Post COVID-19: Neurocognitive Symptoms and Rehabilitation

Project ECHO

BC ECHO for Post-COVID-19 Recovery

Physical Medicine and Rehabilitation

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Accredited by UBC CPD

UBC CONTINUING PROFESSIONAL DEVELOPMENT FACULTY OF MEDICINE

BRITISH COLUMBIA doctors of bc SharedCare Partners for Patients DEPARTMENT OF FAMILY MEDICINE Leaders in primary care, champions of community health

Disclosures

- Dr. Yao – Nothing to declare
- Dr. Kwong – Nothing to declare

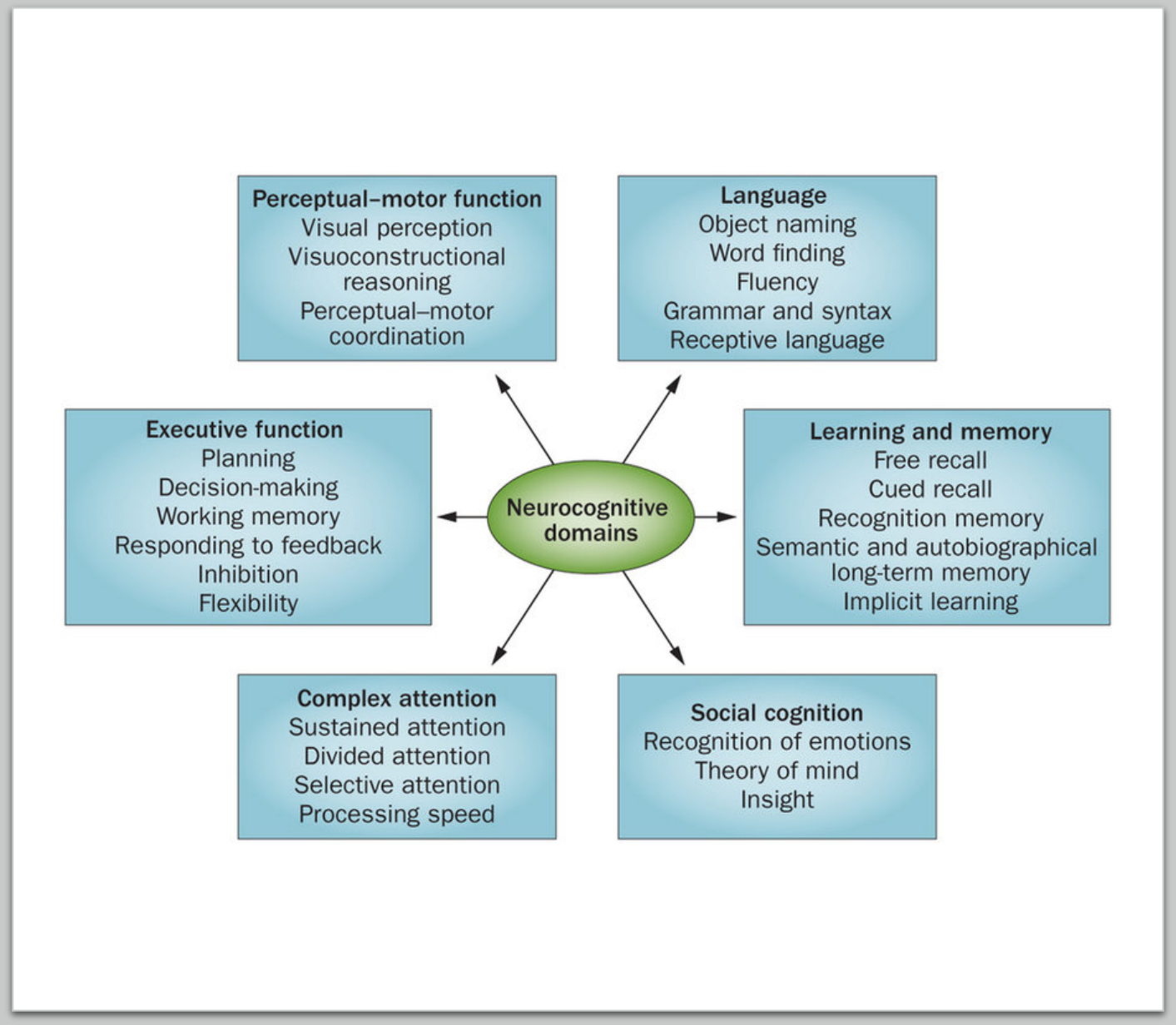
Objectives

- Describe the neurocognitive sequelae of COVID-19
- Apply functional cognitive rehabilitation and treatment approaches to their clinical practice
- Understand the multidisciplinary approach to care that utilizes neuro-rehabilitation trained allied health professionals and when to refer patients to these services
- Discuss access to rehabilitation tools and resources to facilitate more effective clinical visits and optimize patient outcomes

Neurocognition

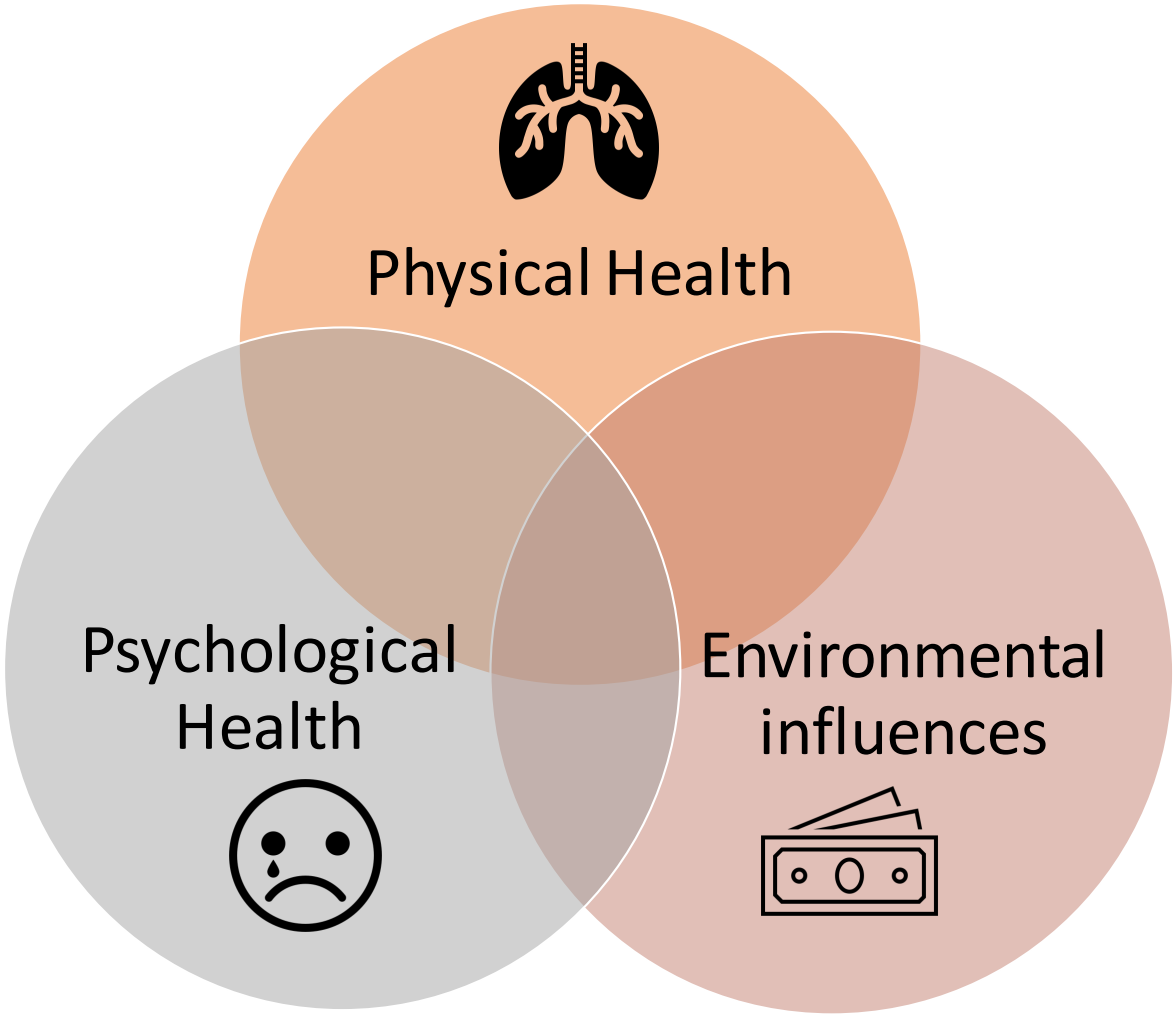
"Cognitive processes or functioning understood in relation to the specific neural mechanisms by which they occur in the brain and any impairment of these mechanisms" – American Psychological Association

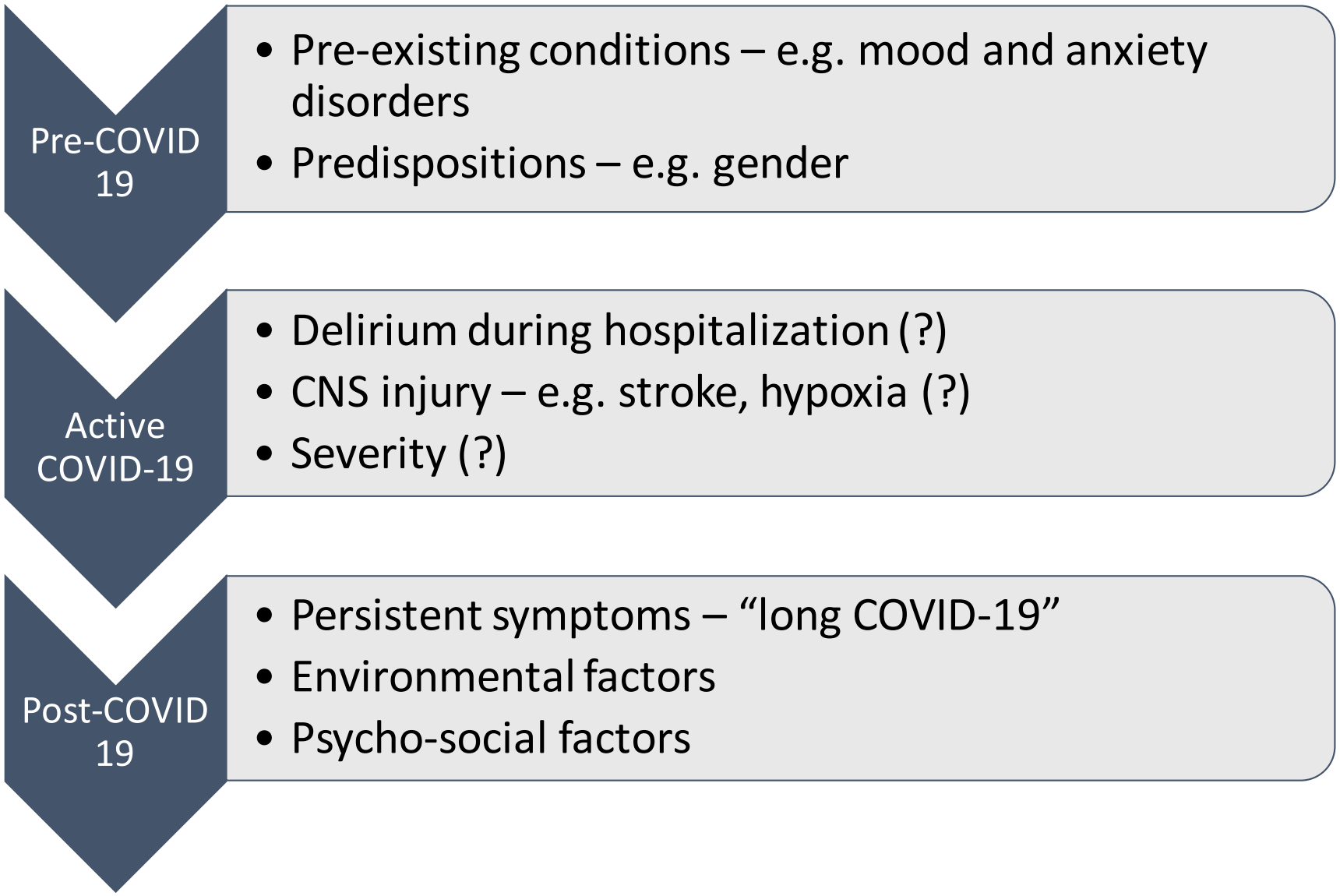
- 6 domains defined by DSM 5



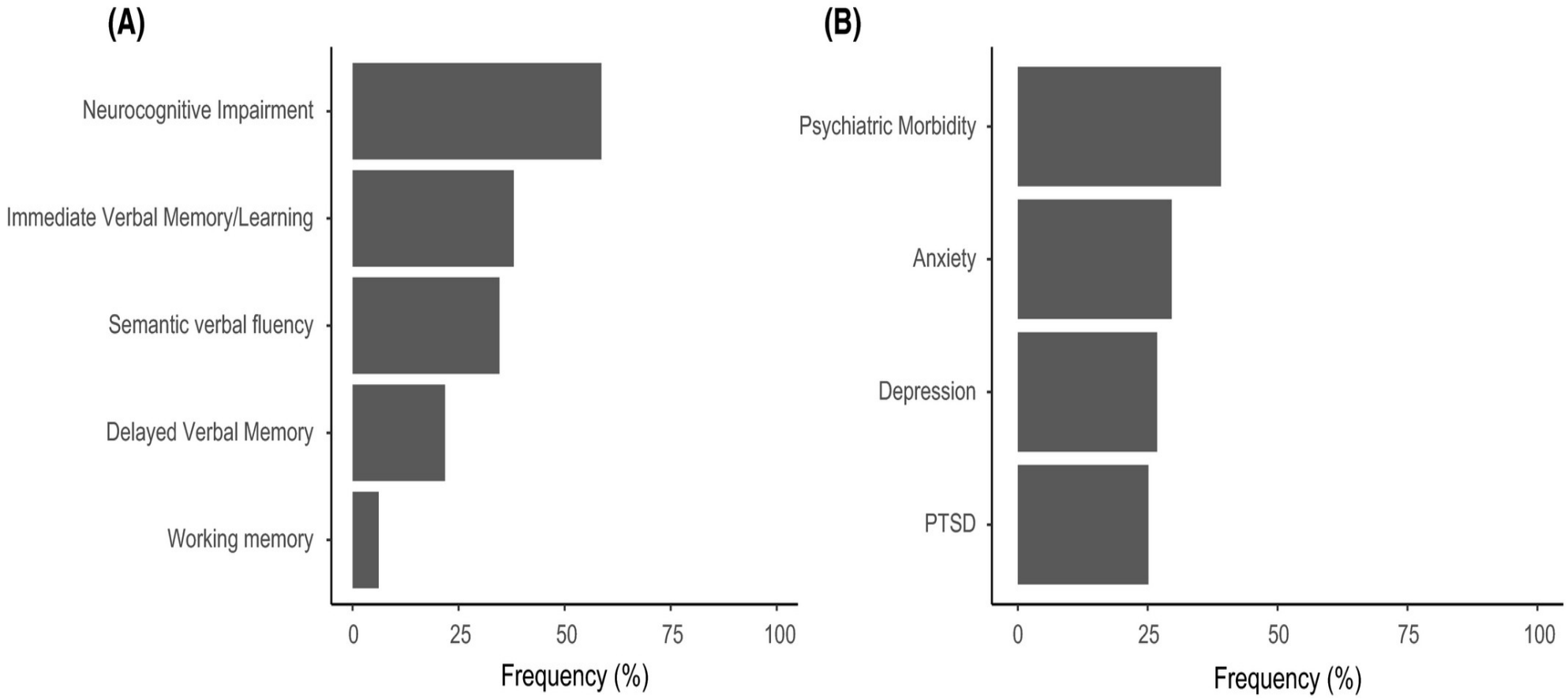
Common Post COVID-19 Neurocognitive Symptoms

- Attention and concentration deficits
- Short term memory deficits
- Verbal / word fluency deficits
- “Brain Fog” – slow processing
- Fatigue
- Sleep disturbances – insomnia / hypersomnia
- Mood swings – irritability, low frustration tolerance
- Lack of motivation / drive
- Sensory hypersensitivities (light or sound)


Physical Health
Psychological Health
Environmental influences


Pre-COVID 19
• Pre-existing conditions – e.g. mood and anxiety disorders
• Predispositions – e.g. gender
Active COVID-19
• Delirium during hospitalization (?)
• CNS injury – e.g. stroke, hypoxia (?)
• Severity (?)
Post-COVID 19
• Persistent symptoms – “long COVID-19”
• Environmental factors
• Psycho-social factors

Short-term neuropsychiatric outcomes and quality of life in COVID-19 survivors. (R.Mendez et. al.)



Journal of Internal Medicine, Volume: 290, Issue: 3, Pages: 621-631, First published: 03 February 2021, DOI: (10.1111/joim.13262)

General Approach to Cognitive Rehabilitation

- Education – for patients and family / care givers
- Identify areas for focused intervention
- Provide self management strategies and support
- Opportunities to simulate cognitive demands in controlled manner
- Gradual exposure and building tolerance
- Counseling, Cognitive Behavioral Therapy
- Medical treatment of underlying mood, anxiety, sleep, or other medical conditions that impact function
- Refer to specialists as appropriate
- Regular and timely follow up

Why do I have these issues?

There are many complex reasons related to physical health, psychological health, and environmental factors

After hearing the story and doing the examination, we can talk further about the next steps

Will I get better?

Most studies show that people improve with time

This includes symptoms such as fatigue, sleep disturbance, cognitive issues

TABLE 1 | Percentage of COVID-19 patients showing neuropsychiatric and cognitive effects.

	Reference	COVID-19 patients showing neuropsychiatric and cognitive effects							
		CNS[1]	**PNS[2]**	**Affective disorders**	**Anxiety**	**Fatigue**	**PTSD**	**Impaired attention**	**Impaired memory**
Short-term	Bo et al., 2020						96%		
	Crunfli et al., 2020			20%	28%			45%	28%
	Lu et al., 2020	25%	35%[a]	42%		27%			13%
	Mao et al., 2020	53%	19%						
	Mirfazeli et al., 2020	40%	36%[b]						
	Varatharaj et al., 2020	62%		17%					26%
	Zhang et al., 2020			29%					
Long-term	Hampshire et al., 2020							0.57SD[c]	
	Lu et al., 2020	10%	22%	17%		7%			28%
	Woo et al., 2020			11%		17%		44%	50%

[1]*Central nervous system (CNS) includes dizziness, headaches, mental state, ataxia, seizure, and acute cerebrovascular disease.*

[2]*Peripheral nervous system (PNS) includes an impaired sense of smell, taste, vision, and nerve pain.*

[a]*A count of PNS symptoms occurring, it is possible a single patient had multiple symptoms.*

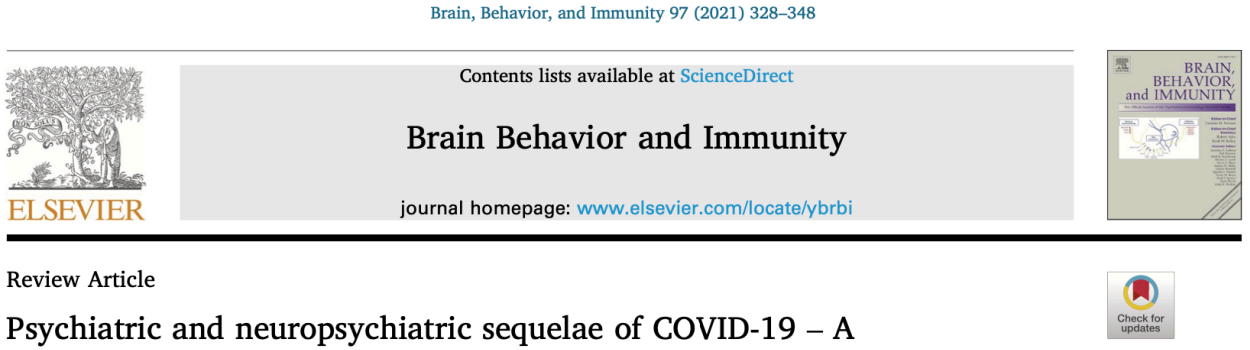
[b]*Average of reported PNS symptoms.*

[C]*Significant SD away from the healthy control group, indicating cognitive impairments for groups with different levels of medical assistance, the value here is the SD for patients requiring hospitalization with a ventilator.*

Kumar et al., 2021 - https://doi.org/10.3389/fpsyg.2021.577529

Systematic Review

- 66 studies included
  - Anxiety/depression
  - Post-traumatic stress disorder
  - Cognitive deficits
  - Fatigue
  - Sleep disturbances



Brain, Behavior, and Immunity 97 (2021) 328–348

Contents lists available at ScienceDirect

Brain Behavior and Immunity

journal homepage: www.elsevier.com/locate/ybrbi

Review Article

Psychiatric and neuropsychiatric sequelae of COVID-19 – A systematic review

Thor Mertz Schou [a], Samia Joca [b], Gregers Wegener [a], Cecilie Bay-Richter [a,*]

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Schou et al., 2021 - https://doi.org/10.1016/j.bbi.2021.07.018

Is there a workbook I can go through?

Let us first better understand what the specific cognitive issues are

We will also need to understand what tasks you need to do for ___ (home, work, recreational, etc.)

General Goals of Cognitive Rehabilitation

Problem orientation, awareness, and goal setting

Compensation

Internalization

Generalization

Ref: ACRM Cognitive Rehabilitation Manual

Awareness? Excerpt from patient portal: “How is this problem limiting my function?”

- “I continue to lose focus at work and in meetings”
- “Impossible to maintain active health lifestyle that I was used to. No longer able to participate in activities with wife and kids. Struggle with stamina for work.”
- “…I am not confident I will be able to succeed with my cognitive impairments…It feels like the productive member of society is gone.”
- “I can't work, I can't take proper care of my children, I can't drive, I can't do anything without getting symptoms and feeling drained. Getting breathless after any activity."

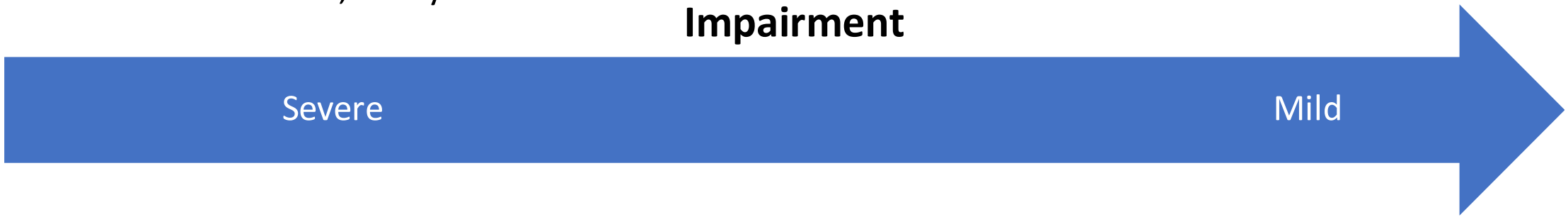
Strategies

External strategies

- External to the patient
- Compensation, aids to assist
- Examples
  - Structured notebooks, planning systems
  - Task-specific aids
    - Calendars, sticky notes

Internal strategies

- Self-generated procedure
- Enhance conscious control
- Self-cuing with image, word, or action sequence



Ref: ACRM Cognitive Rehabilitation Manual

What “category” might COVID survivors with cognitive issues fall into?

- Hypothesis based upon clinical encounters
  - Mid to high self-awareness
  - Decreased attention, memory, processing speed

  - In search for way to improve
  - Global long-term goals and plans
  - Limited ability to breaking down long-term goals into short-term goals

  - Many demands at home, at work, recreationally

Case of training the trainer

- Mr. Trainer is a 52yo, otherwise healthy, independent, working as a personal trainer, manager
- Exercise 5 days/week, including weights, aerobic, high-intensity training
- COVID-19 positive Jan 2021, non-hospitalized
- Symptoms: shortness of breath, headaches, brain-fog
- Activities: physical activity, Excel data entry, cooking
- Course: Physically improving
- Issue: “He is looking for a similar type of training routine for his brain, as he is used to setting goals and progressing exercises physically.”

Progressive overload cognitively?

- In search of a way to “practice” e.g. a Grade 11 textbook to go through

- Physical exercise prescriptions may involve parameters such as type, intensity, duration, frequency, volume, progression. Is there anything like that with cognitive rehabilitation?

Attention – what is it?

Sustained Attention

- Data entry
- Cooking one dish

Alternating attention

- Data entry and interrupted by phone calls, e-mails
- Cooking + child care

Selective Attention

- Data entry, with music in the office, and construction noises outside the window
- Cooking with streaming TV program on

Divided Attention

- Data entry using complex software program with many buttons to use
- Cooking 5-course meal with simultaneous tasks, timing, etc.

Adapted from ACRM Cognitive Rehabilitation Manual, with original source from Sohlberg et al., 2001

How to use the framework of attention?

- Education with the patient about the different types of attention, in relation to their tasks

- E.g. with Mr. Trainer “Transferring numbers on a table in excel”
  - Type of activity: Data-entry
  - Attention needed: Sustained
  - Problem: 10 min resulted in “headache, brain fog”, needed to rest 30min

- E.g. with “Multi-task doing some cooking”
  - Type: Cooking
  - Attention needed: Divided attention
  - Problem: Difficult to make sure all of the food is ready at the same time

Suggestions for Mr. Trainer

- PHSA website to review first, symptom journaling
- Was to see Occupational therapist as well
- Follow-up appointment pending

Next appointment:

- Start further education about attention
- Broadly, start with simple to complex
- Break down tasks needed
- Consider role for any attention-training, vs. task-specific training

Case example: Steve

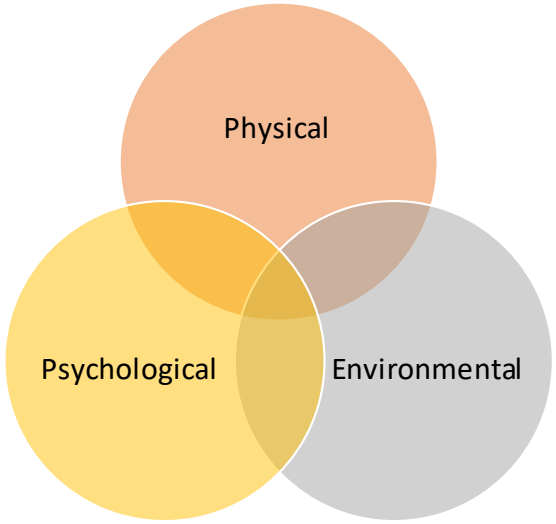
- 55 yo man – prev. independent. Hx of mild HTN.
- Tested +ve for COVID-19 3 months ago
- Was in hospital for 5 days – no ICU stay
- Since being home, he has struggled with the following symptoms:
  - Fatigue
  - Poor sleep – long latency and interrupted sleep
  - Short term memory impairment
  - Slower thinking
  - Difficulty concentrating – can't work on computer for > 20 min
  - Reduced exercise tolerance and SOB with exertion
  - Irritability and frustration

Listen Actively

- What are the most prominent and disruptive symptoms?
- What have they tried?
- What are they not saying?

Impact of symptoms on Steve

- Not able to return to work as a landscaper
- Relationship stress with family – wife and teenage kids
- Social isolation
- Increased financial pressures
- Worries about not being able to recover and uncertain future



First Steps

VALIDATE

- What you are experiencing is real;
- You are not alone
- I can see how much worry this is causing you

FOCUS

- What are the top 2 or 3 symptoms that are most bothersome?
- If you can fix one symptom, what would it be?

EMPOWER

- Many symptoms are interrelated and feed into each other
- It will take some trial and error, but there are strategies you can use to improve your symptoms

Start with the BIG THREE

- Sleep (Fatigue)
- Mood (Depression, anxiety, irritability)
- Physical pain
- Secondary things to work on:
  - Memory
  - Attention and concentration
  - “Brain Fog”
  - Sensory sensitivities

Sleep

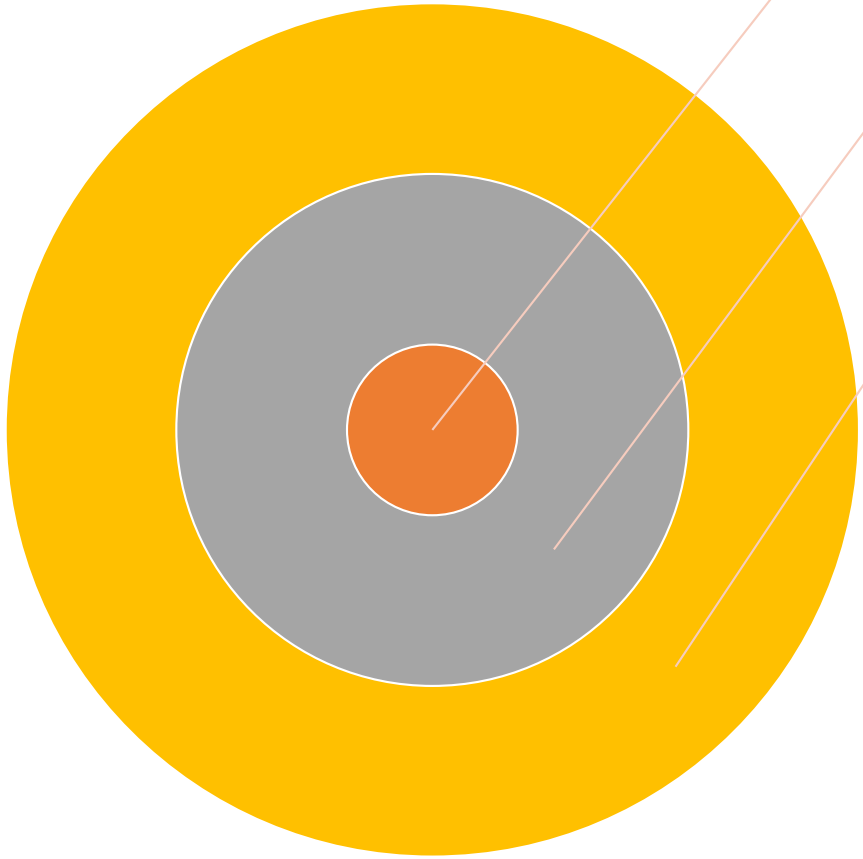
- Long sleep latency – what can we improve?
  - Sleep hygiene – set sleep and awakening times
  - Anxiety / rumination
  - Sleep environment
- Early awakening
  - Concept of “sleep debt” or sleep restriction
  - Limit daytime naps (max 30 min)
  - Eliminate alcohol – especially at night
  - Cognitive behavioral therapy for insomnia (CBT-I)
- Encourage daily exercise as tolerated
- Rule out sleep disordered breathing
- Medications – consider “2 for 1’s”

Brain Fog

- Many features:
  - Poor concentration
  - Poor memory / retrieval
  - Poor multi-tasking
  - Slow processing /response time
  - May be associated with fatigue (physical and cognitive)
  - May be associated with depression

- Start with just 1-2 things
- Discourage multi-tasking
- Cut yourself some slack – expect fluctuations and lapses, not perfection

Energy/Activity Zones



Comfort Zone

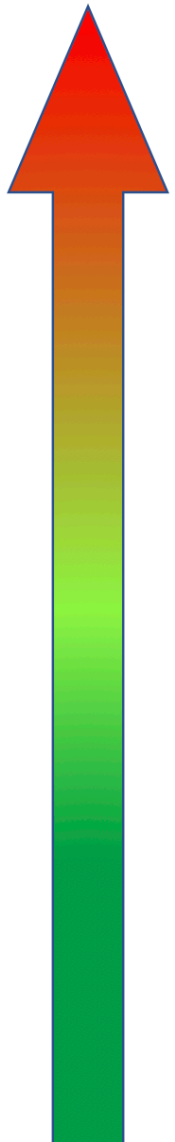
Therapeutic Zone

Over-doing-it Zone

Name:_____

Post-COVID-19
Interdisciplinary Clinical Care Network

LIVING IN YOUR ENERGY ZONE



ENERGY DEMAND	Physical	Chores/Work	Cognitive (Thinking)	Emotional/Social/Spiritual
10	Aerobic exercise: Step ups, Running, high resistance Exercise bike/Fast road bicycle, cross trainer, roller blades (per half hour)	Building, constructing, large surface painting (per hour)	Detailed calculations, accurate form-filling, major decision-making (per hour)	Socializing, large group, 6 people or greater (per half hour)
9			Reading a book or a report that is complex (per hour)	Anxiety/worrying-most of the day
8	Jogging in water, swimming, moderate effort bicycling (per half hour)	Work: Millwork, Forestry (per hour)	Answering emails (per hour)	Frustration/Anger (per episode/or per half hour)
		Planning Meals (per hour)	Paying bills, day to day finances (per hour)	
7	Rowing machine, Walking hills, jogging, canoing (per half hour)	Lifting and carrying groceries or household items (per hour)	Attending appointments (per hour)	Attending church or religious services (per hour)
	Driving a car on a routine route (per hour)		Driving a car on a routine route (per hour)	Child care active, playing games (per hour)
6	Slow/light bicycling, moderate effort weight-lifting (per half hour)	Home repair-sawing wood (per hour)	Reading a book that is less complex (per hour)	Anxiety/worrying (per hour)
	Sexual activity of higher effort (per hour)	Home repair-washing fence, painting outside (per hour)	Tutoring children in studies (per hour)	
		Landscaping-planting trees (per hour)		Social media (per hour)
5		Home repair-painting, stacking wood, mowing lawn, gardening, pruning (per hour)	Attending a doctor's appointment/dental appointment (per hour)	Disturbed sleep (per night)
		Work: Farm tasks (per hour)	Screen time paying attention to TV, computer, cell phone screens (per hour)	Attending full church/religious services (per hour)
			Working on the computer (per hour)	
4	Water aerobics, dancing (per half hour)	Multiple household tasks, heavy cleaning, vacuuming, mopping (per hour)	Typing, computer keyboard work (per hour)	Time on social media (per hour)

http://www.phsa.ca/health-info-site/Documents/post_covid-19-Living_in_your_Energy_Envelope_Tool.pdf

Fatigue / Energy Management – 3P's

- PLAN: When am I going to do it?
  - ❑Plan out your week and distribute heavy tasks throughout
  - ❑Do challenging activities when you have the most energy
  - ❑Alternate heavy vs. light tasks and thinking vs. doing tasks
  - ❑Include activities in your day that bring you joy and "recharge" your energy bank
- PACE: How am I going to do it?
  - ❑Allow ample time for an activity – do not rush
  - ❑Have sufficient rest after task completion
  - ❑Take frequent brain breaks during the activity vs. one long break at the end
- PRIORITIZE: What am I going to do?
  - ❑Make a list – what needs to be done today? What can wait?
  - ❑Do most important task first
  - ❑Accept that not everything can get done
  - ❑Delegate tasks to others who offer to help

Case: Steve – 20 min screen tolerance

- Gradual return to easy activities first – e.g. just personal emails
- Start with short periods and take breaks - e.g. 5-10 min break after the first 10 min before doing another 10 min
- Modify the task to make it easier
- Aim for the ”therapeutic zone” – use your symptoms as a guide
- Consider the overall amount of activity for each day and week, not just each individual activity
- Gradually increase the frequency, duration, and intensity of activities

Self-Management Action Plan

SELF-MANAGEMENT STRATEGIES WEEKLY ACTION PLAN

1. The self-management strategy I WANT to try this week is:
   _____

2. Describe the steps I will take:
   WHEN _____
   WHERE _____
   HOW OFTEN _____

3. Barriers: What might get in the way of your plan?
   _____
   _____
   _____

4. Plans to overcome barriers: What could you do to handle these barriers?
   _____
   _____
   _____

5. Importance _____ and Confidence _____ ratings (1-10)
   How important is the plan to you on a scale of 1-10?
   How confident are you than you complete the entire action plan on a 1-10 scale?

Self-evaluation: How did it go? Do I want to carry this plan forward? Could I make any adjustments?

Remember to keep goals SMART!
S – Specific
M – Measurable
A – Achieveable
R – Realistic
T - Timely

Next steps in the journey

Follow up	Need to have timely follow up – can be virtual or a phone call (Physician as coach)
Expectations	Expect some “set backs” This journey will take time – months, not weeks
Celebrate	Celebrate successes - even small ones
Don’t judge	Meet the patient where they are in terms of readiness and ability, and work from there

Multi-disciplinary Approach

Physicians have limited time and resources – you need a team approach

Occupational therapy

- Helps with activity planning and education
- Often have strategies on pacing, goal setting

Psychology / neuro-psychology

- Provide CBT (cognitive behavioural therapy) strategies
- Help patient address mood, anxiety, and stress management issues

Physiotherapy

- Develop exercise plans with gradual increases

Social work

- Helps explore benefits and available financial assistances
- First line in counseling with patient and families

Vocational rehabilitation

- Advise on work benefits, accommodations
- Plan graduated return to work when ready

Access to other health providers

- Extended health funding for private services e.g. physio, psychology
- Employer benefit programs e.g. EFAP
- Community OT, PT, SW – available in some models of care
- Rehabilitation centres – usually for those with more severe symptoms and have no resources elsewhere (expect long waitlists)
- WorkSafe – if applicable
- Post-COVID 19 clinics – limited resources under development

Post-COVID-19 Care & Recovery

http://www.phsa.ca/health-info/post-covid-19-care-recovery

Support your understanding and management of symptoms as you recover from COVID-19.

Most people with COVID-19 recover within two weeks. But, some people with more severe symptoms can take twelve weeks or more to feel better.

This page includes fact sheets, links to external websites and other material that may support your understanding and management of your COVID-19 recovery.

Symptom management fact sheets +

Tools for managing symptoms −

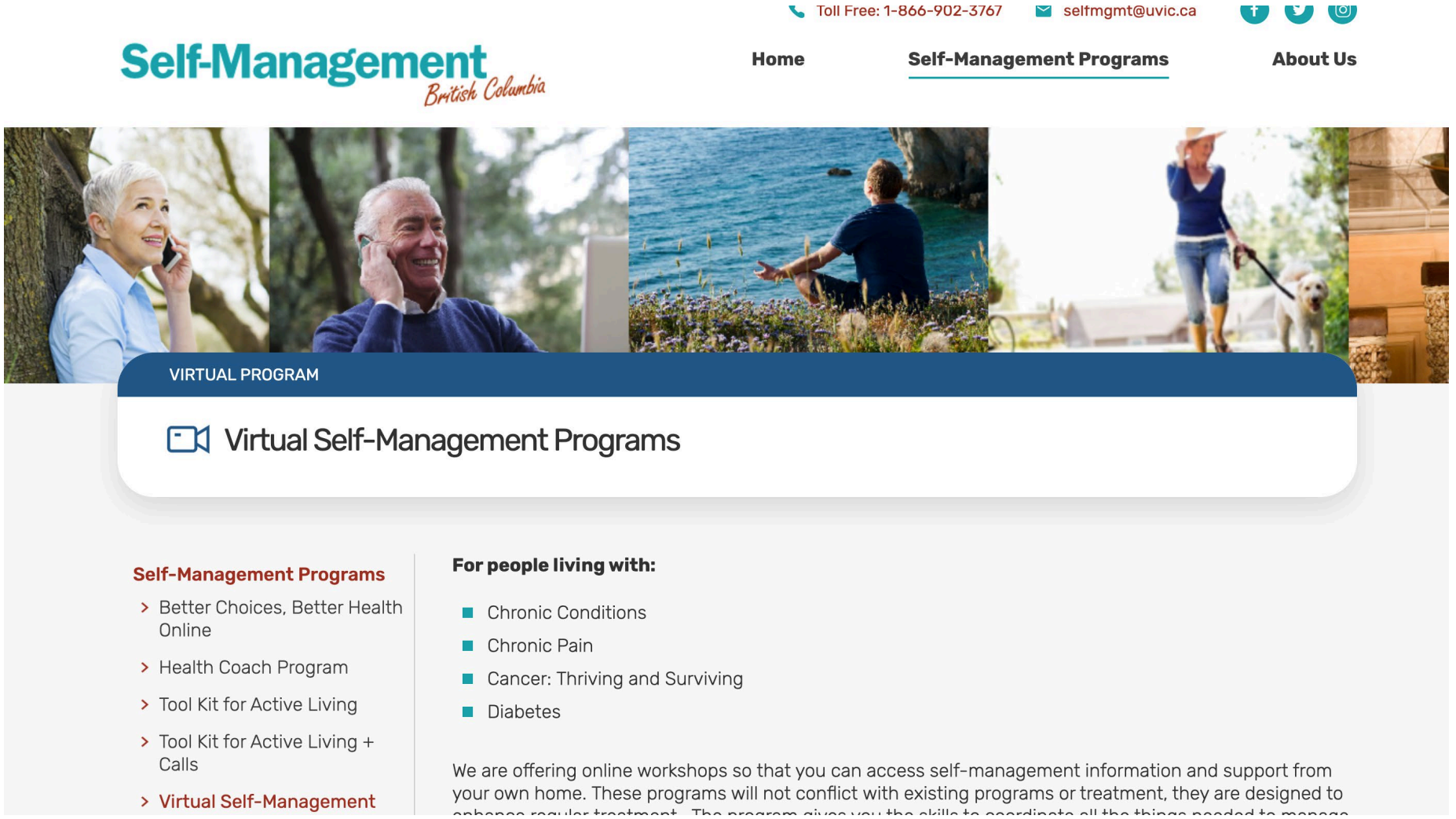
Living In Your Energy Envelope

- Introduction to Living in your Energy Envelope Tool
- Living in your Energy Envelope Tool

Quick links

- Post-COVID-19 recovery clinics >
- Post-COVID-19 clinical care resources >
- BCCDC COVID-19 health info >

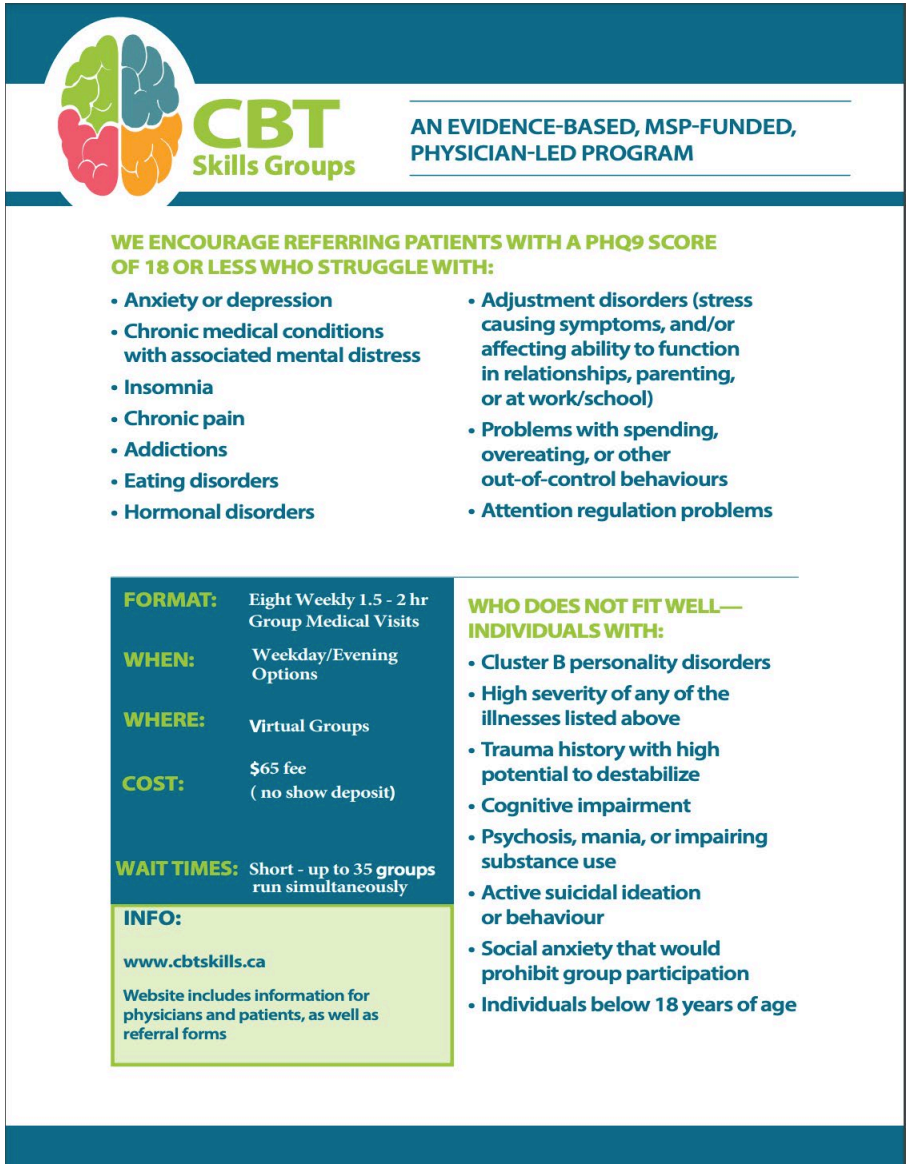
Self-Management BC https://www.selfmanagementbc.ca/virtualself-managementprograms



Cognitive Behavior Therapy Skills Group

https://cbtskills.ca/physicians/

- Physician led CBT group
- 8 week program for adults
- Patients can sign-up on their own or be referred by MD
- Need to have computer with camera and virtual capabilities
- Integrates psychoeducation, CBT and mindfulness practices
- $65 no-show deposit



Questions?