POST COVID-19 CONDITION

OCSO SCAN OF EVIDENCE #14

Dec 16, 2021- Jan 14, 2022

SCOPE

This 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. 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 month's scan includes a report by Brookings Institution examining the impact of long COVID on the labour shortage, a scoping review on the symptoms and management of long COVID, as well as new guidance on long COVID from the Royal Australian College of General Practitioners.

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.*"
    - (NEW) 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.

- (NEW) Royal Australian College of General Practitioners (RACGP) guidance for GPs caring for 'long COVID' patients.

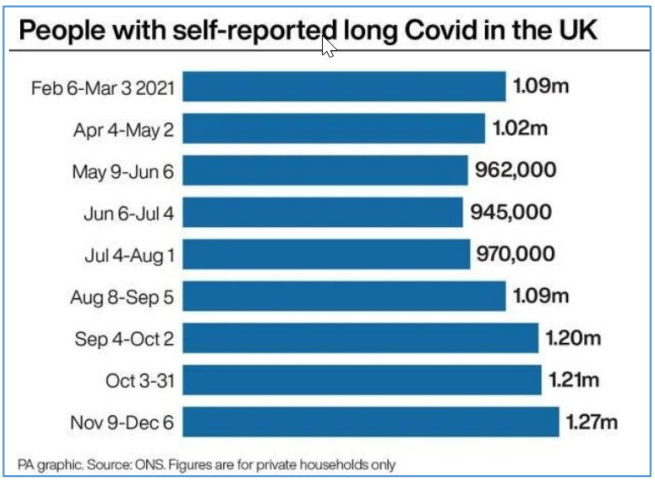
NATIONAL AND INTERNATIONAL DEVELOPMENTS (*DEC 16, 2021-JAN 14, 2022*)

CANADA

- (NEW) Due to changes in B.C.'s COVID-19 testing guidelines, the Post-COVID-19 Interdisciplinary Clinical Care Network (PC-ICCN) will be reviewing eligibility requirements for Post-COVID Clinics to ensure continued equitable access to care for patients who continue to experience symptoms longer than 3 months.
- (NEW) Alberta Health Services estimates 68,200 have or will develop long-COVID.

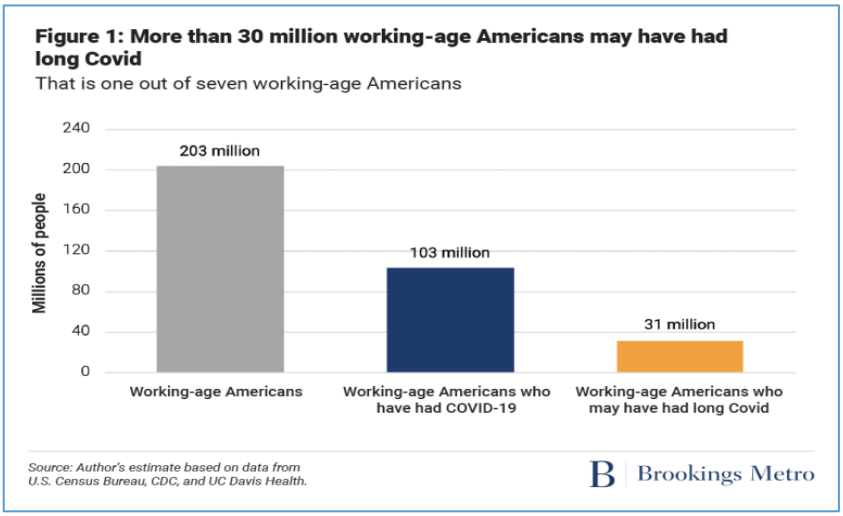
UK

- (NEW) UK Parliament: Rapid Response article on long COVID.
- (NEW) One in 50 people in UK experiencing long Covid, survey suggests. Fatigue is the most common symptom affecting people with the condition, followed by loss of smell. The figures, from the Office for National Statistics (ONS), are based on self-reported long Covid from a representative sample of people in private households. Responses were collected in the four weeks to December 6 – before the recent surge in coronavirus infections driven by Omicron.
- (NEW) Support resources on long COVID posted by the UK Department of Health and Social Care.



US

- (NEW) Long-haul symptoms from COVID-19 infection are still possible even for people who contract a milder case of the omicron variant, Dr. Anthony Fauci said in an interview with Spectrum News on Wednesday.
- (NEW) Funding Opportunity by the Department of Health and Human Services (Centers for Disease Control – NCIRD): Tracking the burden, distribution, and impact of Post COVID-19 conditions in diverse populations for children, adolescents, and adults (Track PCC) – **45 million.**
- (NEW) Report by U.S. based Brookings Institution examining whether long COVID is worsening the labour shortage.



EMERGING SCIENTIFIC EVIDENCE (*DEC 16, 2021-JAN 14, 2022*)

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
A clinical case definition of post-COVID-19 condition by a Delphi consensus (Soriano et al)	Review (Available in *Lancet Infect Dis*)	The absence of a globally standardised and agreed-upon definition hampers progress in characterisation of its epidemiology and the development of candidate treatments. In a WHO-led Delphi process, we engaged with an international panel of 265 patients, clinicians, researchers, and WHO staff to develop a consensus definition for this condition. 14 domains and 45 items were evaluated in two rounds of the Delphi process to create a final consensus definition for adults: post-COVID-19 condition occurs in individuals with a history of probable or confirmed SARS-CoV-2 infection, usually 3 months from the onset, with symptoms that last for at least 2 months and cannot be explained by an alternative diagnosis. Although the consensus definition is likely to change as knowledge increases, this common framework provides a foundation for ongoing and future studies of epidemiology, risk factors, clinical characteristics, and therapy.
Symptoms and management of long COVID: A scoping review (Cha et al)	Scoping Review (Available in *J Clin Nurs*)	Conducted a literature search to retrieve articles published from May 2020 to March 2021. Among 1880 articles retrieved, 34 articles met or criteria for review: 21 related to symptom presentation and 13 to management of long COVID. Long COVID symptoms were described in 21 articles. Following COVID-19 treatment, hospitalised patients most frequently reported dyspnoea, followed by anosmia/ageusia, fatigue and cough, while non-hospitalised patients commonly reported cough, followed by fever and myalgia/arthralgia. 13 studies described management for long COVID: Focused on a multidisciplinary approach in 7 articles, pulmonary rehabilitation in 3 articles, fatigue management in 2 articles and psychological therapy in 1 study.
Analysis of post COVID-19 condition and its overlap with myalgic encephalomyelitis/ chronic fatigue syndrome (Sukocheva et al)	Review (Available in *J Adv Res)*	COVID-19 triggers development of numerous pathologies and infection-linked complications and exacerbates existing pathologies in nearly all body systems. Adverse SARS-CoV-2 effects were observed in nervous, cardiovascular, gastrointestinal/metabolic, immune, and other systems in COVID-19 survivors. Long-term effects of this infection have been recently observed and represent distressing sequelae recognised by WHO as post-COVID-19 condition. Considering the pandemic is still ongoing, more time is required to confirm post COVID-19 condition diagnosis in the COVID-19 infected cohorts, although many reported post COVID-19 symptoms overlap with myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS).

SELECT PRIMARY RESEARCH

TITLE AND AUTHOR	SOURCE	SUMMARY
Study of Prevalence and Characteristics of Long Covid in Spanish Children (Bergia et al)	*Research Square prepub*	Objective was to know prevalence of prolonged symptoms in children with confirmed SARS-CoV-2 infection, and to describe their clinical characteristics and possible risk factors. 82% presented mild outpatient infection, and 5.1% required admission in PICU. Mean age was 5.9 years old. Control group of 98 children included. In 14.6% cases at least one symptom lasted longer than 12 weeks. Insomnia, concentration problems, apathy or sadness and anxiety were the longest. Age above 5 years; admission, the need for PICU, and to have a relative with prolonged symptoms were significantly associated with Long-COVID. When comparing with controls age above 5 years old, myalgia, asthenia, and loss of appetite were significantly associated with Long-COVID.

Clinical characteristics with inflammation profiling of Long-COVID and association with one-year recovery following hospitalisation in the UK: a prospective observational study (Evans et al)	*medRxiv*	PHOSP-COVID is a prospective longitudinal cohort study, recruiting adults hospitalised with COVID-19 across the UK. 2320 participants have been assessed at 5 months after discharge and 807 participants have completed both five-month and one-year visits. Proportion of patients reporting full recovery was unchanged between five months (25.6%) and one year (28.9%). Factors associated with being less likely to report full recovery at one year were: female sex, obesity and IMV.
Cognitive sequelae of long COVID may not be permanent. A prospective study (Del Brutto et al)	*Eur J Neurol*	Study aimed to assess whether COVID-19-related cognitive decline is a permanent deficit or if it improves over time. Study participants had 4 cognitive evaluations, 2 before the pandemic and the other two, 6 and 18 months after initial SARS-CoV-2 outbreak infection in village. 6 months after infection, only COVID-19 survivors had significant decline in MoCA scores, which reversed after one additional year of follow-up.
Characterizing the COVID-19 Illness Experience to Inform the Study of Post-acute Sequelae and Recovery (Santiago-Rodriguez et al)	*Int J Behav Med*	We characterized variability in acute illness experience and ongoing recovery process from participants in a COVID-19 recovery cohort study in Northern California in 2020. After integrating thematic analysis with clinical data, identified 3 key themes: (1) across symptom profiles and severity, experiencing COVID-19 was associated with psychological distress; (2) symptomatic infection carried uncertainty in symptom presentation and ongoing recovery (e.g., long COVID); and (3) health information-seeking behavior was facilitated by access to medical care and uncertainty with the recovery process.
Assessing the acceptability of a co-produced long COVID intervention in an underserved community in the UK (Fowler-davis et al)	*Int J Environ*	Aim of project was to co-produce an acceptable intervention for people with Long COVID living in communities recognised as more deprived in the UK. The online intervention was based on a multi-disciplinary team using approaches from sport and exercise medicine and functional rehabilitation. 8 participants completed intervention, and their needs were commonly associated with fatigue, anxiety and depression.
Association between vaccination status and reported incidence of post-acute COVID-19 symptoms in Israel: a cross-sectional study of patients infected between March 2020 and November 2021 (Kuodi et al)	*medRxiv*	We determined whether vaccination was associated with reporting long-term symptoms post-SARS-CoV-2 infection by comparing, among individuals previously infected with SARS-CoV-2, those who were vaccinated to those who were not, in terms of self-reported long-term symptoms. After adjusting for follow-up time and baseline symptoms, fully vaccinated (2 or more doses) individuals were less likely than unvaccinated individuals to report fatigue, headache, weakness, and persistent muscle pain by 64%, 54%, 57%, and 68% respectively.
Effect of SARS-CoV-2 Vaccination on Symptoms from Post-Acute Sequelae of COVID-19: Results from the Nationwide VAXILONG Study (Scherlinger et al)	*Vaccines*	We conducted a nationwide online study among adult patients with PASC as defined by symptoms persisting over 4 weeks following a confirmed or probable COVID-19, without any identified alternative diagnosis. Information concerning PASC symptoms, vaccine type and scheme and its effect on PASC symptoms were studied. The initial infection was proven in 365 patients (64%) and 5.1% had been hospitalized to receive oxygen. 396 patients had received at least one injection of SARS-CoV-2 vaccine at time of survey. Among 380 patients who reported persistent symptoms at time of vaccination, 201 (52.8%) reported a global effect on symptoms following the injection, corresponding to an improvement in 21.8% and a worsening in 31%. No differences based on type of vaccine used. After complete vaccination, 93.3% (28/30) of initially seronegative patients reported a positive anti-SARS-CoV-2 IgG. A total of 170 PASC patients hadn't been vaccinated. Most common reasons for postponing vaccine were fear of worsening PASC symptoms (55.9%) and belief that vaccination was contraindicated because of PASC (15.6%).
Prevalence, characteristics, and predictors of Long COVID among diagnosed cases of COVID-19 (Arjun et al)	*medRxiv*	Study estimated prevalence and identified characteristics and predictors of long COVID among patients. Long COVID was reported by 29.2% participants. Prevalence of long COVID among patients with mild/moderate disease was 23.4% as compared to 62.5% insevere/critical cases. Most common Long COVID symptom was fatigue (64.8%) followed by cough (32.4%). Statistically significant predictors of Long COVID were - Pre-existing medical conditions, having a

		significant number of symptoms during acute phase of COVID-19, two doses of COVID-19 vaccination, severity of illness and being admitted to hospital.
Long COVID symptoms and duration in SARS-CoV-2 positive children - a nationwide cohort study (Borch et al)	*Eur J Pediatr*	Aim of study was to evaluate symptoms and duration of 'long COVID' in children. Nationwide cohort study of 37,522 children aged 0–17 years with RT-PCR verified SARS-CoV-2 infection and a control group of 78,037 children. Most reported symptoms among pre-school children were fatigue, loss of smell, loss of taste and muscle weakness. Among school children most significant symptoms were loss of smell, loss of taste, fatigue, respiratory problems, dizziness, muscle weakness and chest pain. Long COVID in children is rare and symptoms resolved within 1–5 months.
Trajectory Curves of post-COVID Anxiety/Depressive Symptoms and Sleep Quality in Previously Hospitalized COVID-19 Survivors: The LONG-COVID-EXP-CM Multicenter Study (Fernández-de-Las-Peñas et al)	*Psychol Med*	We present a study investigating trajectory curves of post-COVID anxiety/depressive symptoms as well as sleep quality, fitted with exponential trajectory model, in previously hospitalized COVID-19 survivors. Mosaic plots revealed prevalence of anxiety symptoms slightly decreased from 16% at T1 to 15.1% at T2, whereas prevalence of depressive symptoms decreased from 18% at T1 to 13.2% at T2.
Prevalence of Long COVID symptoms in Bangladesh: A prospective Inception Cohort Study of COVID-19 survivors (Hossain et al)	*BMJ Global Health*	Objective of study was to identify prevalence of long COVID symptoms in a large cohort of people living with and affected by long COVID and identify any potential associated risk factors. Cardiorespiratory parameters measured at rest (heart rate, systolic blood pressure, diastolic blood pressure, oxygen saturation levels, maximal oxygen consumption, inspiratory and expiratory lung volume) were also measured. Among 2198 participants, prevalence of long COVID symptoms at 12 weeks was 16.1%. 8 long COVID symptoms were identified and in descending order of prominence are: fatigue, pain, dyspnoea, cough, anosmia, appetite loss, headache and chest pain. People living with and affected by long COVID experienced between 1 and 8 long COVID symptoms with an overall duration period of 21.8±5.2 weeks.
Evaluation of 3-month follow-up of patients with post-acute COVID-19 syndrome (Kerget et al)	*J Med Virol*	Study aimed to evaluate patients with post-acute COVID-19 over 12 weeks of follow-up. Evaluation of laboratory parameters at 4 and 12 weeks showed that group 3 had higher lactose dehydrogenase (LDH) level and lower mean platelet volume than other groups at both time points. Group 3 also had lower FVC%, FEV1%, and 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.
Determinants of COVID-19-Related Length of Hospital Stays and Long COVID in Ghana: A Cross-Sectional Analysis (Crankson et al)	*Int J Environ*	There is paucity of data on determinants of length of COVID-19 admissions and long COVID, an emerging long-term sequel of COVID-19, in Ghana. This study identified these determinants and discussed their policy implications. Regression analyses showed that, on average, COVID-19 patients with hypertension and diabetes mellitus spent almost 2 days longer in hospital had 4 times the odds of long COVID compared to those with no comorbidities. In addition, the odds of long COVID decreased with increasing patient's education level.
Perception, Prevalence, and Prediction of Severe Infection and Post-acute Sequelae of COVID-19 (Knightet al)	Am J Med Sci	Aim of study was to assess, characterize, and describe the prevalence and predicting factors of patient-reported severe COVID-19 infection and post-acute sequelae of COVID-19 (PASC). We prospectively surveyed patients who received care in our outpatient clinic for COVID-19 from Mar-Aug, 2020, and then retrospectively reviewed their electronic health records. Of those receiving survey, 437 adult patients with different degrees of severity of COVID-19 illness responded. In total, 34.9% had persistent symptoms, and 11.5% were hospitalized. The most common symptom was fatigue (75.9%), followed by poor sleep quality (60.3%), anosmia (56.8%), dysgeusia (55%), and dyspnea (54.6%). Predicting factors for PASC were female sex and a negative psychological impact of the disease. Age, hospitalization, persistent symptoms, psychological impact (eg,

		anxiety and depression), and time missed from work were significantly associated with perception of having severe COVID-19 illness. Hospitalization was not significantly associated with PASC.
Functional status, mood state, and physical activity among women with post-acute COVID-19 syndrome (Carter et al)	*medRxiv*	Case-control design was employed to assess attendant effects on functional status, mood state, and leisure-time physical activity (PA) in post-acute COVID-19 syndrome. SARS-CoV-2 participants exhibited poorer functional status and reduced leisure-time PA compared to controls. Significant between-group differences were also detected for POMS total mood disturbance with sub-scale analyses revealing elevated tension, confusion, and lower vigor among SARS-CoV-2 participants. Number of SARS-CoV-2 symptoms (e.g., loss of taste / smell, muscle aches etc.) were associated with confusion.

COMMENTARIES, LETTERS AND OPINION PIECES (*DEC 16, 2021-JAN 14, 2022*)

- Long COVID: For the 1 in 10 patients who become long-haulers, COVID-19 has lasting effects *(Toronto Star)*: Some of long COVID's effects appear to be caused by inflammation, which is part of the body's typical reaction to any virus. This reaction is exaggerated in COVID-19, especially in terms of the immune system's inability to return to normal function. When a patient's body is unable to eliminate a virus quickly, it escalates its immune response, and can end up making antibodies against itself. Some of what we are seeing with long COVID may be due to the collateral damage from that response, especially when the inflammation resulting from the acute infection was severe. The health-care system needs to plan for the resources to care for this significant group of patients, perhaps for years after the pandemic has subsided.
- Towards a universal understanding of post covid-19 condition *(Bulletin of the WHO)*: Fewer than 1% (45/5000) of ongoing COVID-19 research studies are focused on studying post COVID-19 condition – or its associated terminologies. Most studies are based on patients from hospital series. For this reason, new research from primary care and community-based settings is essential to incorporate the experience of those patients who were less likely to be hospitalized, including younger patients, and those who had either a mild infection with fewer symptoms or were undiagnosed. Low antibody titres may be correlated with persistent symptoms and patients with low or no antibodies should be included in research.
- The contested meaning of "long COVID" – Patients, doctors, and the politics of subjective evidence *(Social Science and Medicine)*: Experiential knowledge can fill crucial gaps in the pandemic discourse. Long COVID online self-advocacy provides a rich source of subjective evidence. Patient subjective evidence is challenging the normative role of clinical evidence. Activism made long COVID diagnosis as a requirement for recognition obsolete.

MEDIA HIGHLIGHTS

CANADA

- **Everything we know about long COVID, from strange phantom smells to chronic fatigue (National Post):** With 271 million confirmed infections worldwide, some researchers have warned long COVID is the next "looming catastrophe," with prevalence estimates all over the map, from as low as two per cent of the COVID "recovered" to as high as 89 per cent. Some have called for greater nuance and a more cautious approach to thinking about long COVID, worried that, without clear, diagnostic tests, some symptoms are being misattributed to SARS-CoV-2. Under WHO's definition of long COVID, there's no need for proof of a lab-confirmed infection. It includes a history of probable infection, acknowledging that many people didn't have access to testing early in the pandemic.
- **One of B.C.'s few COVID recovery clinics faces possible closure, patients say (CBC):** A patient at one of B.C.'s few post-COVID-19 recovery clinics says he has been told the service is at risk of closure, potentially jeopardizing the health of hundreds of B.C. patients known as long-haulers. A spokesperson for Fraser Health has not confirmed if the clinic would close in March, but pointed to an evaluation of the post-COVID clinic program that ended in December. Currently in the province, those who want to access long COVID care have to provide either a positive PCR test or a positive serology report, the latter of which can only be accessed through private medical labs. In light of the testing limits, the province has said they would be reviewing eligibility requirements for long COVID clinics "to ensure continued equitable access."
- **Omicron 'isn't a regular cold,' Quebec doctor says, urging people to avoid infection and risk of long-COVID (CTV News):** "This isn't like a regular cold," infectious diseases specialist Dr. Emilia Liana Falcone said, explaining that nobody should be under the impression that catching Omicron, or any other variant, is a good idea. "Even individuals who have very mild symptoms or even no symptoms can develop long-term sequelae (after-effects) of COVID," she said, adding that applies to people who are vaccinated and unvaccinated.
- **COVID-19: People suffering from long-COVID fight uphill battle for acknowledgment and support (Vancouver Sun):** Dr. Angela Cheung is leading two research studies on long-COVID funded by the Canadian Institutes for Health Research. "Just two years ago, we really didn't have anything to treat COVID in the acute care setting and now we have a number of treatments which improve outcomes" said Cheung. "And now we are looking at treatments in the outpatient setting to try to decrease long-COVID both in prevention and in treatment, so I would stay tuned. The federal government has promised to spend $20 million a year on long-COVID research.

GLOBAL

- **What the long COVID numbers aren't telling us (Rolling Stone):** Early studies estimate that between 10 and 30 percent of coronavirus patients will experience Long Covid — but research is just scratching the surface. The type of Long Covid statistics people expect are the kind that result from large-scale studies conducted by the National Institutes of Health (NIH) that follow a group of people over a long period of time, says Natalie Lambert, PhD, a biostatistician and associate research professor of biostatistics and health data sciences at the Indiana University of School of Medicine.
- **Long COVID brain fog found similar to 'chemo brain'; clip-on device shows promise in virus detection (Reuters):** The "brain fog" reported by some people after COVID-19 shows striking similarities to the condition known as "chemo brain" - the mental cloudiness some people experience during and after cancer treatment, according to new research. People who had COVID-19 "frequently experience lingering neurological symptoms, including impairment in attention, concentration, speed of information processing and memory," similar to patients with cancer therapy-related cognitive impairment that is known to involve inflammation of the brain, the researchers explained in a report posted on *bioRxiv*.

POST-COVID-19 RESOURCES

- (NEW) 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.

- Pre-populated literature searches: Long COVID search (LitCovid) and Long COVID search (NIH)

- ECDC: Webinar on post-COVID-19 condition in children (December 7).

***Note**: Previous OCSO Post COVID-19 Condition Scans can be found here.*