

POST COVID-19 CONDITION
OCSO BIWEEKLY SCAN OF EVIDENCE #10
Oct 23 - Nov 5th, 2021

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 an updated living [systematic review](#) by PHAC on the prevalence of long-term effects in individuals diagnosed with COVID-19, as well as a [systematic review](#) on recommendations for returning athletes who have experienced long term COVID-19 symptoms.

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](#).
- Rapid [guidelines](#) for healthcare professionals were published in UK **NICE** in December 2020 (*Figure 1, Appendix*).
- 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).



Source: [European Observatory on Health Systems and Policies](#): In the wake of the pandemic: preparing for Long COVID (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: [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.
 - **(NEW)** 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 7th, 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, & BC 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).

USA

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.
- **(NEW)** [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.

EMERGING SCIENTIFIC EVIDENCE

EVIDENCE PRODUCTS (OCT 23-NOV 5, 2021)

TITLE	EVIDENCE TYPE	SUMMARY
Multisystemic long-term sequelae of covid-19: A review based on the current literature over a year of pandemic experience (Sahin et al)	Review (Available in <i>Eurasian J Med Oncol</i>)	This review aims to examine current literature regarding COVID-19, identify post-illness sequelae, detect patients at risk for sequelae, and provide guidance to management strategies. Long-term pulmonary sequels and systemic problems of COVID-19 are discussed in accordance with recent scientific publications.
Long COVID and Post-infective Fatigue Syndrome: A Review (Sandler et al)	Review (Available in <i>Open Forum Infect Dis</i>)	Fatigue is a dominant feature of both acute and convalescent COVID-19, with up to 46% of patients reporting fatigue that lasts from weeks to months. Investigators of the international Collaborative on Fatigue Following Infection (COFFI) conducted a systematic review of post-COVID fatigue and a narrative

		review on fatigue after other infections, and made recommendations for clinical and research approaches to assessing fatigue after COVID-19. To better characterize post-COVID fatigue, the COFFI investigators recommend: application of validated screening questionnaires for case detection; standardized interviews encompassing fatigue, mood, and other symptoms; and investigative approaches to identify end-organ damage and mental health conditions.
What are the recommendations for returning athletes who have experienced long term COVID-19 symptoms (Lindsay et al)	Systematic Review (Available in <i>Ann Med</i>)	Aim of systematic review is to synthesise recommendations for returning athletes who experienced long COVID symptoms. Further research, including longitudinal research of athletes who tested positive for COVID-19, is required to develop evidenced-based guidelines for athletes with ongoing COVID-19 symptoms. Prior to returning to play after COVID-19, a medical history, physical and psychological examination should be conducted by medical professional. Athletes should continue to monitor and record physical and psychological markers of health.
Prevalence of long-term effects in individuals diagnosed with COVID-19: an updated living systematic review (Reyes Domingo et al)	Systematic Review (Available in <i>medRxiv</i>)	Objective of living systematic review is to summarize prevalence of symptoms and sequelae reported by people ≥ 4 weeks after COVID-19 diagnosis. Over 100 post COVID-19 symptoms and sequelae were reported. 61% and 53% of laboratory-confirmed individuals reported persistence or presence of one or more symptoms in the short- and long-term periods, respectively. Most prevalent symptoms in both periods included: fatigue, general pain or discomfort, shortness of breath, cognitive impairment and mental health symptoms. A substantial proportion of individuals reported a variety of symptoms ≥ 4 weeks after COVID-19 diagnosis. Due to gaps in research base, and low certainty of evidence available, further research needed to determine true burden of post COVID-19 condition in general population and in specific subgroups.

SELECT PRIMARY RESEARCH (OCT 23-NOV 5, 2021)

TITLE	SOURCE	SUMMARY
Long COVID syndrome-associated brain fog (Asadi-Pooya et al)	<i>J Med Virol</i>	Study investigated frequency of brain fog in large cohort of patients with COVID-19 who have survived the illness. They scrutinized potential risk factors associated with development of brain fog. 2696 patients had the inclusion criteria; 62.3% people reported long COVID syndrome (LCS). LCS-associated brain fog was reported by 7.2% patients.
Retrospective diagnosis of SARS-CoV-2 infection in patients with Long COVID by measuring specific T cell mediated IL-2 release (Krishna et al)	<i>Research Square Prepub</i>	Study designed a SARS-CoV-2 specific T cell assay to follow up a cohort of undifferentiated, mostly non-hospitalized patients with long COVID for up to 13 months. IL-2 release from SARS-CoV-2-specific memory T cells shows >75% sensitivity and >88% specificity in identifying individuals with confirmed SARS-CoV-2 infection > six months after a positive PCR test.
Post COVID-19 sequelae: A prospective observational study from Northern India (Naik et al)	<i>Drug Discov Ther</i>	Aim of study was to describe clinical features and risk factors of post COVID-19 sequelae in North Indian population. Long COVID symptoms were common (22%), and 9.9% had post COVID-19 syndrome. Myalgias, fatigue and dyspnoea were common symptoms. Patients with hypothyroidism and hypoxia during acute illness were at higher risk of long COVID.
Persistence of sleep disturbance among post-COVID patients: Findings from a 2-month follow-up study in a Bangladeshi cohort (Islam et al)	<i>J Med Virol</i>	Aim was to evaluate persistence and factors associated with sleep disturbances among COVID-19 patients with history of sleep disturbances 2 months after discharge from hospital. 35% of study participants were still experiencing symptoms of sleep disturbances. Age and diabetes mellitus were independently associated with sleep disturbances among participants.
Post COVID-19 in children, adolescents, and adults: results of a matched cohort study including more than 150,000 individuals with COVID-19 (Roessler et al)	<i>medRxiv</i>	Utilizing comprehensive healthcare data on over 45% of the German population, researchers investigated post COVID-19 in children/adolescents and adults. COVID-19 and control cohorts were followed for incident morbidity outcomes documented at least 3 months after date of COVID-19 diagnosis. Results showed specific outcomes with highest IRR and an incidence rate of at least 1/100 person-years in COVID-19 cohort in children and adolescents were malaise/ fatigue/ exhaustion, cough, and throat/chest pain.

Symptoms compatible with long-COVID in healthcare workers with and without SARS-CoV-2 infection – results of a prospective multicenter cohort (Strahm et al)	<i>medRxiv</i>	Study assessed frequency and risk factors for symptoms compatible with long-COVID in cohort of healthcare workers (HCW). Of 3'334 HCW, 17% had a positive NPS and 7% were seropositive. HCW with positive NPS more frequently reported ≥1 symptom compared to controls. Acute viral symptoms in weekly questionnaires best predicted long-COVID symptoms. Physical activity at baseline was negatively associated with neurocognitive impairment and fatigue scores.
Long-Term Effects of COVID-19 on Health Care Workers 1-Year Post-Discharge in Wuhan (Liao et al)	<i>Infect Dis Ther</i>	Study assessed long-term consequences of COVID-19 among health care workers (HCWs) in China. Most surviving HCWs, especially female HCWs, still had abnormal diffusion capacity at 1 year. Physical and psychiatric functions of surviving HCWs were significantly worse than those of the healthy population.
COVCOG 1: Factors predicting Cognitive Symptoms in Long COVID. A First Publication from the COVID and Cognition Study (Guo et al)	<i>medRxiv</i>	The COVID and Cognition Study is a part cross-sectional, part longitudinal, study aiming to understand cognitive problems in long COVID. In this paper, we document characteristics of sample of 181 individuals who had COVID-19 infection, and 185 who had not. Severity of initial illness is significant predictor of presence and severity of ongoing symptoms. Some symptoms during acute illness, particularly limb weakness, may be more common in those with more severe ongoing symptoms. We found neurological and fatigue symptoms during initial illness, and neurological and cardiopulmonary symptoms during ongoing illness, predicted experience of cognitive symptoms.
COVCOG 2: Cognitive and Memory Deficits in Long COVID: A Second Publication from the COVID and Cognition Study (Guo et al)	<i>medRxiv</i>	This paper explored characteristics of a sample of individuals who suffered COVID-19 infection to assess tests of memory, language and executive function. We found consistent pattern of memory deficits in those that had COVID-19 infection, with deficit increasing with severity of self-reported ongoing symptoms. Fatigue/systemic symptoms during initial illness and ongoing neurological symptoms were predictive of cognitive performance.
Patient symptoms and experience following COVID-19: results from a UK-wide survey (Buttery et al)	<i>BMJ Open Respir Res</i>	Mixed-methods analysis aims to investigate experience of people who continue to be unwell after acute COVID-19 ('long COVID'), both in terms of symptoms and interactions with healthcare in UK. Symptoms did not appear to be related to severity of acute illness or to presence of pre-existing medical conditions. Analysis of responses revealed 3 themes: (1) experience of living with COVID-19: physical and psychological symptoms that fluctuate unpredictably; (2) interactions with healthcare that were unsatisfactory; (3) implications for future: their own condition, society and healthcare system, and need for research
Systemic corticosteroids for management of 'long-COVID': an evaluation after 3 months of treatment (Goel et al)	<i>Monaldi Arch Chest Dis</i>	During the study duration, out of the 4,542 patients managed in outpatient department of unit, there were 49 patients of Long-COVID. We retrospectively analysed clinical and radiological findings of patients at first presentation and at about 3 months of follow up visit. Occurrence of breathlessness decreased from 91.83% to 44.89% and cough from 77.55% to 8.16%. 24 patients were prescribed systemic steroids. Majority of patients who were tachypnoeic and hypoxic at rest showed improvement post-treatment with corticosteroids.

COMMENTARIES, LETTERS AND OPINION PIECES

- [Long COVID risk - a signal to address sex hormones and women's health \(Lancet\)](#): Vulnerability to and mortality from acute COVID-19 infection is higher in men, whereas, long COVID disproportionately affects women. Many symptoms of long COVID have a significant overlap with the perimenopause and menopause, both which can affect women of all ages. There is urgent need for robust research to help understand the epidemiological basis, as well as the underlying biological mechanisms for sex-differences in Long COVID.
- [Recommendations for the recognition, diagnosis, and management of long COVID - a Delphi study \(Br J Gen Pract\)](#): A Delphi study was conducted with a panel of primary and secondary care doctors. Recommendations were generated relating to the investigation and management of long COVID. GPs should consider long COVID in the presence of a wide range of presenting features and exclude differential diagnoses where appropriate. Long COVID clinics should operate as part of an integrated care system, with GPs playing a key role in the multidisciplinary team. Holistic care pathways, investigation of specific complications, management of potential symptom clusters, and tailored rehabilitation are needed.

MEDIA HIGHLIGHTS

CANADA

- [‘Is this my life forever?’ The unexpected — and frightening — impact of Long COVID on young Canadians](#): *Toronto Star* reports on the stories of long haulers and notes symptoms such as sensitivity to light and sound, a distorted sense of taste and unexplained allergic reactions. It's believed about 10% of people infected with COVID-19 will have persistent effects 12 months later.
- [McMaster researchers study the causes of ‘Long COVID’](#): *CHCH* reports scientists at McMaster University are conducting research on the long-term effects patients suffered from after they recovered from COVID-19. The Government of Canada is investing \$500,000 in this study. The funding will allow scientists to understand if COVID-19 triggers immune responses that cause chronic symptoms and potentially increase the risk of future diseases like lupus. The team will track 120 patients with long-haul symptoms.
- [COVID-19: Some patients still suffering 18 months after first diagnosis](#): *Vancouver Sun* highlighted that as soon as the Post-COVID-19 Recovery Clinic in Surrey was up and running, patients in their 30s and 40s were complaining of draining effects from the disease. The clinic has gone from being open part-time and seeing about 8 patients a week when it launched in January, to being open 5 days a week, being pre-booked up, seeing new patients, following up for 18 months. Between the 4 clinics, more than 2,500 patients with ongoing long-COVID symptoms have been seen. Some of the information and treatment strategies around long-COVID symptoms is gleaned from experiences with other viruses including SARS and MERS.

GLOBAL

- [How Covid attacks the brain may explain long-lasting symptoms](#): *NBC News* reports on some new research that may shed light on why some people experience ongoing neurological symptoms, such as brain fog.
- [UK launches trial of drug to tackle fatigue in long Covid patients](#): *The Guardian* reported the first trial of a drug to target the fatigue and muscle weakness experienced by more than half of people with long Covid has been launched in the UK. It is also the first drug trial in long Covid patients who were not hospitalised during their initial infection.
- [Long Covid: what are you entitled to if you can't work in the UK?](#): *The Guardian* notes 1m Britons report symptoms and many are unable to work – but there are benefits and arrangements in place. Those with long-term health conditions as a result of long Covid can also apply for Pip if they have had daily living or mobility needs for three months and are expected to have needs for at least a further 9 months.

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 \(CPRA\) \(USA\)](#): 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.

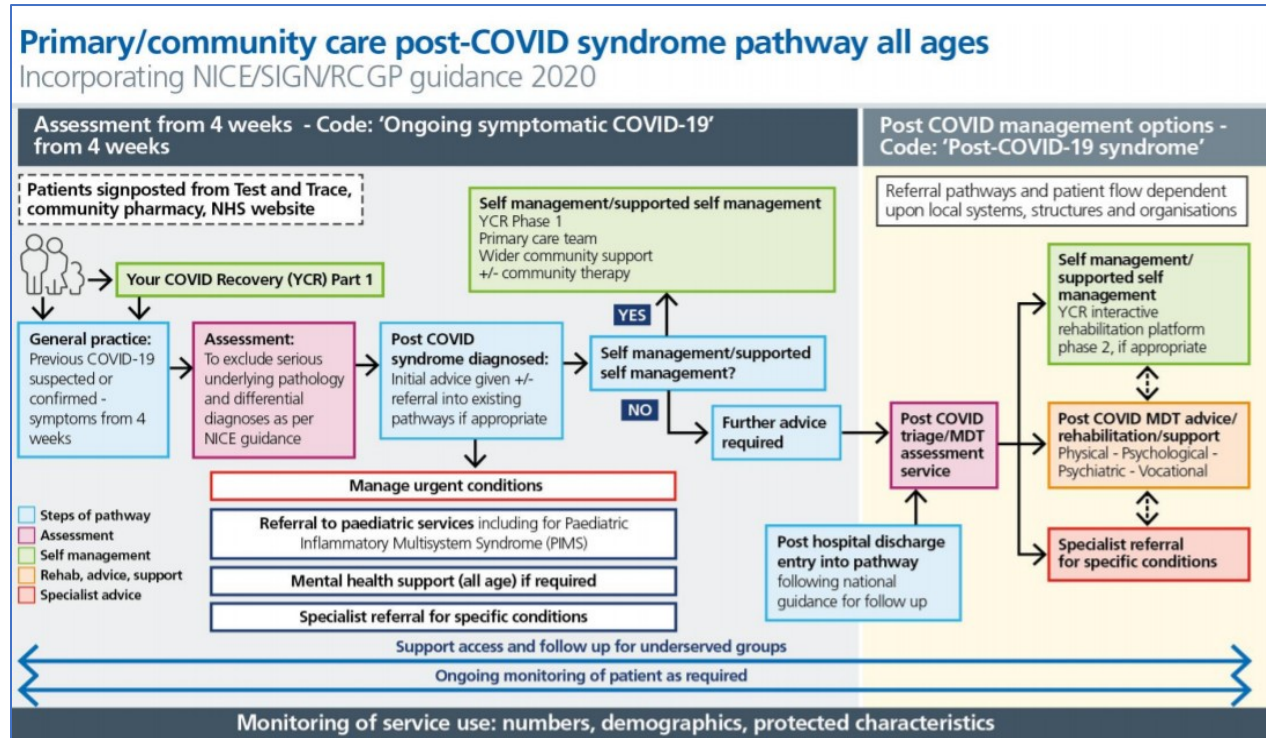
NEWLY ADDED RESOURCES:

- [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.

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

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; Järnå, 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, Kadija	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