

Welcome to the
Division of Continuing Medical Education's
Post-COVID Condition
Spring 2023 Webinar Series

This event was made possible thanks to funding provided by the Saskatchewan Health Authority



Treaty Acknowledgement

Our college acknowledges that our campuses and sites are on treaty territories 2, 4, 5, 6, 8, and 10, and the Homeland of the Métis. We respect that Indigenous people have rich cultural and traditional practices that have been known to improve health outcomes. All attendees are invited to reflect on the territories you are calling in from as we commit ourselves to gaining knowledge; forging a new, culturally safe relationship; and contributing to reconciliation.



BE WHAT THE WORLD NEEDS

Who is in the room?

- **Please pick your category or categories:**
 - A person with Post-COVID Condition?
 - A family member of someone with Post-COVID Condition?
 - A healthcare provider?

Digital Learning Experience

- **Questions:**

- Throughout the presentation and during the Q&A period, learners can submit written questions through **Zoom's Q&A function** (anonymously, if desired) or **chat function** (addressed to "everyone")
- During the presentation, learners will be muted
- During the Q&A period following the presentation, learners can **raise their hand** and **unmute** to ask a question

- **Video:**

- Video has been enabled and is optional for learners
- Q&A period following the presentation will be set to speaker view

Dr. Donna Goodridge RN, PhD

- Professor Respiriology, Critical Care and Sleep Medicine
- Executive Director, Respiratory Research Centre
- Chair, Canadian Respiratory Health Professionals Interest Group on Improving Care for People with Advanced Respiratory Illness



Dr. Andrea Vasquez Camargo MD, MSc, CCFP

- Physician Lead, Long COVID Educational Needs Assessment Project, Continuing Medical Education Division, University of Saskatchewan
- Family Physician - Regina Family Medicine Unit, University of Saskatchewan Department of Academic Family Medicine
- Assistant Professor, University of Saskatchewan Department of Academic Family Medicine



When COVID Won't Let Go: Understanding the Symptoms of Long COVID or Post-COVID Condition

Donna Goodridge RN, PhD &
Andrea Vasquez Camargo MD, MSc, CCFP

May 24, 2023

Presenter Disclosure

Faculty: Donna Goodridge

Relationships with financial sponsors:

- **Grants/Research Support:** CIHR, SHRF, CABHI (funded research grants)
- **Speakers Bureau/Honoraria:** NONE
- **Consulting Fees:** NONE
- **Patents:** NONE
- **Other:** NONE

Presenter Disclosure

Faculty: Andrea Vasquez Camargo

Relationships with financial sponsors:

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- **Speakers Bureau/Honoraria:** NONE
- **Consulting Fees:** NONE
- **Patents:** NONE
- **Other:** Contracted by USask Continuing Medical Education (CME) Division as the Physician Lead for the Long COVID Program; Participated in the Long COVID Working Group and assisted with the Saskatchewan Health Authority (SHA)'s Final Report in 2021

Mitigating Potential Bias & Supporting Evidence-Based Education

Potential sources of bias have been mitigated.

- Conflict of interest forms are collected and reviewed by committee, Chair and CME office
- CPD material is peer reviewed and elevated to the Director of Accreditation, CME for further review, if required, until in compliance with the national accreditation standards
- Brands/medical equipment/etc. are equally presented with no bias and/or with a generic brand listed
- Survey results are documented, reviewed and addressed when bias is identified



This is Tessa's Story...

Picture – Stock Images – Microsoft PowerPoint



Tessa's Story ...

33 y.o. with 3 children
under 5 years (one 6
months)

RN working in acute
care where she
contracted SARS-CoV-2
in October, 2021

Nausea, Low oxygen
level, ECG changes,
Heart Rate 140 upon
movement, Blood
Pressure 80/50 for first
two weeks

Family dr. referred to
cardiologist – no
answers

Placed on
antidepressants and told
this will be “your new
normal”

Unable to work – first
denied WCB, told she
should have saved more
sick time

WCB referred to clinic in
PA for assessment

This is based on a true story; we have changed some details and her name for confidentiality
Picture – Stock Images – Microsoft PowerPoint

Tessa's Story

Conducted own research and diagnosed herself with POTS (Postural Orthostatic Tachycardia Syndrome)

Her symptoms were dismissed given her young age

“How do I go back to work as a nurse when I have good days, bad days, and I don't see them coming?”

Objectives

By the end of this session, learners will be able to:

Identify

- Identify specific symptoms related to Long COVID/Post-COVID Condition.

Describe

- Describe the most common symptoms associated with Long COVID/Post-COVID Condition (including neuropsychiatric, cardiac, and respiratory).

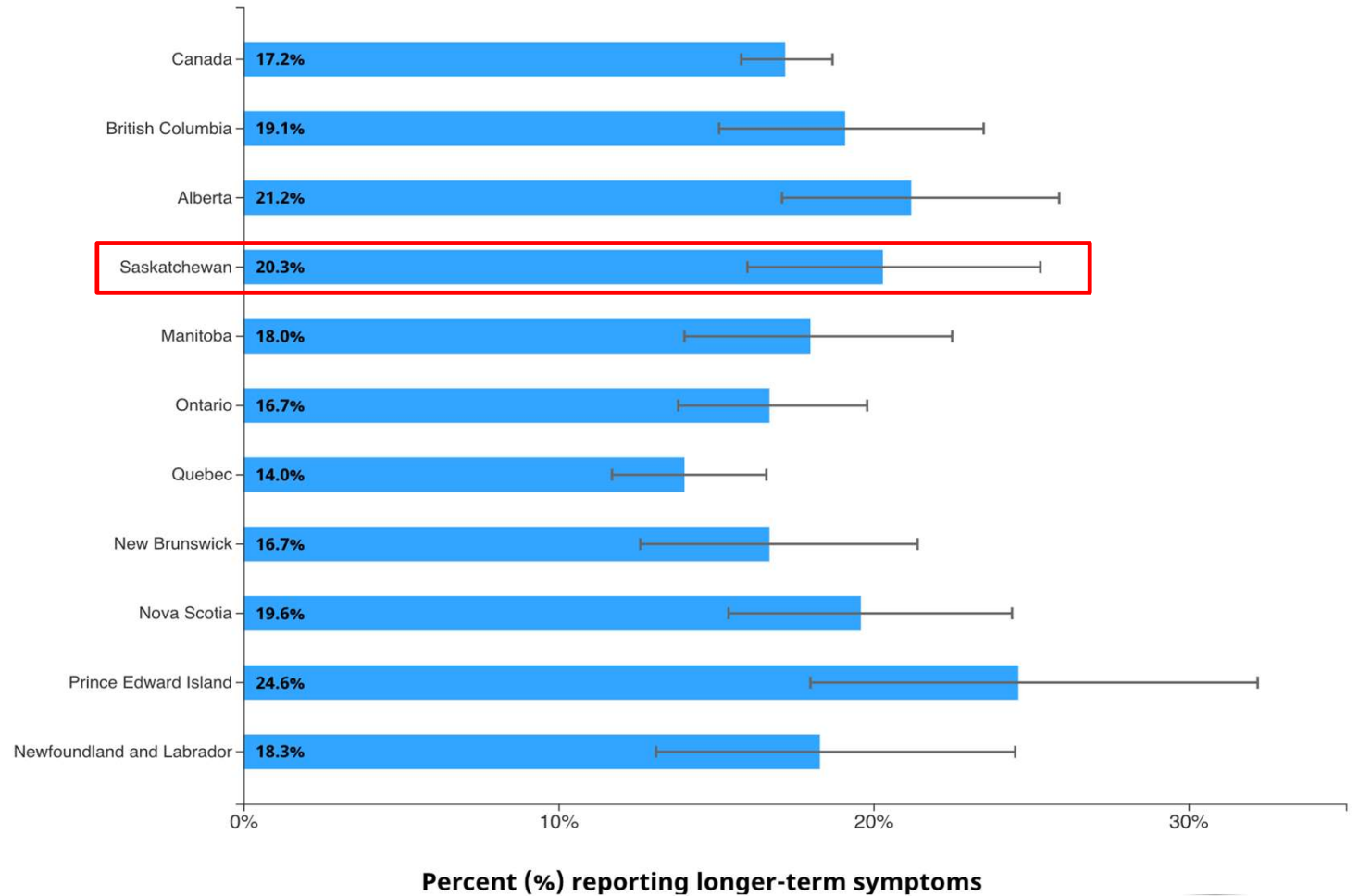
COVID-19 in Canada

- Coronavirus Disease 2019 (COVID-19), is caused by an infection with SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2)
- As of May 16, 2023, **4.7 million infections** confirmed by testing had been officially reported in Canada, but this number is an underestimate
- In 2020, COVID-19 was the third leading cause of death after cancer and heart disease
- COVID-19 affected many aspects of people's lives, both at the time of infection and, for some, up to the present time

**Pandemics
have long
tails**



Figure 1: Percent of adults (aged 18+) self-reporting longer-term symptoms after a positive COVID-19 test or suspected infection by province, Canada, January 2020 to August 2022



Regional variation in longer-term symptoms. Government of Canada, Second Report Spring 2023

<https://health-infobase.canada.ca/covid-19/post-covid-condition/spring-2023-report.html>

What happens after acute infection

***As of May 6, 2023, Government of Canada update - Canada total COVID 19 cases reported 4,669,000
- Saskatchewan total COVID 19 cases reported 155,381**

- Due to changes in COVID-19 testing policies in many jurisdictions since December 2021, case counts are under-estimated.

14.8%

of adults with a confirmed or suspected infection experienced longer-term COVID-19 symptoms

(691,012 patients in Canada)

Saskatchewan 20.3%
= 31,542 patients

47.3%

of adults who experienced longer-term COVID-19 symptoms experienced symptoms for a year or longer

(326,848 patients in Canada)

Saskatchewan
= 14,919 patients

21.3%

of adults who experienced longer-term COVID-19 symptoms said that their symptoms often or always limited their daily activities

(147,185 patients in Canada)

Saskatchewan
= 6,718 patients

1. Government of Canada. Spring 2023 Report. <https://health-infobase.canada.ca/covid-19/post-covid-condition/spring-2023-report.html>
2. Government of Canada - COVID-19 epidemiology update: Summary - <https://health-infobase.canada.ca/covid-19/>

Post COVID-19 Condition

- AKA: Long COVID, Post-Acute Sequelae of SARS-CoV-2 infection (PASC)
- Post COVID-19 condition **is NOT** SARS-CoV-19 or COVID-19 (acute infection)
- Can affect both adults and children

- "Post COVID-19 Condition, commonly known as long COVID, can affect anyone exposed to SARS-CoV-2, regardless of age or severity of original symptoms".

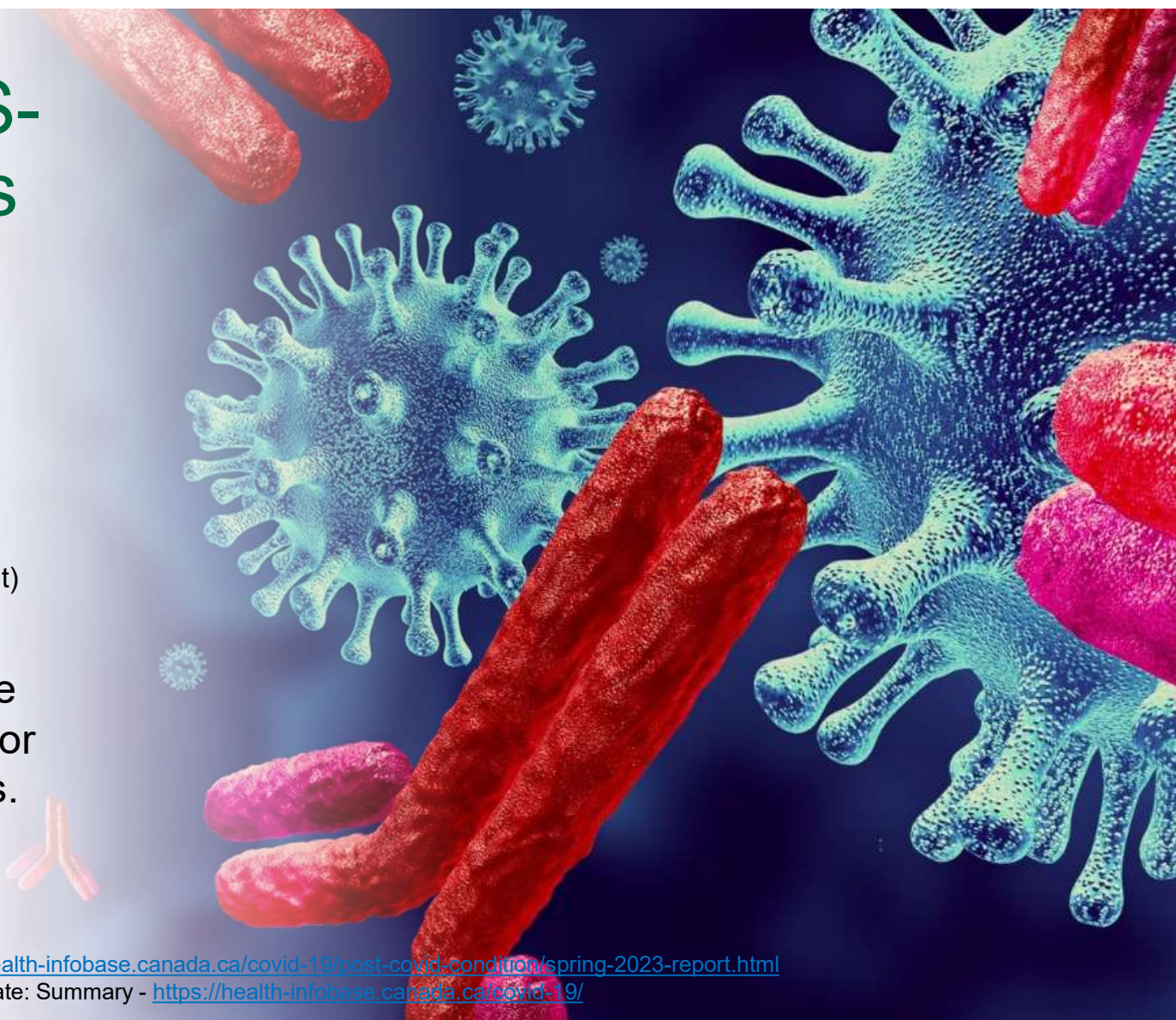
World Health Organization (WHO) Definition

*"Post COVID-19 Condition is defined as the continuation or development of new **symptoms 3 months after the initial SARS-CoV-2 acute infection**, with these symptoms lasting for at least 2 months with **no other explanation**".*

WHO: Post COVID-19 condition (Long COVID), 7 December 2022
<https://www.who.int/europe/news-room/fact-sheets/item/post-covid-19-condition>

Post COVID-19 Condition (Long COVID) Public Health Agency of Canada
<https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/symptoms/post-covid-19-condition.html>

Strain of SARS-CoV-2 Matters



- Omicron strain became dominant in December 2021
- As of April 2023, represents only 9.7%
 - a) Other variants 90%
 - (43 % XBB 1.5 Omicron variant)
- 25.8% of those infected before this time reported symptoms for at least 3 months afterward vs. 10.5% who were infected afterward

1. Government of Canada. Spring 2023 Report. <https://health-infobase.canada.ca/covid-19/post-covid-condition/spring-2023-report.html>

2. Government of Canada - COVID-19 epidemiology update: Summary - <https://health-infobase.canada.ca/covid-19/>

Figure 2: Percent of adults (aged 18+) self-reporting longer-term symptoms after a positive COVID-19 test or suspected infection by sociodemographics, Canada, January 2020 to August 2022

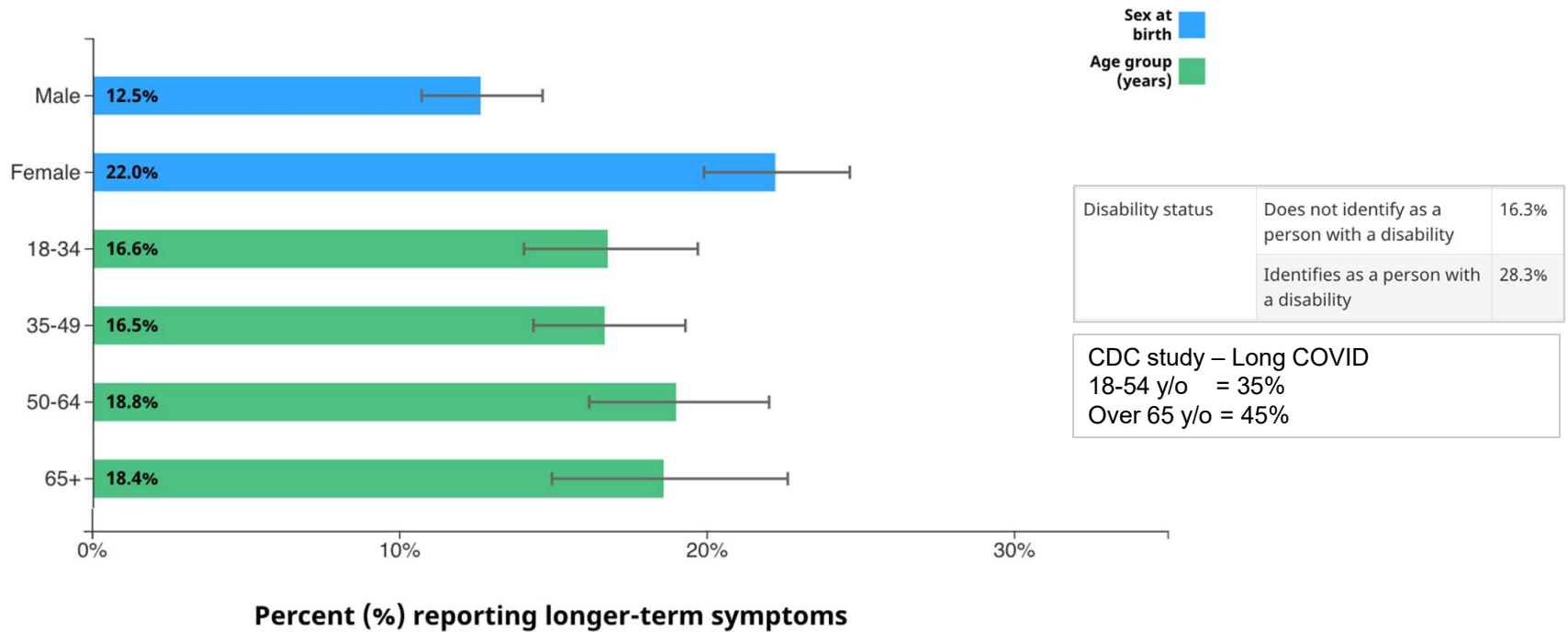
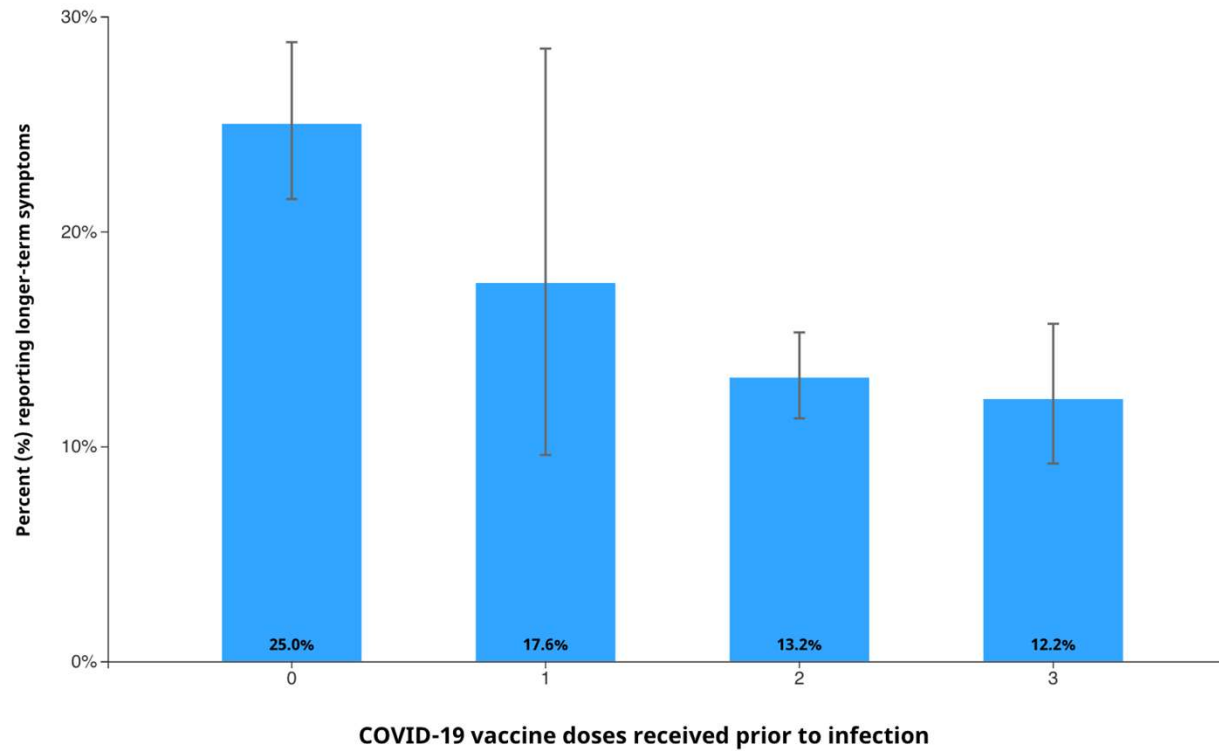


Figure 8: Percent of adults (aged 18+) self-reporting longer-term symptoms after a positive COVID-19 test or suspected infection by number of COVID-19 vaccine doses received prior to infection, Canada, January 2020 to August 2022



Impact of Post-COVID Condition

▼ [Table 4: Limitations of daily activities among Canadian adults with longer-term COVID-19 symptoms](#)

How often daily activities were limited	Percent reporting level of limitation (95% confidence interval)
never	16.9% (14.1%, 20.2%)
rarely	29.4% (25.5%, 33.7%)
sometimes	32.3% (28.6%, 36.3%)
often	15.7% (12.9%, 18.9%)
always	5.6% (4.1%, 7.6%)

Daily Activities - (e.g., preparing meals, housework, running errands, personal care, moving around in one's home).

More than 1 in 5 adults reported being often to always limited by their symptoms

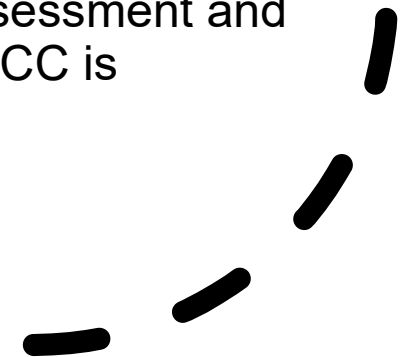


Impact of Post-COVID Condition

- Among adults with longer-term COVID-19 symptoms who had a paid job or were attending school,
 - a) **74.1%** (95% CI: 69.3%, 78.3%) **reported missing one or more days from work or school because of their symptoms** up to the date of completing the survey.
 - b) The average number of missed days from work or school due to symptoms was 20 (95% CI: 15.8, 25.2).

How is Post- COVID Condition Diagnosed?

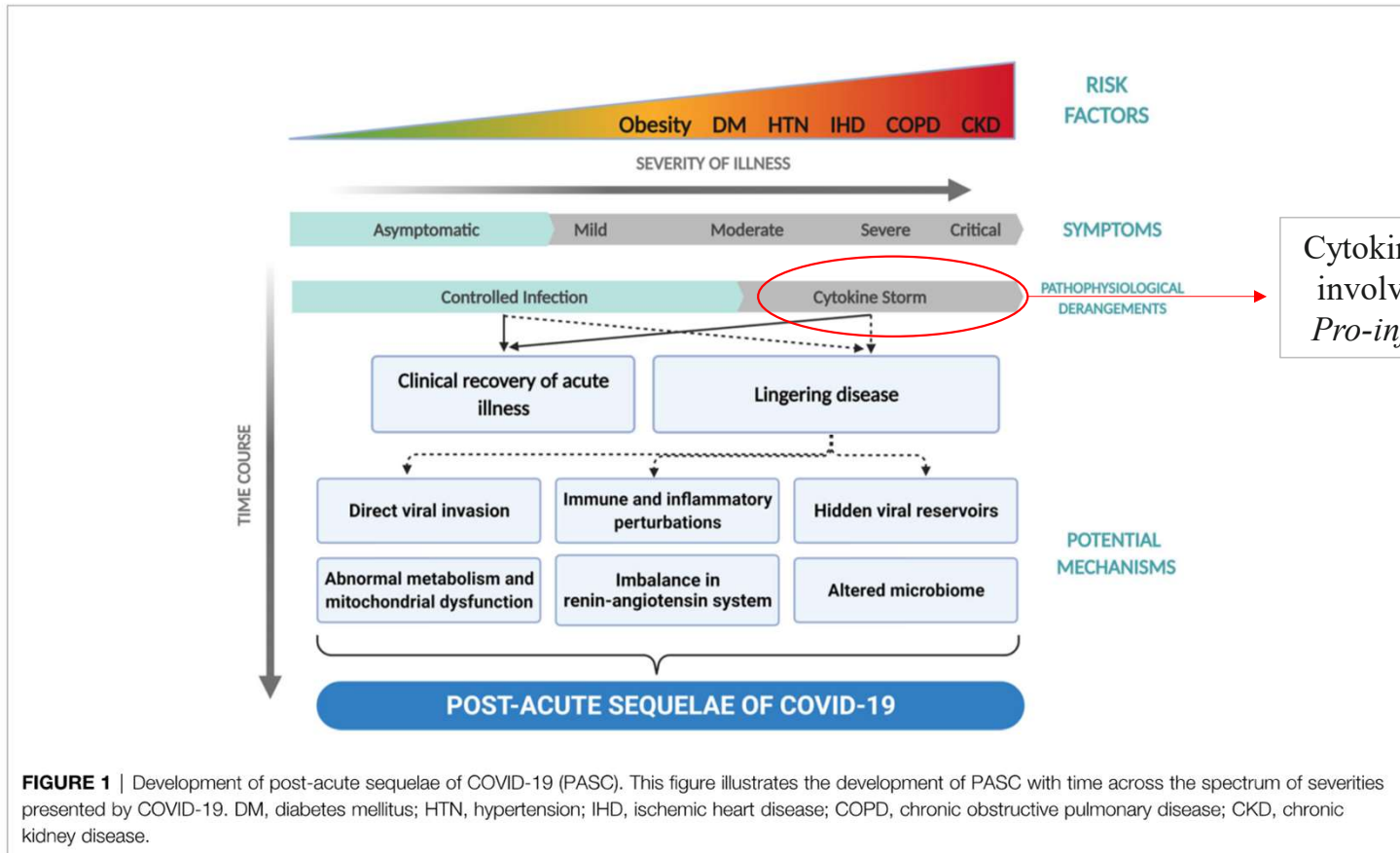
- Health care providers will ask about a person's history of COVID infection, their current signs and symptoms, and past medical history
- No lab test can definitively distinguish PCC from other conditions
 - a) Your health care provider may perform some tests to rule out other conditions based on your symptoms and the clinical judgment.
- The clinical assessment, physical assessment and different lab tests may indicate that PCC is likely present



Unraveling the Mystery Surrounding Post-Acute Sequelae of COVID-19

Rakhee K. Ramakrishnan^{1,2}, Tarek Kashour³, Qutayba Hamid^{1,4}, Rabih Halwani^{1,2,5*} and Imad M. Tleyjeh^{6,7,8,9*}

Frontiers in Immunology



Cytokines are small proteins involved in cell signaling. *Pro-inflammatory response*

FIGURE 1 | Development of post-acute sequelae of COVID-19 (PASC). This figure illustrates the development of PASC with time across the spectrum of severities presented by COVID-19. DM, diabetes mellitus; HTN, hypertension; IHD, ischemic heart disease; COPD, chronic obstructive pulmonary disease; CKD, chronic kidney disease.

Post COVID-19 Condition (PCC) affects everyone differently and over 200 different symptoms have been reported

Most common symptoms of PCC in adults:

- Fatigue
- Trouble sleeping
- Shortness of breath
- Cognitive Problems (e.g., memory loss, difficulty concentrating)
- Mental Health Symptoms (e.g., anxiety, depression)

Most common symptoms of PCC in Children:

- Fatigue
- Headaches
- Sleep problems
- Shortness of breath
- Cognitive problems, such as: (lack of concentration, difficulty thinking)
- Muscle aches and joint pains

Government of Canada. Post
COVID Condition (Long COVID)
(Updated Mar 9, 2023)

<https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/symptoms/post-covid-19-condition.html>

Fatigue

- Most common symptoms reported related to PCC
 - a) 64 – 73 %
- **Fatigue:** An overwhelming feeling of exhaustion that interferes with the ability to function and perform activities¹
- **Chronic Fatigue:** Severe fatigue that lasts longer than 6 months²

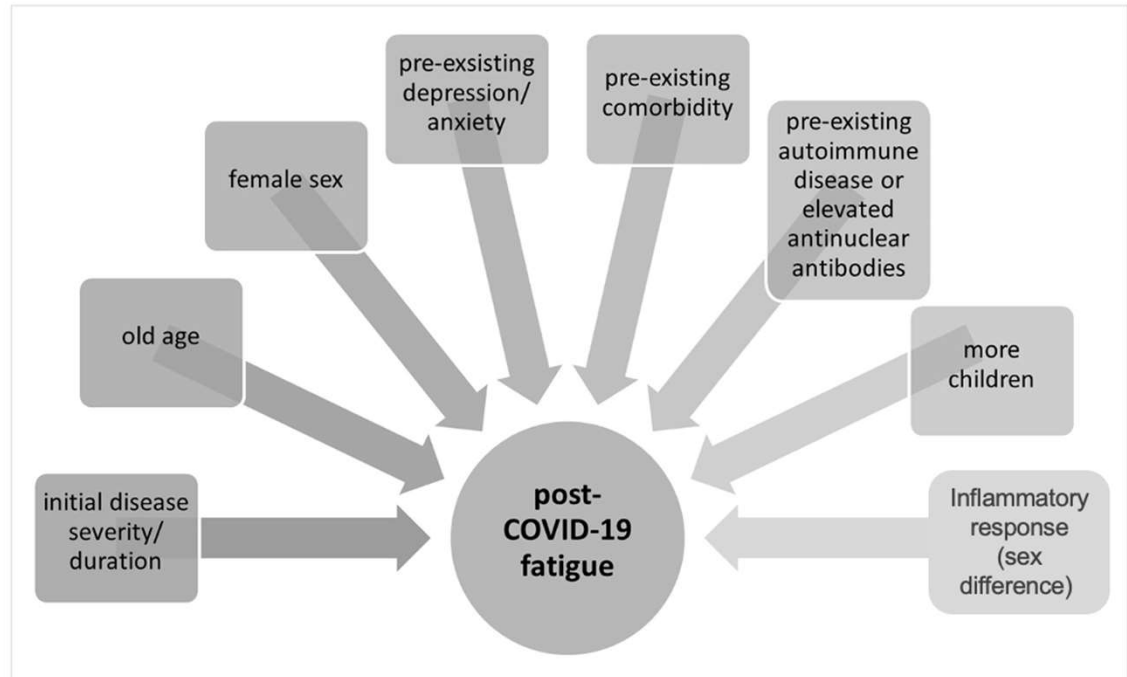


Picture – Stock Images – Microsoft PowerPoint

1. Ream, E. & Richardson, A. Fatigue in patients with cancer and chronic obstructive airways disease: A phenomenological enquiry. *Int. J. Nurs. Stud.* **34**(1), 44–53 (1997).
2. Korenromp, I. H., Meeus, M. & Bleijenberg, G. Dutch language area definition of chronic fatigue. *Ned. Tijdschr. Geneesk.* **156**(16), A4403 (2012).
3. JoliJ, BuckP, Zipfel Sand Stengel A (2022) **Post COVID fatigue: A systematic review.** *Front.Psychiatry* DOI 10.3389/fpsyt.2022.947973

Fatigue

"Post-COVID19 fatigue is defined as a decrease in physical and/or mental performance resulting from changes in central, psychological and/or peripheral factors resulting from COVID-19 disease"



Etiology and Risk Factors of Post COVID Fatigue (adapted)

Fatigue: How patients feel...

- *"I've never undergone total fatigue before. Not being tired, I mean fatigue, you could not do anything."*
- *"If I haven't been very, very careful on how I walk up, by the time I get to the top of the stairs, I'm exhausted, and I can't do anything for a good hour and a half, and I'm just exhausted again."*
- *"And when you're tired and you have fatigue and you have brain fog and you can't think like you normally did and you don't have the physical abilities that you normally did, how can you even begin to go through the system of applying for disability, long-term disability, CPP disability? It's like an endless cycle. You need it but you don't have the ability to do it. And then when you do, no one believes you and you have to fight through the whole system."*

(2022 SK Focus Group Participants)



Chronic fatigue syndrome (ME/CFS)

- Extreme physical fatigue can have : “*muscle fatigue*” and/or “*central fatigue*,”
- Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS)
 - a) It is a biological disease, not a psychological disorder – “Central Fatigue”
 - b) People with ME/CFS are often not able to do their usual activities.
 - Severe fatigue and sleep problems.
 - ME/CFS may get worse after people with the illness try to do as much as they want or need to do - **Post-exertional malaise (PEM)**.
 - Problems with thinking and concentrating, pain, and dizziness.

National Institute of Neurological Disorders and Stroke, Understanding neurological complications of Long COVID. April 2023, <https://www.ninds.nih.gov/news-events/directors-messages/all-directors-messages/understanding-neurological-complications-covid-19>

Low, RN, Low RJ, Akrami, A. A review of cytokine-based pathophysiology of Long COVID symptoms Front. Med., 31 March 2023
Sec. Infectious Diseases: Pathogenesis and Therapy, Volume 10 - 2023 | <https://doi.org/10.3389/fmed.2023.1011936>

Post COVID Condition and Chronic Fatigue Syndrome

How is this related to Post COVID Condition

- There are abundant similarities between symptoms in Long COVID and Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS).

Patients with Post COVID may have features of CFS but other cluster of symptoms may affect patients differently

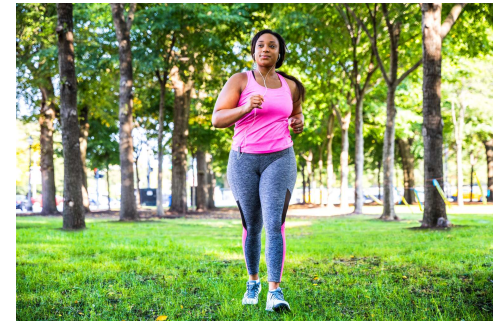
Significant overlap of the symptoms,

- Notably fatigue, unrefreshing sleep
- “Post-exertional malaise”—a general sense of being unwell after even minor physical or cognitive exertion affecting a majority of those with long COVID,
- Problems with memory and attention (“brain fog”)
- Pain and hypersensitivity

Onset of both Long COVID and up to 75 percent of ME/CFS cases can be traced to a viral infection.

Post-Exertional Malaise

- **Post-Exertional Malaise:** Worsening of symptoms following even minor physical or mental exertion, with symptoms typically worsening 12-48 hours after activity and last for days or even weeks
- Reported by nearly 90 % of patients



Picture – Stock Images Microsoft PowerPoint

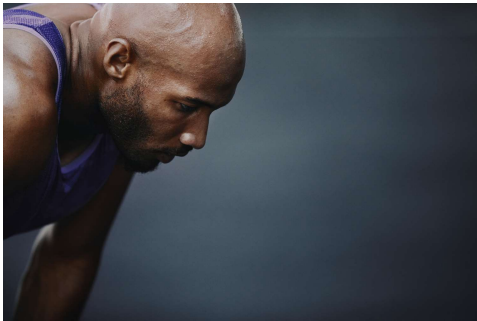
"I could do ...a kids' puzzle for 15 minutes, and I would have to rest physically and cognitively for 14 hours and try again the next day." (2022 SK Focus Group Participant)

Jason LA, Evans M, So Scott J, Brown A. Problems in defining post-exertional malaise. J Prev Interv Community 2015;43:20-31.

Low, RN, Low RJ, Akrami, A. A review of cytokine-based pathophysiology of Long COVID symptoms Front. Med., 31 March 2023 Sec. Infectious Diseases: Pathogenesis and Therapy, Volume 10 - 2023 | <https://doi.org/10.3389/fmed.2023.1011936>

BE WHAT THE WORLD NEEDS

Shortness of Breath (SOB)



Picture – Stock images Microsoft
PowerPoint

- SOB is a common and disabling symptom following COVID-19
- Some people continue to experience SOB even after post-COVID normalization of their cardiac and lung function
- Cause - Lung damage vs other possible changes?

- 46% of patient continued to experience SOB at 6 months (hospitalized)
- 24% non – hospitalized patients
- At 12 months, 49% had no meaningful change in their dyspnea

Shortness of Breath (SOB)

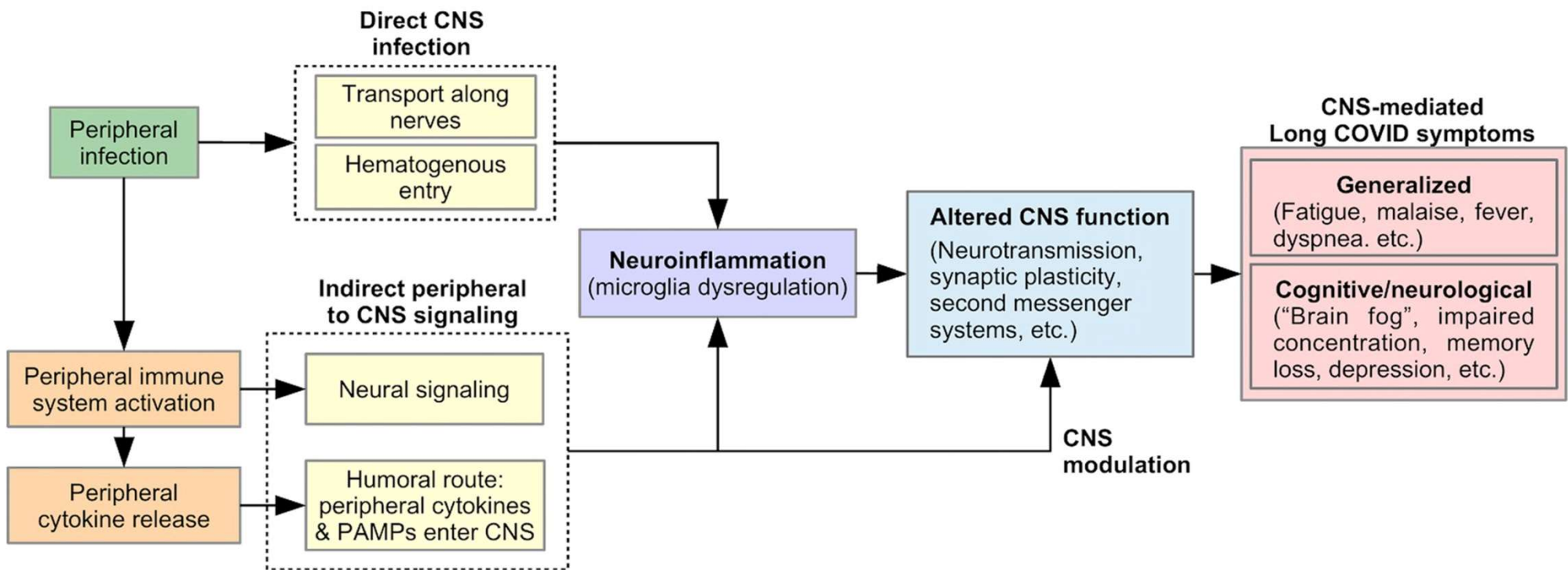


Picture – Stock images Microsoft PowerPoint

- *"I feel if I could breathe, life would be great. I can deal with the rest, just let me breathe."*
- *"It would take me an hour to walk up the flight of stairs and back down... 'cause I was so short of breath"*

(2022 SK Focus Group Participants)

Post COVID Condition: Cognitive Problems



Cognitive Problems

- CNS effects may be due to direct viral invasion, indirect immune response, or immunothrombosis.
- Changes in cognitive ability
 - These changes included a sense of slower and more effortful thinking, trouble concentrating, and problems with memory, processing speed, and attention:

Brain Fog

Pain and hypersensitivity

Autonomic dysfunction

Memory loss

Cognitive Function

Headache

Loss of sense of smell

Sleep disturbances

- Low, RN, Low RJ, Akrami, A. A review of cytokine-based pathophysiology of Long COVID symptoms Front. Med., 31 March 2023
Sec. Infectious Diseases: Pathogenesis and Therapy, Volume 10 - 2023 | <https://doi.org/10.3389/fmed.2023.1011936>

- National Institute of Neurological Disorders and Stroke, Understanding neurological complications of Long COVID. April 2023,
<https://www.ninds.nih.gov/news-events/directors-messages/all-directors-messages/understanding-neurological-complications-covid-19>

Cognitive Problems: Difficulty Concentrating

- *"I started losing words, so I forgot the word for spoon. I forgot the function of a spoon, I was trying to get food from a container into another container and I thought, 'If only there was a tool that I can use to get this food from here to there,' and I couldn't think of a spoon."*
- *"I can't even read a book anymore because it's too much concentration for me."*



Picture – Stock images Microsoft PowerPoint

(2022 SK Focus Group Participants)

Cognitive Problems: Brain Fog

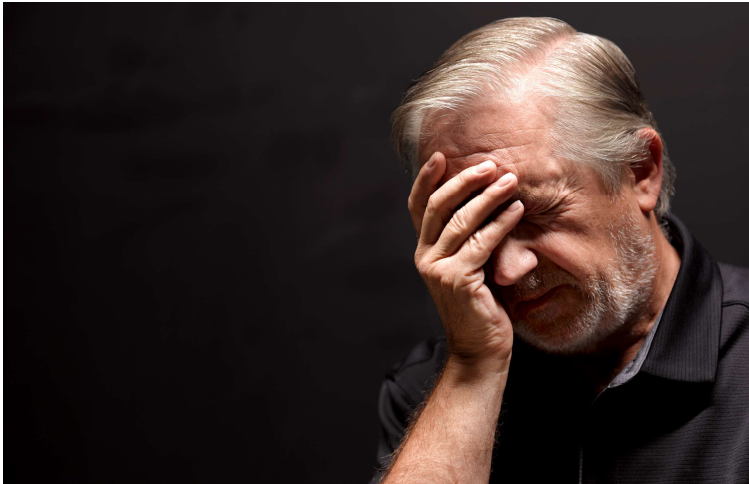


Picture – Stock images Microsoft PowerPoint

- *"The memory fog is horrible. I used to have a mind of a steel trap, now I'm the post-it note girl."*
- *"I couldn't think of – so, every street has a fire hydrant, and I kept telling my husband, 'I can't think of the word, that metal thing at the end of the street, they hook up water to it,'... My words would get stuck in my head, right, I couldn't even. I can't spit my words out, and I'm an extreme multi-tasker, and so for me not to be able to think and spit words out, sometimes is incredibly frustrating."*

(2022 SK Focus Group Participants)

Cognitive Problems: Memory Loss



- *"I haven't been able to remember what I had for supper the next day for a year."*
- *"I'd go, 'Sorry, I couldn't remember your name,' I've worked with her for six years! I couldn't remember, I couldn't form the word, right?"*

Picture – Stock images Microsoft PowerPoint

(2022 SK Focus Group Participants)

Sleep disturbances

- Sleep disturbances 53% of Long COVID patients
 - a) Insomnia 80%
 - b) Poor sleep quality 11%
 - c) Sleep Apnea 8%
 - d) Alter the sleep schedule and Sleep efficiency – time spend in bed asleep*



Picture – Stock images Microsoft PowerPoint

In patients with Long COVID, persistent signs/symptoms of sleep disturbance and fatigue are reported to have an impact on health-related quality of life, productivity, physical activity, and mental ill-health.

Sleep Problems



Picture – Stock images Microsoft PowerPoint

- *"I'll sleep for 20 minutes and then I'll be awake ...when you add that all up, it's like three hours of sleep I've had, but all broken up."*
- *"I wake up and I'm like I'm tired, I need to go to bed."*
- *"I couldn't go back to work because I was sleeping for – I would sleep all night and then I would sleep seven hours a day."*

*(2022 SK Focus Group
Participants)*

BE WHAT THE WORLD NEEDS

PCC and Mental Health conditions

	Anxiety		Mood disorder (Depression)	
	COVID	General	COVID	General
Children (3-17 y/o)	10 %	9.4 %	6.4 %	4.4 %
Adults (18-64 y/o)	18 %	4-10%	11.6 %	10-20%
Older Adult (>65 y/o)	11.7 %	10-15%	9.5 %	10-15%

- Risks of the common psychiatric disorders returned to baseline after 1–2 months
 - a) Mood disorders at 43 days and Anxiety disorders at 58 days)
- The risk of having anxiety after 2 month was the same as previous to COVID infection.
- Psychiatric outcomes were similar during the delta and omicron waves

- [Centers for Disease Control and Prevention](#), Anxiety and depression in children: Get the facts, March 2023.

- Maxime Taquet, et al. Neurological and psychiatric risk trajectories after SARS-CoV-2 infection: an analysis of 2-year retrospective cohort studies including 1 284 437 patients , Lancet Psychiatry 2022; 9: 815–27

- Trends in the prevalence of depression and anxiety disorders among working-age Canadian adults between 2000 and 2016

Mental Health: Depression



Picture – Stock images Microsoft PowerPoint

- *"It's hard to try and stay optimistic ... you can get down in the dumps and be like, [sighs] this sucks. You do get into that depressive state and am I ever gonna get better? And if I'm not, what's the point?"*
- *"You feel like you're a burden to everybody. And it's not – when you're sick, and then you feel like you're a waste of skin to people. It's not a conducive thing for healing or getting better."*

(2022 SK Focus Group Participants)

Mental Health: Anxiety

- *"I'm always scared I'm going to have a heart attack... If I go too far, am I going to have a heart attack, and I'm by myself, so I try not to push too hard."*

(2022 SK Focus Group Participant)



Picture – Stock images Microsoft PowerPoint

Post COVID Condition Headache

- *Reported in 18 % of patients*
- *Worsening of a pre-existing primary headache, or,*
- *New (intermittent or daily) headache*
- Alpha variant - Fever, cough, loss of smell
- Omicron variant - Runny nose, headache and fatigue

- Migraine or tension type



- *Associated with*
- *Decrease of smell sense (Hyposmia), fatigue, cognitive dysfunction, dizziness, and insomnia or other sleep disturbances*
 - a) *Photophobia / phonophobia (45.7% vs. 34%)*
 - b) *Worsening by physical activity (45.7% vs. 34%)*

Headaches

- *“One of my goals is I want to have a day without a headache. I don’t even remember what that’s like.”*

“If I do an hour walk, it seems the pounding of my walking just intensifies the headache.”

“It actually feels like somebody hit me over the back of the head with a baseball bat.”

“Sometimes I know that it’s coming on 'cause I smell cigarette smoke, or the chemically smell. And then the headache will come.”



Picture – Stock images Microsoft PowerPoint

(2022 SK Focus Group Participants)

Musculoskeletal and Joint Pain

- Joint pain has been described in 15% of patients with COVID-19.
- More than 90% of Long COVID patients report musculoskeletal issues, including joint pain (~30% of Long COVID patients)
- Possible injury secondary to immune system response



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Muscle Aches and Joint pains

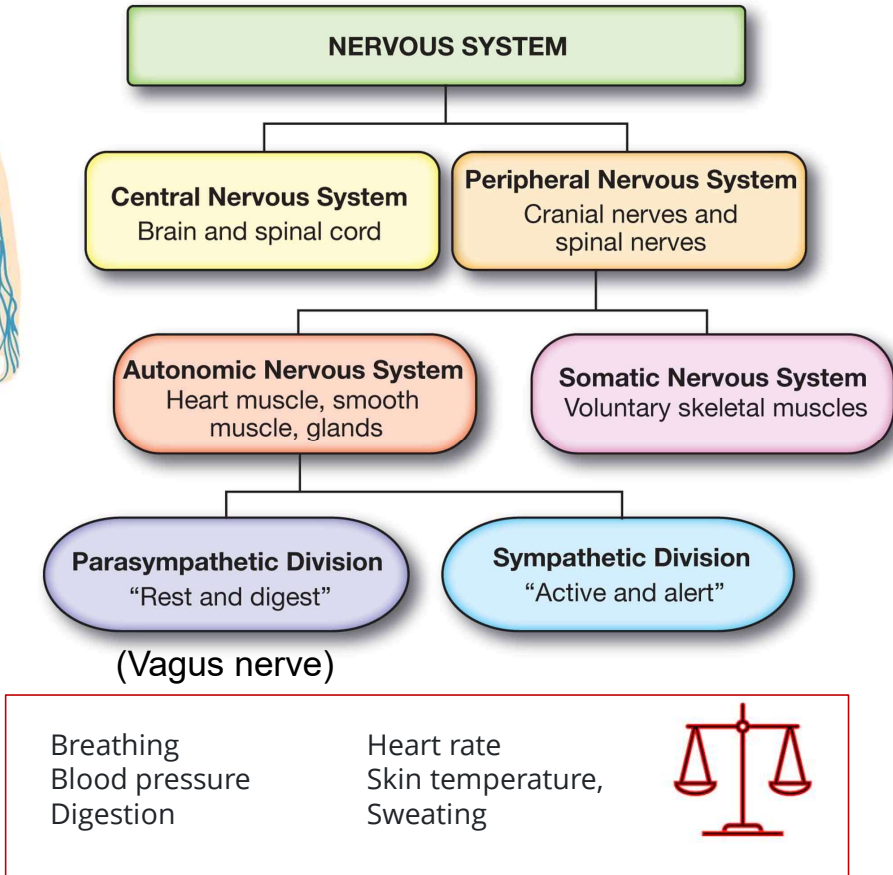
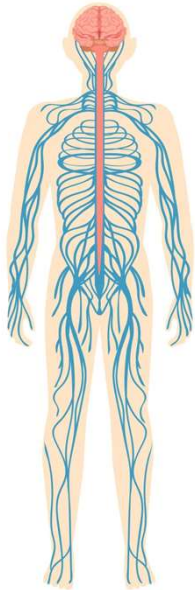


Picture – Stock images Microsoft PowerPoint

- *I was just hurting. My muscles and joints were just hurting so bad, I could hardly move around...I was in so much pain all over, from the top of my head to the bottom of my feet”*

(2022 SK Focus Group Participant)

Autonomic Dysfunction (Dysautonomia)

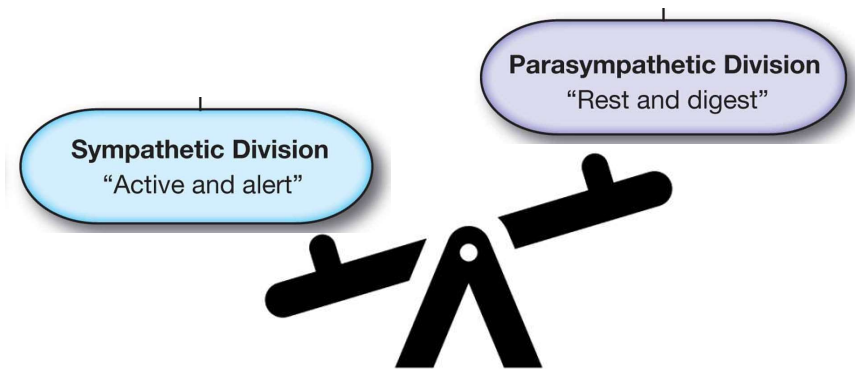


Normal response to stress

- Changes that go back to normal balance

Autonomic Dysfunction – Post COVID

- Virus or immune-related dysfunction of the autonomic nervous system
- It takes longer for the body to go back to a normal balance or state



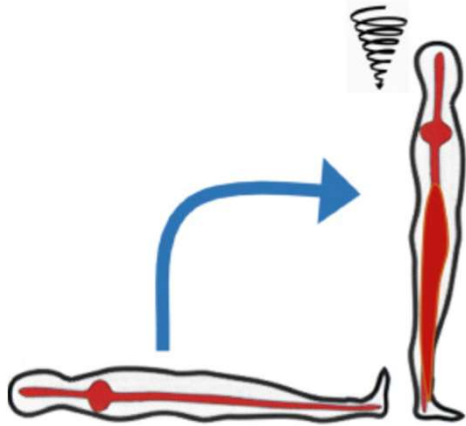
BE WHAT THE WORLD NEEDS

- <https://www.simplypsychology.org/peripheral-nervous-system.html>

- PowerPoint Icons

- Evans, OG, Autonomic Nervous System (ANS) Division And Functions, May 2023 <https://www.simplypsychology.org/autonomic-nervous-system.html>

Orthostatic Intolerance Syndromes



Orthostatic Intolerance symptoms:

- Rapid heart rate (Tachycardia)
- Breathlessness
- Chest pain

It may be more pronounced

- Low blood pressure (Hypotension)
- Dizziness
- Fainting (Syncope)

Transient or long-term orthostatic intolerance syndromes

- An abnormal autonomic response to standing up (orthostasis)

a) Orthostatic hypotension (OH)

- Decrease in blood pressure when standing up (after 3 minutes)

b) Vasovagal syncope (VVS)

- Failure in autoregulation of blood pressure, and ultimately, in cerebral perfusion pressure resulting in transient loss of consciousness.

c) Postural orthostatic tachycardia syndrome (POTS).

- Symptoms when standing up without decreased blood pressure (hypotension)

Dani, M, et al. **Autonomic dysfunction in 'long COVID': rationale, physiology and management strategies** . Clinical Medicine 2021 Vol 21, No 1: e63–7

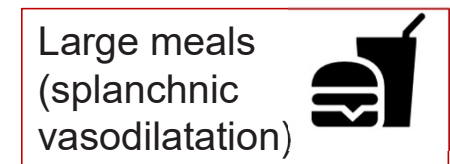
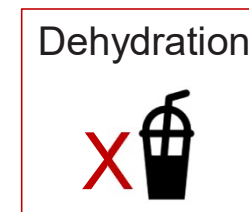
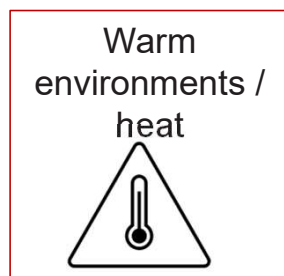
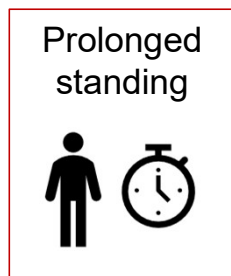
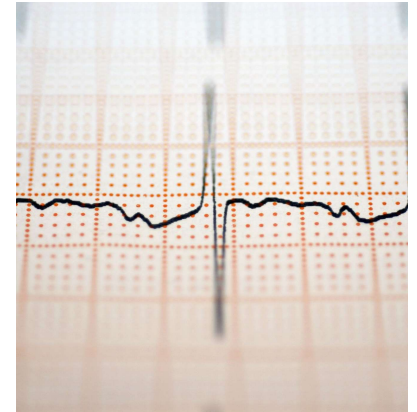
Amr Wahba, et al. **Management of Orthostatic Hypotension in the Hospitalized Patient: A Narrative Review**, The American Journal of Medicine, Volume 135, Issue 1, 2022, Pages 24-31, ISSN 0002-9343,

POTS (Postural Orthostatic Tachycardia Syndrome)

Postural orthostatic = caused by upright position

Women, 15 – 50 y/o

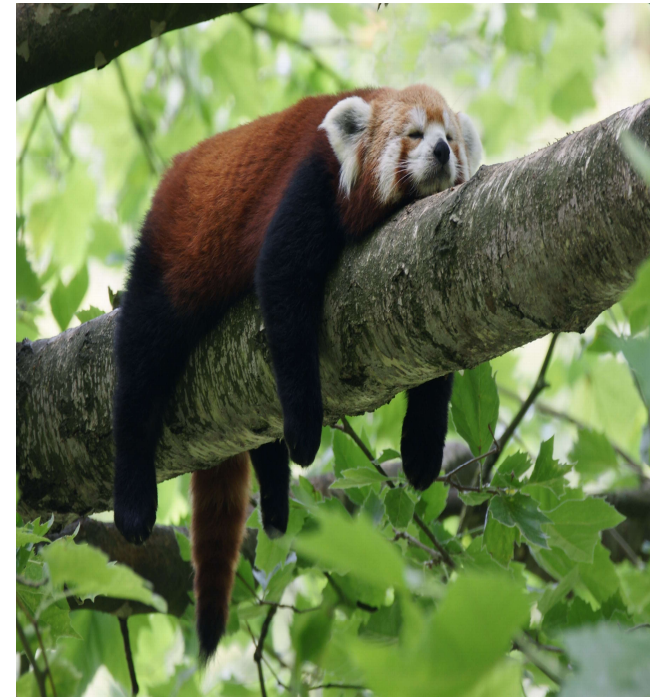
- Orthostatic symptoms
 - a) No orthostatic hypotension
 - b) The primary symptom is **lightheadedness or fainting**.
 - c) Increase in heart rate
 - 30 beats per minute or more when standing for more than 30 seconds, or 40 beats per minute or more in those aged 12–19 years
 - > 120 beats per minute when already stand.



Post-COVID and Autonomic Dysfunction

- *“Any time I rise or change position, my heart rate goes really high, 140 usually, and then my blood pressure drops...every time I stand up, every time I get moving. And then it causes dizziness, nausea, all those fun symptoms.”*

(2022 SK Focus Group Participant)



Post-COVID Condition in children and adolescents



Picture – Stock images Microsoft PowerPoint

- Inability to tolerate strenuous activity, anxiety or tightness in the chest, difficulty breathing and difficulty thinking or "brain fog".
- Younger – hair loss, weight loss, altered sense of smell or taste.
- Tend to recover faster but can last for over 6 months
- Severity of initial infection and other underlying conditions

Signs to look for

- Cannot keep up with schoolwork or sports.
- Feeling tired, sore muscles, feeling dizzy
- Short of breath with minimal activities

Summary

- Post-COVID Condition refers to the presence of symptoms 12 weeks or more after an infection with COVID-19
- About 15% of people can experience symptoms after a COVID-19 infection
- Almost half of those with persistent symptoms experience them for a year or longer
- While many types of PCC symptoms are possible, the most common are fatigue, SOB, sleep problems, and neuropsychiatric (headaches and mental health issues and cognitive problems)



Question & Answer Period

- Please note that this part of the session is also **recorded**
- Learners can submit **written questions** through **Q&A** (anonymously, if desired) or **chat** (addressed to "everyone")

or

- Learners can **raise their hand** and **unmute** to ask a question

Initial Feedback

- **To what extent did this session:**
 - Improve your knowledge about symptoms associated with Post-COVID Condition?
- **Please provide further feedback through the survey link!**
 - <https://www.surveymonkey.ca/r/NFSXRZB>

Thank you for attending!

- **Recording & Presentation PDF:** Will be available on CME's website within a week after the event (https://cmelearning.usask.ca/specialized-programs/post-covid-condition/about_post-covid-condition-overview/pcc_past_events.php/)
- **Next session:** A date has not been selected for the next session in ***CME's Post-COVID Condition Spring 2023 Webinar Series***. However, it will likely be in June. Once confirmed, the details will be announced on CME's social media channels and website: https://cmelearning.usask.ca/specialized-programs/post-covid-condition/about_post-covid-condition-overview/pcc_events.php

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