POST COVID-19 CONDITION

OCSO BIWEEKLY SCAN OF EVIDENCE #25

June 4 - June 17, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition 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

According to the World Health Organization (WHO), post COVID-19 condition (PCC) refers to persistent symptoms occurring 12 weeks or more after an acute COVID-19 infection, which persist or reoccur for a minimum of 8 weeks. The most common symptoms that we know of in adults include: fatigue, memory problems, sleep disturbances, shortness of breath, anxiety and depression, general pain and discomfort, difficulty thinking or concentrating and post-traumatic stress disorder (PTSD). There is still a lot that we don't know about post COVID-19 condition in children.

PCC is also referred to as long COVID, post-acute sequelae, post COVID-19 symptoms, and post-acute COVID-19 syndrome. Prior to the WHO definition, a number of studies reported on post-acute sequelae (PAS) from 4 to 12 weeks post diagnosis. The Public Health Agency of Canada (PHAC) released a review of the current international evidence (November 2021). Over 100 symptoms or difficulties conducting usual activities of daily living were reported.

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's currently no universally agreed-upon approach to diagnose and treat post COVID-19 condition. Early evidence suggests that vaccination with 2 or more doses may help reduce the risk of developing post COVID-19 condition if infected. Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with PCC. Multidisciplinary teams in "long COVID" clinics have been set up to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

People who have been hospitalized or who needed intensive care during recovery appear to be at greater risk of experiencing longer-term effects. However, recent research shows about 30% to 40% of people who weren't hospitalized for their initial COVID-19 infection still report symptoms beyond 12 weeks. Canadians suffering from PCC and who are unable to work because of their symptoms may be eligible for support through: Employment and Skills Development Canada's Employment Insurance (EI) Program and Canada Pension Plan Disability Benefits.

This week's scan includes a systematic review preprint examining non-pharmacological therapies for post-viral syndromes, including Long COVID, as well as a NIH Director's Blog discussing how Artificial Intelligence could advance our understanding of Long COVID.

GUIDELINES OR STANDARDS

- **WHO** developed a clinical case definition of PCC in October 2021. This first version was developed by patients, researchers and others with the understanding that the definition may change as new evidence emerges.
    - *"Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time."*
    - **WHO:** Q&A page on Post-COVID-19 Condition (February 2022).

- **US CDC** describes Post-COVID conditions as a wide range of new, returning, or ongoing health problems that people experience after first being infected with the virus that causes COVID-19. The CDC posted Interim Guidance (Updated June 2021) 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 (Updated March 2022). CDC is using science to learn more about post-COVID conditions.

- UK **NICE**: Rapid guidelines for managing the long-term effects of COVID-19 (Updated March 2022).

- **Chartered Society of Physiotherapy** in UK published its COVID-19 rehabilitation standards (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).

- 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 (continuously updated)

- **Center for Effective Practice** – COVID-19: Clinical Guidance for Primary Care Providers - Long-term symptoms / Post-acute sequelae of COVID-19 (PASC) (last updated April 2022)

- *Wiener klinische Wochenschrift*: Guideline S1: Long COVID: Diagnostics and treatment strategies (December 2021)

- American Academy of Physical Medicine and Rehabilitation (**AAPM&R**): Cognitive Symptoms Guidance & Breathing Discomfort Guidance (December 2021).

- Royal Australian College of General Practitioners (**RACGP**) guidance for GPs caring for patients with post–COVID-19 conditions (December 2021).

- European Society of Clinical Microbiology and Infectious Diseases (**ESCMID**): Rapid guidelines for assessment and management of long COVID (February 2022)

- **ACAS** (UK-based Advisory, Conciliation and Arbitration Service): Long COVID – advice for employers and employees (last reviewed April 2022)

- **Ontario Health** Post COVID-19 Condition - Guidance for Primary Care (PDF)

- **Scottish Government Guidelines:** Managing the long-term effects of COVID-19

NATIONAL AND INTERNATIONAL DEVELOPMENTS *(JUNE 4 - JUNE 17)*

CANADA

- (UPDATED) It is unclear how many specialized clinics there are in Canada for long COVID, although some estimates put the number at 20+. In Manitoba, there are no multidisciplinary, long-COVID clinics.

UK

- (NEW) The risk of developing long covid is lower among people with the Omicron variant of SARS-CoV-2 than with Delta, shows an analysis of self reported data to the UK ZOE covid app. Researchers from King's College London looked at data logged by 56,003 adults who tested positive between 20 December 2021 and 9 March 2022, when the omicron variant was dominant. They compared these with 41,361 who tested positive between 1 June 2021 and 27 November 2021, when the Delta variant was most common.
- (NEW) Official Statistics released June 15 from the COVID-19 Schools Infection Survey, England: round 3 questionnaire analysis, March 2022 - Long COVID. Findings show:
    - Nearly 1 in 50 (1.8%) primary school pupils (years from reception to year 6) and nearly 1 in 20 (4.8%) secondary school pupils (years 7 to 13) had experienced long COVID following their most recent COVID-19 infection.
    - Significantly more secondary school pupils who reported having COVID-19 had experienced loss of smell or taste, cardiovascular symptoms, or systemic symptoms (fever or high temperature) than those who reported not having had COVID-19.
    - Secondary school pupils in years 7 to 13 with long COVID were significantly more likely to have a probable mental disorder (28.1%) than those without long COVID (12.3%).

US

- No updates.

EMERGING SCIENTIFIC EVIDENCE *(JUNE 4 – JUNE 17)**

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
A primer on Post-COVID-19 conditions and implications for clinical pharmacists (Cluck et al)	Review (Available in *J Am Coll Clin Pharm*)	In the wake of the acute illness, many survivors fully recover and return to baseline, while others suffer from a wide range of lingering symptoms collectively known as "post-COVID conditions". The recognition of these conditions as a clinical entity represents the first step in developing a targeted plan for recovery and symptom mitigation. While interventions to directly minimize or reduce new, recurrent, or persistent symptoms are currently unknown, pharmacists can play a key role in optimizing management of these patients.
Fibromyalgia in the new era of SARS-CoV-2 infection and post-COVID-	Scoping Review (Available in	Objective of review was to map the available medical evidence on the impact of COVID-19 and PCS in patients with and without a diagnosis of fibromyalgia prior to infection. Exploratory systematic review in PubMed

19 syndrome: A scoping review (Tuta-Quintero et al)	*Revista Colombiana de Reumatologia)*	and Scopus with data on fibromyalgia in the population surviving SARS-CoV-2 infection.The clinical trial records of the World Health Organization databases were reviewed. Results showed survivors of COVID-19 with or without a previous diagnosis of fibromyalgia may present an increase in chronic pain, insomnia, joint stiffness, and deterioration in quality of life. Population with a history of fibromyalgia may be more affected by psychological stress, tissue damage to neuromuscular structures, and inflammation due to SARS-CoV-2 infection.
Non-pharmacological therapies for post-viral syndromes, including Long COVID: A systematic review (Chandan et al)	Systematic Review (Available in *medRxiv*)	Post-viral syndromes (PVS), including Long COVID, are symptoms sustained from weeks to years following an acute viral infection. Non-pharmacological treatments for these symptoms are poorly understood. This review summarises evidence for the effectiveness of non-pharmacological treatments for symptoms of PVS. It also summarises the symptoms and health impacts of PVS in individuals recruited to studies evaluating treatments.

SELECTED RESEARCH

TITLE AND AUTHOR	SOURCE	SUMMARY
Association of Lung Fibrotic Changes and Cardiological Dysfunction with Hypertension in Long COVID-19 cohort (Tauekelova et al)	*medRxiv*	The prevalence and symptoms associated with long COVID and its comorbidities have not been established. Between May and September 2020 we included 312 patients with post-COVID-19 from 21 primary care centers if they had any persistent symptoms for at least three months from the first onset of the disease. Of 312 persons investigated, there was no significant gender difference between post-COVID-19 clinical manifestations except for memory dysfunction and anxiety, more prevalent among female participants. Chalder Fatigue Score was predominant in female participants (243, 78%). 39 (12.5%) participants reported having type 2 diabetes mellitus, and 158 (50.64%) had hypertension. Our study provides valuable clues for long-term post-sequelae in a cohort of the Long COVID-19 subjects. We demonstrated a strong association of signs of cardiac dysfunction, lung fibrotic changes, increased hemoglobin, fibrinogen, and ferritin with hypertension but not with other comorbidities.
A core outcome set for post-COVID-19 condition in adults for use in clinical practice and research: an international Delphi consensus study (Munblit et al)	*Lancet Respir Med*	Research on post-COVID-19 condition is expanding but, at present, no agreement exists on the health outcomes that should be measured in people living with the condition. To address this gap, we conducted an international consensus study, which included a comprehensive literature review and classification of outcomes for post-COVID-19 condition that informed a two-round online modified Delphi process followed by an online consensus meeting to finalise the core outcome set (COS). 1535 participants from 71 countries were involved, with 1148 individuals participating in both Delphi rounds. Eleven outcomes achieved consensus for inclusion in the final COS: fatigue; pain; post-exertion symptoms; work or occupational and study changes; survival; and functioning, symptoms, and conditions for each of cardiovascular, respiratory, nervous system, cognitive, mental health, and physical outcomes. Recovery was included a priori because it was a relevant outcome that was part of a previously published COS on COVID-19. The next step in this COS development exercise will be to establish the instruments that are most appropriate to measure these core outcomes.

Post-COVID-19 memory complaints: Prevalence and associated factors (Ahmed et al)	*Neurologia*	Memory complaints resulting from COVID-19 may have a significant impact on the survivors' quality of life. Unfortunately, there is insufficient information available on memory loss and its relationship to COVID-19. Therefore, the purpose of this research was to determine the prevalence of memory complaints in post-COVID-19 patients and to find potential contributing factors. A cross-sectional survey was conducted on 401 individuals who had previously been diagnosed with COVID-19 at four COVID testing centers situated across Bangladesh. The MAC-Q questionnaire was used to evaluate memory. A binary logistic regression model was fit to study the variables related to memory complaints, with a p-value of <0.05 deemed statistically significant. Memory complaints was prevalent in 19.2% of the post-COVID patients. Individual predictor analysis revealed that among the treatment modalities, steroids and antibiotics were associated with impaired memory. Multiple logistic regression showed that individuals who recovered from COVID-19 within six to twelve months were more likely to have memory deficits. Even though age, sex, oxygen demand, and hospitalization were not linked with memory complaints, rural residents exhibited more significant memory complaints than urban residents. Conclusion: Nearly one-fifth of the COVID-19 patients suffer from various degrees of memory complaints within one year.
COVID-19, Long COVID Syndrome, and Mental Health Sequelae in a Mexican Population (Villalpando et al)	*Int J Environ Res*	The aim of this study was to evaluate whether a relation between COVID-19, Long COVID, and the prevalence of mental health disorders exist. A total of 203 people from Tabasco were included in this study, answering a survey integrated by three dominions: General and epidemiological data, the DASS-21 test (to determine the presence of signs or symptoms suggestive of depression, anxiety, and/or stress) and an exploratory questionnaire about Long COVID syndrome. Of the 203 people surveyed, 96 (47.29%) had had COVID-19 and 107 (52.71%) had not; from the ones that had COVID-19, 29 (30.21%) presented mental health disorders and 88 (91.66%) presented at least one symptom or sign of Long COVID syndrome; meanwhile, 31 (32.29%) presented 10 or more symptoms or signs. From the comparison between the population with previous mental health disorders and COVID-19 and those without background disorders or COVID-19, the results were the following: 27.58% vs. 16.82% presented severe depression, 48.27% vs. 17.75% presented severe anxiety, and 27.58% vs. 20.56% presented severe stress.
Long COVID-19 Liver Manifestation in Children (Cooper et al)	*J Pediatr Gastroenterol Nutr*	Our aim was to describe pediatric patients who recovered from COVID-19 and later presented with liver injury. This is a retrospective case-series study of pediatric patients with post-COVID-19 liver manifestations. We report five pediatric patients who recovered from COVID-19 and later presented with liver injury. We report two distinct patterns of potentially long COVID-19 liver manifestations in children with common clinical, radiological, and histopathological characteristics after a thorough workup excluded other known etiologies.
Characterization of long COVID-19 manifestations and its associated factors: A prospective cohort study from Iran (Larijani et al)	*Microb Pathog*	The aim of this study was to evaluate the incidence of post-acute COVID-19 syndrome and to identify the associated risk factors as well as to compare new and persistent symptoms at different post-acute phases. Totally 254 individuals from Pasteur Institute of Iran (or/and their relatives) were investigated who had a previously confirmed COVID-19 PCR test. 249 cases progressed the symptoms to acute phase among which 64.1% reported at least one symptom in post-acute phase.

		Neurological sequelae were found as the most frequent symptom (91.6%). There was a significant association between the underlying diseases, age and acute phase symptoms to the post-acute phase syndrome susceptibility.
Post COVID-19 condition and its physical, mental and social implications: protocol of a 2-year longitudinal cohort study in the Belgian adult population (Smith et al)	*Arch Public Health*	The purpose of this paper is to describe the COVIMPACT study, which aims to set up a cohort of people who have been tested positive for COVID-19 and study the evolution of their physical, mental and social health over the medium (3 months) and long term (two years), and the factors associated with an (un)favorable evolution. COVIMPACT is a longitudinal cohort study organised over a two-years period between April 2021 and April 2023. The eligible population is all people aged 18 years and older, living in Belgium, with a recent COVID-19 infection and contacted by the health authorities for contact tracing. In total, 48% of the cohort participants appeared to fit the proposed case definition of PCC (i.e. report at least one symptom related to their COVID-19 infection three months afterwards).
Post-COVID Condition in Adults and Children Living in the Same Household in Italy: A Prospective Cohort Study Using the ISARIC Global Follow-Up Protocol (Buonsenso et al)	*Frontiers in Pediatrics*	Emerging evidence shows that both adults and children may develop post-acute sequelae of SARS-CoV-2 infection (PASC). The aim of this study is to characterise and compare long-term post-SARS-CoV-2 infection outcomes in adults and children in a defined region in Italy. A prospective cohort study including children (≤18 years old) with PCR-confirmed SARS-CoV-2 infection and their household members. A significantly higher proportion of adults compared to children reported at least one persistent symptom at the first follow up. Adults had more frequently coexistence of several symptom categories at both follow-up time-points. Female gender was identified as a risk factor for PASC in adults (p 0.02 at 1–3 months and p 0.01 at 6–9 months follow up), but not in children. We found no significant correlation between adults and children symptoms. In the paediatric group, there was a significant difference in persisting symptoms between those with confirmed SARS-CoV-2 infection compared to controls at 1–3 months follow up, but not at 6–9 months. Our data highlights that children can experience persistent multisystemic symptoms months after diagnosis of mild acute SARS-CoV-2 infection, although less frequently and less severely than co-habitant adults.
Comprehensive clinical assessment identifies specific neurocognitive deficits in working-age patients with long-COVID (Holdsworth et al)	*PLoS One*	Post-COVID illness has become a common, disabling complication of this infection. Therefore, it presents a significant challenge to global public health and economic activity. Comprehensive clinical assessment of previously well, working-age adults in full-time employment was conducted to identify physical and neurocognitive deficits in those with severe or prolonged COVID-19 illness. 205 consecutive patients, age 39 years, 84% male, were assessed 24 weeks after acute illness. 69% reported ≥3 ongoing symptoms. One third of lung function tests were abnormal. Cognitive assessment identified a specific deficit of the same magnitude as intoxication at the UK drink driving limit or the deterioration expected with 10 years ageing, which appears to contribute significantly to the symptomatology of long-COVID.

*Note: Content may have been published prior to this scan period but was only available through applying our search strategies during this period.

COMMENTARIES, LETTERS AND OPINION PIECES *(JUNE 4 – JUNE 17)*

- Post-COVID-19 condition in children: a COS is urgently needed (*Lancet Respir Med*): Research into post-COVID-19 condition in children and young people is lagging behind that in adults. This gap might partly be due to studies early in the pandemic indicating that children and young people infected with SARS-CoV-2 were mainly asymptomatic or had mild symptoms. Later studies have shown that post-COVID-19 condition can affect both children and adults even after mild COVID-19. The prevalence of post-COVID-19 condition in children and young people is unclear, with studies suggesting that between 4% and 66% of those who have had COVID-19 can be affected, depending on the outcome definition and methods used. There is an urgent need to initiate projects that aim to develop a core outcome set (COS) and associated measurement and data harmonisation tools for research on post-COVID-19 condition in children and young people.

- Using AI to Advance Understanding of Long COVID Syndrome *(NIH Director's Blog)*: A recent study, published in *Lancet Digital Health*, shows that a well-trained computer and its artificial intelligence can help understand long COVID. Researchers found that computers, after scanning thousands of electronic health records (EHRs) from people with Long COVID, could reliably make the call. The results, though still preliminary and in need of further validation, point the way to developing a fast, easy-to-use computer algorithm to help determine whether a person with a positive COVID test is likely to battle Long COVID.

MEDIA HIGHLIGHTS *(JUNE 4 – JUNE 17)*

CANADA

- **Specialized clinics to treat long COVID are in demand and physicians say they can't keep up (*CBC News*):** Doctors say demand is growing for specialized clinics to treat post-COVID condition, in part due to increased awareness of what symptoms are. While clinics have opened in a number of locations, the wait lists are also growing. With a lack of funding and staffing, physicians say they can't keep up. Dr. Kieran Quinn, clinician scientist at Sinai Health and the University of Toronto, is leading a large research program looking at health services for people with post-COVID condition.
- **A 'tsunami' of long COVID cases is about to hit, and some say the health-care system isn't ready (*Ottawa Citizen*):** "It is predicted that long-term COVID will lead to a substantive and sustained impact on our health system," Senator Stan Kutcher told a long COVID awareness conference this week. "And let's remember this is a system that can be currently characterized as running on empty." Kutcher, a psychiatrist specializing in adolescent mental health who serves as an independent senator, has focused on issues such as vaccine disinformation since being appointed to the Senate. He is calling for changes — including a focus on health system readiness and better disability support — to help people suffering from long COVID. He was speaking as part of a virtual town hall to mark National Long COVID Awareness Day in Canada. The event was organized by the group COVID-19 Resources Canada and featured researchers, physicians and patients.

GLOBAL

- **Clues to Long COVID (*Science*):** "The two diseases"—acute COVID-19 and Long Covid—"aren't very different," posits David Lee, an emergency medicine doctor at New York University Grossman School of Medicine. He suspects microclots explain many chronic symptoms. At least 70% of Long Covid patients have respiratory problems, he estimates, and at least 30% suffer from dysautonomia, in which abnormalities in the autonomic nervous system disrupt heart rate, breathing, and digestive function. Many suffer from fatigue and what's often called "brain fog." Tiny clots in the brain could explain cognitive troubles, Lee notes; or clots may kill small fiber nerve cells and drive dysautonomia. But solid evidence that microclots cause Long Covid symptoms is still lacking.

POST COVID-19 CONDITION RESOURCES

- (NEWLY ADDED) Long COVID Physio: Long COVID Physio is an international peer support, education and advocacy, patient-led association of Physiotherapists living with Long COVID and allies. They post various educational videos on long COVID.

- (NEWLY ADDED): John Hopkins Medicine - Long-Term Effects of COVID-19

- C19 Recovery Awareness (US): The mission of the Long Haul COVID Fighters is to provide support for those whose health has been affected by COVID-19, promote public awareness and education regarding lengthy COVID recovery, and advocate for the medical, mental health, and social interests of long haul COVID survivors.

- COVID-19 Virtual Library of Health Data and Evidence (Canada): Resources to knowledge products, data and evidence on the impacts of COVID-19, which includes post COVID-19 condition. This is a searchable collection of products funded and published by the Government of Canada.

- Lullabies for long COVID (UK): An online program developed in collaboration with the English National Opera could help with rehabilitation, by improving mental health and symptoms of breathlessness.

- Solve Long Covid Initiative (US): The Solve ME/CFS Initiative is a non-profit organization that serves as a catalyst for critical research into diagnostics, treatments, and cures for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), Long Covid and other post-infection diseases.

- PASC Guide (University of Michigan): A resource for people with PASC/long COVID.

- Health Education England (HEE) e-learning modules: long COVID programme

- Voices of Long COVID (US): Voices of Long Covid campaign features testimonials from a diverse group of people ages 18-29 who are suffering from long-term complications of COVID-19 infection.

- Dignity Health (US): COVID-19 and Chronic Illness Recovery Program based in the U.S. has helped over 2,000 people struggling with COVID long-term effects ("COVID long haulers"). Treatment is exercise-based for lingering or long-term conditions (sequelae) from having the virus.

- Altea (Switzerland): A network for sharing evidence-based information on the long-term effects of COVID-19.

- Pandemic-Aid Networks: Long COVID research library.

- Post-COVID-19 Functional Status Scale: An overview of a patient self-reported scale that helps to support assessment of functional status and recovery after the SARS-CoV-2 infection.

- Ontario College of Family Physicians: Resources on Post-COVID Condition.

- Agency for Clinical Innovation (Australia): Living Evidence - post acute sequelae of COVID-19.

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

- PAHO Webinar Series on Post COVID-19 Condition launched 17 February, 2022, from 10:30 am to 12:30 pm (EST).

- Body Politic COVID-19 Support Group (Global): Housed on the Slack app, group members have access to dozens of different channels, which give space for more personal discussion. Some of the channels include those specifically for medical professionals, parents of children with Covid-19, LGBTQ+ individuals, BIPOC+, and different regions around the world.

- Patient-Led Research Collaborative (Global): Self-organized group of Long COVID patients working on patient-led research around the Long COVID experience.

- 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.

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

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