested in longitudinal studies to record the recovery paths of ~40,000 adults and children in a 'meta-cohort', to observe who develops long-term effects and who doesn't.
- Based on [media](#) reports, **80 post-COVID-19 clinics** were actively engaging with COVID-19 patients as of March 2021. 64 of these clinics surveyed have seen a combined total of ~**10,000 patients**. A [Becker's Hospital Review](#) article (Aug 2021) stated that **44** hospitals and health systems have launched post-COVID-19 clinics. **11.1 million** Americans are living with long COVID, according to the American Academy of Physical Medicine & Rehabilitation.
- Virtua Health offers a nationwide "[Care After COVID](#)" program to help those experiencing post COVID symptoms.
- A **\$40 million** multi-year [study](#) from Children's National Hospital and NIAID examining long-term effects of COVID-19 and multisystem inflammatory syndrome in children.
- NIH has created the [REsearching COVID to Enhance Recovery \(RECOVER\) Initiative](#) and awarded **\$470 million** to create a national study population of volunteers, as well as support studies on long-term effects of COVID-19.
- Brown School of Public Health launched the long COVID [initiative](#) to examine the social and economic impacts of long COVID — including on the workplace — through an equity lens, with the goal of developing policy recommendations.
- [NIH](#) to study long-term effects of COVID-19 in pregnancy by following up to 1,500 pregnant patients with COVID-19 and their offspring for 4 years, as part of NIH's RECOVER initiative.
- **(NEW)** [NIH](#) to study effects of COVID-19 infection on 1000 children over 3 years as part of [RECOVER](#) initiative.

## EMERGING SCIENTIFIC EVIDENCE

### EVIDENCE PRODUCTS (NOV 6-NOV 19, 2021)

TITLE	EVIDENCE TYPE	SUMMARY
<a href="#">Long COVID and oral health care considerations</a> (France et al)	Review (Available in <i>J Am Dent Assoc</i> )	Oral health care professionals must be aware of long COVID, an increasingly prevalent condition with a widely variable presentation and impact. Oral health care professionals should be prepared to treat patients safely in an outpatient oral health setting. Recommendations for the treatment of affected people in an oral health care setting are presented, including a thorough evaluation of the patient history and current status, understanding of how related symptoms may affect oral health care interventions, and which modifications to treatment are needed to provide safe and appropriate care.

<a href="#">Recommendations for outpatient respiratory rehabilitation of long COVID patients</a> (García-Saugar et al)	Review (Available in <i>An Sist Sanit Navar</i> )	The sequelae of COVID-19 have highlighted importance of rehabilitation in persistent COVID patients, involving different professionals in process. This literature review offers ten key aspects of respiratory physiotherapy, including assessment, parameters to monitor, and warning signs,
<a href="#">Global Prevalence of Post-Acute Sequelae of COVID-19 (PASC) or Long COVID: A Meta-Analysis and Systematic Review</a> (Chen et al)	Systematic Review (Available in <i>medRxiv</i> )	Aim of this study is to examine prevalence of post-acute sequelae of COVID-19 (PASC) across the world and to assess geographic heterogeneities through a systematic review and meta-analysis. A second aim is to provide prevalence estimates for individual symptoms that have been commonly reported as PASC, based on existing literature.
<a href="#">The microvascular hypothesis underlying neurologic manifestations of long COVID-19 and possible therapeutic strategies</a> (Research Accessibility Team)	Review (Available in <i>medRxiv</i> )	Low-cost therapies and repurposing of readily available anti-inflammatory medications may prove vital in the management of long COVID symptoms. These findings provide a potential therapeutic option to alleviate the neurological sequelae in patients with long COVID. Clinical trials should be tailored to confirm the effect of such medications on improving long COVID syndrome.

### SELECT PRIMARY RESEARCH (NOV 6-NOV 19, 2021)

TITLE	SOURCE	SUMMARY
<a href="#">Natural therapeutic factors in medical rehabilitation of patients with post-covid-19 at outpatient treatment stage</a> (Kaisinova et al)	<i>Georgian Med News</i>	Aim was to study therapeutic efficiency of medical rehabilitation of patients with Post-COVID-19 syndrome at outpatient treatment stage including natural therapeutic factors and phyto products in rehabilitation programme. Patients of main group had reduction of apnea, increase in adaptation capacity, improvement of physical activity, and normalization of hemodynamic parameters.
<a href="#">Post-covid-19 syndrome: The new pandemic affecting healthcare workers and how the frontline warriors are battling it</a> (Rao et al)	<i>Indian J Palliat Care</i>	Study explored health, social and psychological impact on healthcare workers who recovered from active COVID-19 illness and highlighted their needs post-recovery. In post-recovery period, 66% experienced health issues and fatigue on mild exertion was most common symptom (42%). 82% HCW felt need for a post-COVID-19 recovery health care unit. 35% of HCW experienced fear of developing post-COVID-19 complications.
<a href="#">Recovery from Covid-19 critical illness: A secondary analysis of the ISARIC4C CCP-UK cohort study and the RECOVER trial</a> (Pauley et al)	<i>J Intensive Care Soc</i>	Aimed to compare prevalence and severity of fatigue in survivors of Covid-19 versus non-Covid-19 critical illness, and to explore potential associations between baseline characteristics and worse recovery. At 6-months, prevalence and severity fatigue were less in Covid-19 cohort.
<a href="#">Long-Term Coronavirus Disease 2019 Complications in Inpatients and Outpatients: A One-Year Follow-up Cohort Study</a> (Liao et al)	<i>Open Forum Infect Dis</i>	Patients healed from COVID-19 from February 2020 to May 2020 were considered for this study, regardless of severity of disease during acute phase. Most prevalent symptoms were fatigue (52%), pain (48%), and sleep disorders (47%). Sensory alterations were present in 28% of surveyed patients. 12 months after acute infection, COVID-19 survivors were still suffering from symptoms identified at shorter follow-up.
<a href="#">Postacute Sequelae of SARS-CoV-2 Infection and Impact on Quality of Life 1-6 Months after Illness and Association with Initial Symptom Severity</a> (O'Keefe et al)	<i>Open Forum Infect Dis</i>	Participants discharged from outpatient telemedicine program for COVID-19 were emailed survey about ongoing symptoms, acute illness severity, and quality of life. 290 patients completed the survey, 39% reported persistent symptoms including fatigue, dyspnea on exertion, and mental fog. Predictors of persistent symptoms included provider-assessed moderate-severe illness, female sex, and middle age.
<a href="#">The impact of COVID-19 critical illness on new disability, functional outcomes and return to work at 6 months: a prospective cohort study</a> (Hodgson et al)	<i>Crit Care</i>	Study aimed to describe incidence of death or new disability, functional impairment and changes in health-related quality of life of patients after COVID-19 critical illness at 6 months. At six months after COVID-19 critical illness, death and new disability was substantial. Over a third of survivors had new disability, which was widespread across all areas of functioning.



<a href="#">Third dose vaccine With BNT162b2 and its response on Long COVID after Breakthrough infections</a> (Hoque et al)	<i>medRxiv</i>	Study investigates third dose vaccine with BNT162b2 and its response on Long COVID after breakthrough infections. All 20 participants in the study received both dosages of ChAdOx1-nCoV-19 between February 2021 to April 2021 and had breakthrough infections in same or following month which led to long COVID syndrome. They all received third dose of BNT162b2. A Wilcoxon matched paired signed-rank test revealed a significant reduction of inflammatory marker after receiving the 3rd vaccine dose. Pre and post 3rd dose quantitative anti-S1-RBD IgG response was measured and compared that revealed a significant boosting effect that clearly correlates with the CRP response.
<a href="#">Female gender is associated with "long COVID" syndrome: a prospective cohort study</a> (Bai et al)	<i>Clin Microbiol Infect</i>	Study explored association between female gender and "long COVID" syndrome, defined as persistence of physical and/or psychological symptoms for more than 4 weeks after recovery from acute COVID-19 disease. Female gender was independently associated with "long COVID" syndrome at multivariable analysis. Advanced age and active smoking also associated with higher risk of long COVID.
<a href="#">Evidence for impaired chronotropic responses to and recovery from 6-minute walk test in women with post-acute COVID-19 syndrome</a> (Baranauskas et al)	<i>Exp Physiol</i>	Study characterized heart rate responses to and recovery from a 6-minute walk test (6MWT) in women 3 months following mild-to-moderate COVID-19 compared to non-infected controls. Findings provide evidence for marked differences in chronotropic responses to and recovery from a 6MWT in women several months following acute COVID-19.
<a href="#">Long-term evolution of malnutrition and loss of muscle strength after covid-19: A major and neglected component of long covid-19</a> (Gérard et al)	<i>Nutrients</i>	Objective was to analyze persistent symptoms, nutritional status, evolution of muscle strength and performance status at 6 months post-discharge in cohort of COVID-19 survivors. 47% presented persistent malnutrition and significant decrease in muscle strength. Obese subjects as well as patients who have stayed in intensive care have a higher risk of functional loss or undernutrition.
<a href="#">Identifying Long-Term Effects of SARS-CoV-2 and Their Association with Social Determinants of Health in a Cohort of Over One Million COVID-19 Survivors</a> (Mukherjee et al)	<i>Research Square prepub</i>	Observational study analyzed large medical claims database of US based individuals to identify common long-term effects of COVID-19, as well as their associations with various social and medical risk factors. Among over 1.37 million COVID patients, the study found 36/1,724 3-digit ICD-10 codes to be statistically significantly increased in the post-COVID period. It also found one combination of ICD-10 codes, corresponding to 'other anemias' and 'hypertension' that was statistically significantly increased in post-COVID period. Age and gender significantly associated with multiple long-term effects. Race only associated with 'other sepsis', income only associated with 'Alopecia areata', while education level only associated with 'Maternal infectious and parasitic diseases'.
<a href="#">Association of post-COVID-19 fatigue with mental health problems and sociodemographic risk factors</a> (Uygur et al)	<i>Fatigue: Biomed Health Behav</i>	Objective was to obtain initial prevalence estimate of post-COVID-19 fatigue in Turkey and identify psychological and sociodemographic risk factors associated with post-COVID-19 fatigue. Significant fatigue was detected in 56% of participants. Female gender, history of psychiatric illness, history of psychiatric drug use, and current psychiatric drug use significantly higher in fatigued group than in non-fatigued group.
<a href="#">Post-Acute COVID-19 Outcomes In Children Requiring Hospitalisation</a> (Bossley et al)	<i>Research Square prepub</i>	Assessed for symptoms of post-acute COVID-19 syndrome after 4 weeks or more in cohort of children and young people admitted with COVID-19. Small number had symptoms which lasted more than 4 weeks, most of which resolved at 3 months. Symptoms included dry cough, fatigue and headache.
<a href="#">Long Covid after Breakthrough COVID-19: the post-acute sequelae of breakthrough COVID-19</a> (Al-Aly et al)	<i>Research Square prepub</i>	People with breakthrough COVID-19 exhibit lower risks of death and post-acute sequelae than people with COVID-19 who were not previously vaccinated for it; and in analyses among individuals who were hospitalized during acute phase of the disease, people with breakthrough COVID-19 exhibit higher risks of death and post-acute sequelae than people with seasonal influenza.
<a href="#">Burdens of post-acute sequelae of COVID-19 by severity of acute infection, demographics and health status</a> (Al-Aly et al)	<i>Nat Commun</i>	Study used healthcare databases of US Department of Veterans Affairs to build a cohort of 181,384 people with COVID-19 and 4 million non-infected controls and estimated burden of Post-Acute Sequelae of SARS-CoV-2 infection. Burden of PASC is substantial; PASC is non-monolithic with sequelae that are differentially expressed in various population groups.

<a href="#">Six-month sequelae of post-vaccination SARS-CoV-2 infection: a retrospective cohort study of 10,024 breakthrough infections</a> (Taquet et al)	medRxiv	COVID-19 vaccination is associated with lower risk of several, but not all, COVID-19 sequelae in those with breakthrough SARS-CoV-2 infection. Study found receiving at least one COVID-19 vaccine dose was associated with significantly lower risk of respiratory failure, ICU admission, intubation/ventilation, hypoxaemia, oxygen requirement, hypercoagulopathy/venous thromboembolism, seizures, psychotic disorder, and hair loss, but not other outcomes, including long-COVID features, renal disease, mood, anxiety, and sleep disorders. Receiving 2 vaccine doses was associated with lower risks for most outcomes. These benefits of vaccination were clear in younger people but not in over-60s. This may inform service planning and need for additional interventions for COVID-19 sequelae.
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## COMMENTARIES, LETTERS AND OPINION PIECES

- [Post-COVID syndrome: the aftershock of SARS-CoV-2 \(Int J Infect Dis\)](#): Focus of medical and research communities may need to start shifting focus from acute phase of COVID-19 to chronic manifestations of SARS-CoV-2 infection, “post-COVID syndrome”. As current studies suggest an involvement of immune-related dysfunction in development of post-COVID syndrome, immunosuppressive therapeutic options could be beneficial in parallel to heist SARS-CoV-2 vaccination of population.
- [Long COVID-19: A tangled web of lungs, heart, mind, and gender \(Trends Cardiovasc Med\)](#): Several of long COVID symptoms share similar characteristics with those of patients with mental illness including depression, fatigue, or generalized weakness, and depression by itself has long been associated with cardiovascular disease. Along with mental health related symptoms, long COVID-19 may ultimately represent a key substrate for increased risk of cardiovascular (CV) disease. Cardiac rehabilitation programs should be encouraged to mitigate mental health consequences of COVID-19 and to prevent deleterious effects on CV system. There is a need for proactive approach to follow-up affected patients with systematic assessment to include symptoms of mental and physical health and to promote healthcare programs to support healthier lifestyle and trained physical activity after COVID-19 infection.
- [Prise en charge des patients avec Covid long - illustration par des cas cliniques \(Rev Med Suisse\)](#): Les études actuelles, malgré leurs limites, leur hétérogénéité et leurs biais, montrent que la compréhension des facteurs favorisants, les explications physiopathologiques possibles ainsi que les recommandations internationales peuvent aider dans la prise en charge de ces patients en milieu ambulatoire. Une approche biopsychosociale et pluridisciplinaire en médecine générale est importante pour l'individu. Des études de qualité sont nécessaires avec l'objectif d'améliorer la prise en charge de patients avec Covid long.

## MEDIA HIGHLIGHTS

### CANADA

- [University of Manitoba team receives \\$202,000 grant to study 'long COVID'](#): *Global News* reported that through CIHR researchers at the University of Manitoba have received a \$202,000 grant to study “long-haul COVID.” The team wants to understand what proportion of people who had COVID-19 end up with “long COVID,” who is most likely to be affected, and what symptoms people are experiencing. Manitoba is in a unique position to be able to study these research questions due to an anonymized database (Manitoba Population Research Database) which includes information on every single Manitoban who has contact with the health-care system.
- [Let my long haul COVID symptoms be a reason for others to get vaccinated](#): *CBC News* highlighted some provinces have specialized post-COVID clinics to treat patients but Saskatchewan has not set up a clinic yet to solely address long-term symptoms of COVID-19.
- [For COVID-19 'long-haulers,' the new normal will be wildly different](#): *CBC News* highlighted long COVID advice from a physiotherapist and social worker. A physiotherapist who specializes in recovery for those with long-term respiratory and cardiac conditions, advises people with long-term COVID symptoms to write everything down to understand their symptoms. A social worker noted that public health officials and medical professionals are more focused on immediate responses like vaccinations and hospitalizations, so few services or resources are currently out there for long-haulers. There needs to be more medical and counselling supports targeted to this group.

### GLOBAL

- [50 percent of people who survive covid-19 face lingering symptoms, study finds](#): *Washington Post* highlighted at least 50% of people who survive covid-19 experience a variety of physical and psychological health issues for six months or more after their initial recovery, according to [research](#) on the long-term effects of the disease.
- [Public health leaders hope stories about long Covid will motivate more young people to get vaccinated](#): *CNN* reported younger people are among some of the least-vaccinated people in the US. Telling people about the potential long-term consequences of Covid-19 may be the exact motivation they need to get protected.
- [Long COVID may affect response to and recovery from exercise in women](#): *Medical News Today* noted that women presenting with specific long COVID symptoms, namely shortness of breath or joint or muscle aches, were also more limited in their ability to do a walking test than people who had had a SARS-CoV-2 infection but experienced no lingering symptoms.

## POST COVID-19 CONDITION ADVOCACY AND SUPPORT GROUPS

- [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. They also have a COVID long-haulers [support group](#) and [Report on Pan-Canadian Long COVID Impact Survey \(PDF\) \(June 2021\)](#)
- [BC ECHO for Post-COVID-19 Recovery \(Canada\)](#): Based on the [global ECHO model](#), the BC ECHO for Post-COVID-19 Recovery is a virtual learning community of specialists and community health-care providers who use instructive and case-based learning to improve care for patients 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 interim [report](#) outlines recommendations for federal policymakers to help 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.

### NEWLY ADDED RESOURCES:

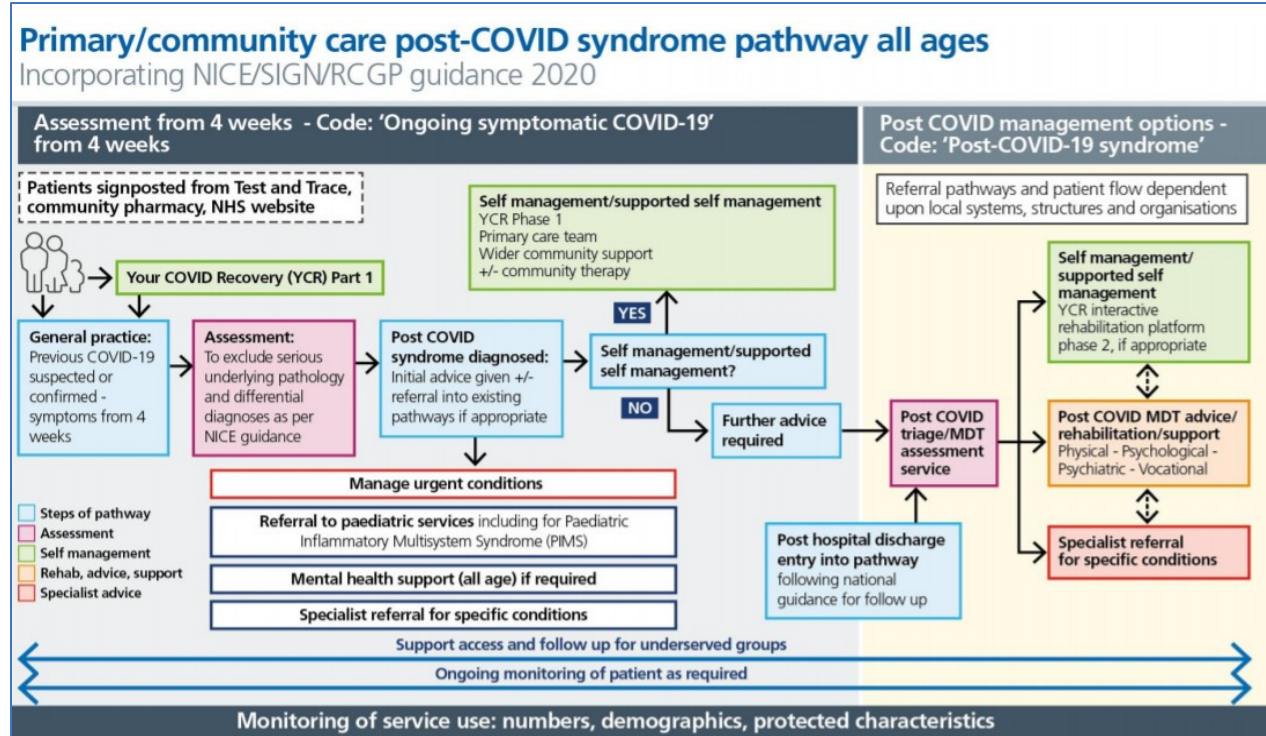
- [Living with Long COVID \(US\)](#): COVID-19 Long-Haulers and Post-COVID Support Community.



## APPENDIX

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

**Figure 1. NICE/SIGN/RCGP 2020 Guidance**



Source: National Health Service (NHS). National [guidance](#) for post-COVID syndrome assessment clinics, Version 2, 26 April 2021.

**Figure 2. CIHR COVID-19 Rapid Research Funding Opportunity**

Over 10 projects directly examining long-term implications of SARS-CoV-2 infection

- Other large funded networks/projects may also be able to examine long-term impacts

Cohort Studies	Clinical Management & Rehabilitation	Long-term Impact on Organ Systems	Predictive Markers
<ul style="list-style-type: none"> <li>Capture data &amp; biologics to enable <b>population-level surveillance</b></li> <li><b>Up to 1 year</b> of follow-up (CanCOV)</li> <li>Patients with <b>suspected or confirmed COVID-19</b> (Emergency Department Rapid Response Network)</li> <li>Use of <b>AI technologies</b> to track outcomes (CovidFree@home)</li> <li><b>Pregnancy cohorts</b> to understand impact on <b>mother &amp; infant health</b> (CHILD; COPE)</li> </ul>	<ul style="list-style-type: none"> <li>Study the <b>functional recovery</b> &amp; need for <b>targeted rehabilitative treatments</b></li> <li>Large platform (COREG) to collect <b>outpatient case data for up to 9 months</b> (collaboration with WHO)</li> </ul>	<ul style="list-style-type: none"> <li>Imaging systems to determine impact on <b>lungs &amp; other organs</b> (MOIST)</li> <li>Imaging systems to examine <b>neuroinflammation</b> &amp; associated development of <b>mental illnesses</b></li> <li>Measure impact on <b>cognitive function, brain structure, and brain function</b> in elderly (CLSA)</li> </ul>	<ul style="list-style-type: none"> <li>Link <b>serological, genomic and patient characteristics</b> to long-term disease outcomes</li> </ul>

Source: CIHR Knowledge Mobilization Forum. June 10, 2021

**Figure 3. CIHR Funded Operating Grant: Emerging COVID-19 Research Gaps & Priorities - Post COVID-19 condition (Select Studies)**

Name	Institution Paid	Project Title	CIHR Funding Contribution	Funding Term
Gershon, Andrea S; Aaron, Shawn D; Gupta, Samir; Lavoie, Kim; Leung, Janice; Sin, Donald; Stickland, Michael K; To, Teresa	Sunnybrook Research Institute (Toronto, Ontario)	The Canadian Respiratory Research Network Long COVID-19 Study	\$500,000	1 year
Raj, Satish R	University of Calgary	Muticentre Assessment of Cardiovascular Hemodynamics and Autonomic Dysfunction with Long COVID	\$277,613	1 year
Sander, Beate H; Janjua, Naveed Z; Kwong, Jeffrey C; Mishra, Sharmistha; Sbihi, Hind	University Health Network (Toronto)	Predictors and burden of post-acute COVID-19 syndrome (long-COVID) with a focus on equity	\$499,645	1 year
Weatherald, Jason; Granton, John T; Mak, Susanna	University of Calgary	Pulmonary vascular disease in patients with Long COVID	\$292,092	1 year
Archambault, Patrick; Berger Pelletier, Elyse; Graves, Donna Lorraine; McGavin, Colleen B; Dainty, Katie N; Hohl, Corinne M; Perry, Jeffrey J; Rosychuk, Rhonda J	Université Laval	Investigating the Post-Acute Sequelae of SARS-CoV-2 Infections: a Patient Oriented Canadian COVID-19 Emergency Department Rapid Response Network (CCEDRRN) Study	\$499,945	1 year
Corbeil, Jacques; Lambert, Jean-Philippe	Université Laval	COVID-19 persistent symptomatology: an investigation of the metabolomic and proteomic underpinning	\$394,000	1 year
Nacul, Luis; Levin, Adeera; McKay, Rhonda J; Song, Xiaowei	University of British Columbia	A double blind randomized trial of low-dose naltrexone for post-covid fatigue syndrome	\$742,331	1 year
Leong, Darryl	McMaster University	Post-Acute Complications of COVID-19: An International Cohort Study (PACS) Note in a previous iteration, proposal was titled PACMAN as indicated in some Letters of Support	\$495,684	1 year
Law, Susan K	Trillium Health Partners (Mississauga, ON)	Living with long-COVID. Patient experience to inform policy makers and care providers	\$275,969	1 year
Hatcher, Simon; Orpana, Heather M; Werier, Joel M	Ottawa Hospital Research Institute	In people with Long Covid does adding a digital health platform to usual care improve outcomes at three months compared to usual care alone? The Enhancing Covid Rehabilitation with Technology (ECORT) randomised controlled trial	\$922,869	1 year
Mukherjee, Manali; Svenningsen, Sarah; Tselios, Konstantinos	McMaster University	SARS-CoV-2 triggers Autoimmunity: implications for the pathogenesis of Post-Acute COVID-19 Syndrome - (AI-PACS)	\$0 CIHR External Partner (PHAC) Contribution-\$499,245	1 year
Cheung, Angela M; Järn, Peter; Tomlinson, George A	University Health Network (Toronto)	The RECLAIM (REcovering from COVID-19 Lingering symptoms Adaptive Integrative Medicine) trial	\$1,000,000	1 year
Ramanathan, Sheela; Piche, Alain	Université de Sherbrooke	Clinicopathological correlates of long COVID and potential interventions for improving the quality of life	\$490,000	1 year
Ho, Chester; O'Connell, Petra; Zilkie, Tracey A	University of Alberta	Implementing the Provincial Post COVID-19 Rehabilitation Framework for Screening & Transitions in Alberta: A Pragmatic Evaluation	\$499,883	1 year
Baker, Andrew J; Dos Santos, Claudia C	Unity Health Toronto	Autoimmunity as a novel mechanism in post-COVID syndrome	\$0 CIHR External Partner (PHAC) Contribution-\$269,500	1 year
Gross, Douglas P; Lam, Grace Y; Skolnik, Kate; Weatherald, Jason	University of Alberta	Exploring Rehabilitation Needs and Access to Services for Long COVID	\$152,778	1 year

Yeung, Rae S; Benseler, Susanne; Haddad, Elie	Hospital for Sick Children (Toronto)	Post COVID hyperinflammation: A syndrome beyond the name	\$0 CIHR  External Partner (PHAC) Contribution- \$499,170	1 year
Pasquier, Jean Charles; Beaulieu, Jean-François; Chaillet, Nils; Laforest-Lapointe, Isabelle; Piche, Alain; Robitaille, Julie	Université de Sherbrooke	Évaluation de l'efficacité des probiotiques sur les affections post-COVID-19.	\$997,273	1 year
Swayne, Leigh A; Tremblay, Marie-Ève	University of Victoria (British Columbia)	Understanding and treating the adverse effects of COVID-19 on the brain	\$293,000	1 year
Kendall, Claire; Hawken, Steven; Tanuseputro, Peter	Bruyère Research Institute	Health equity and the post COVID-19 condition	\$221,728	1 year
Green, Robin E; Cheung, Angela M	University Health Network (Toronto)	An intervention to teach self-management skills for persisting symptoms of COVID-19: Minimizing impact of symptoms on everyday functioning and on healthcare usage/utilization - A randomized controlled trial	\$330,562	1 year
Falcone, Emilia L	Institut de recherches cliniques de Montréal	Identification of microbial factors to modulate immune dysregulation and treat post-COVID-19 syndrome.	\$0 CIHR  External Partner (PHAC) Contribution- \$493,955	1 year
Quinn, Kieran L; Chan, Timothy; Cheung, Angela M; Ghassemi, Marzyeh; Herridge, Margaret S; Mamdani, Muhammad; Razak, Fahad; Rosella, Laura C; Verma, Amol	Sinai Health System (Toronto)	Improving the recognition and care of patients with long-term health complications of COVID-19	\$499,998	1 year
O'Brien, Kelly K; Brown, Darren A; Bergin, Colm J; Erlandson, Kristine M; Vera, Jaime	University of Toronto	Long COVID and Episodic Disability: Advancing the Conceptualization, Measurement and Knowledge of Episodic Disability with people living with Long COVID	\$204,205	1 year
Roy, Jean-Sébastien; Paquette, Jean-Sébastien; Perreault, Kadja	Université Laval	Better understanding physical and cognitive impairments and functional limitations in people suffering from long COVID to support the development of adapted interventions	\$293,100	1 year
Sin, Donald	University of British Columbia	Biomarker Discovery for the Post-COVID Pulmonary Syndrome	\$499,500	1 year
Beauchamp, Marla K; Costa, Andrew P; Duong, Mylinh; Ho, Terence; Kruisselbrink, Rebecca; Raina, Parminder S	McMaster University	The McMaster Multi-Regional Hospital Coronavirus Registry (COREG): Extending a Rapid Research Platform to Inform the Clinical Management of COVID-19 'long haulers'	\$497,800	1 year
Paterson, Theone; Gicas, Kristina M	University of Victoria (British Columbia)	Investigating Neuropsychological Consequences of COVID-19 on Adults, and Examination of Associated Risk and Resilience Factors	\$199,121	1 year
Graff-Guerrero, Ariel; Gerretsen, Philip	Centre for Addiction and Mental Health (Toronto)	Long COVID-19 on the human brain	\$932,475	1 year
Graham, Simon J; Chen, Jing J; Gilboa, Asaf; MacIntosh, Bradley J; Schweizer, Tom A; Sekuler, Allison B	Sunnybrook Research Institute (Toronto, Ontario)	Post-Acute Sequelae of COVID-19: An Electroencephalography and Magnetic Resonance Neuroimaging Study of the Elderly in our Communities	\$500,000	1 year