HEADS UP WEBINAR SERIES

Post-COVID:
Long Hauler Symptoms & Rehabilitation

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Disclosures

Gabrielle Rapisarda, M.S., CCC-SLP CBIS – Nothing to disclose

Gabrielle Fregeau, PT, DPT – Nothing to disclose

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Objectives

1. Describe symptoms of LONG COVID
2. Identify key interdisciplinary team members to help optimize patient outcomes
3. Recognize the typical symptoms associated with Post-COVID-19 syndrome and implement evaluation and treatment approaches
4. Incorporate the patient perspective into service delivery by reviewing a case study

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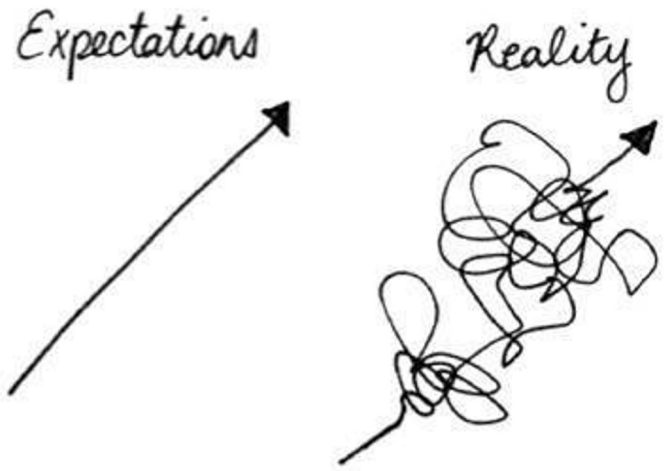
What is LONG COVID

A condition that "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 that last for at least 2 months and cannot be explained by an alternative diagnosis."

- World Health Organization



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Symptoms of Long Covid

- Brain Fog
- Fatigue
- Post-exertional malaise
- Dyspnea
- Nerve pain
- Neuropathy
- Tachycardia, chest pain and chest tightness
- Nausea and ongoing GI issues
- Loss of taste and smell or distortion of taste and smell
- Insomnia
- Joint and Muscle pain
- Dysautonomia
- Headaches
- Anxiety and depression
- Fever

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Demographics

- Mean age is **43**
- **86%** female
- **77%** white

- **95%** have at least a Bachelor's Degree
  - *70% have a Master's, PhD, JD or MD*

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Premorbid Conditions

Most common premorbid conditions prior to Post-COVID syndrome:

- **Depression/anxiety**: **42%**
- **Autoimmune disease**: **16%**
- **Insomnia**: **16%**
- **Lung disease**: **16%**
- **Headache**: **14%**

Premorbid depression/anxiety suggest a possible neuropsychiatric vulnerability to becoming a 'long hauler'

(Graham et al., 2020).

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Multidisciplinary Team

Occupational Therapy

- ADLs/IADLs
- Energy conservation
- Visual therapy
- Strengthening of UE
- Fine motor coordination training
- Address cognitive impairments
- Utilizing task specific training with monitoring vitals

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Physical Therapy

- Progressive strengthening
- Progressive endurance training
- Orthopedic issues and pain complaints
- Address postural deficits and tightness
- Address falls risk
- Dual-task training
- Address falls risk
- Monitor response to exercise

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Speech Therapy

"The goal for SLP engagement is to enable individuals to restore the the fullest extent possible, their premorbid cognitive-communicative functioning in order to resume their participation in personal, professional and community activities."

(Mashima et al., 2021)

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Physician Partners

Multidisciplinary COVID Clinic:

- Internal medicine
- Physical Medicine and Rehab
- Geriatrics and Palliative Medicine
- Neurology
- Neuropsychology
- Pulmonology
- Cardiology
- Infectious Disease

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Recovery Patterns

Time after COVID-19 may not be a good predictor of improvement towards baseline and each individual may have a different recovery trajectory

(Graham et al., 2020)

Trajectory: unpredictable, episodic, relapse-remitting nature

(Twomey et al., 2021)

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Evaluation: ICD-10 Codes

✓ Current:

U09.9: Post-COVID-19 condition, unspecified

✗ Outdated:

B94.8: Sequelae of other specified infectious and parasitic diseases

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Evaluation: Case Hx Intake

Two clinical evaluation tools to promote self-efficacy and resilience

Motivational Interviewing

(Miller & Rollnick, 2012)

- ➔ Understanding the motivation of the patient
- ➔ Listen empathetically
- ➔ Provide empowerment for the patient to make changes
- ➔ Utilize open-ended questions (Assess their level of knowledge regarding POST COVID Syndrome)

Collaborative goal setting

(Sohlberg & Mateer)

- ➔ Engage with the patient in order to generate personalized meaningful goals that will make a positive impact on their everyday lives.

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Evaluation

Informal Measures

- ASHA NOMS COG
- Neuro-QOL
- PROMIS Cognitive Function
- Modified Fatigue Impact Scale
- Multifactorial memory Questionnaire
- Behavior Rating Inventory of Executive Function
- Communicative Participation Item Bank
- La Trobe communication Questionnaire
- Breathing Questionnaire

Formal Measures

- **RBANS**
- **FAVRES**
- **CLQT**

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APTA COVID-19 Core Measures

Quality of life

Patient-Reported Outcomes Measurement Information Systems

Strength

Medical Research Council Sum Score

Function

Short Physical Performance Battery

Endurance

2-Minute Step Test

Cognition

Saint Louis University Mental Status Examination

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Frequency Framework

Level of Impairment	Frequency of Visits	Duration of Treatment
Functioning 0-25% (severe)	2x/week @ 30 - 60 minutes	12 - 16 weeks
Functioning 26-49%	1-2x/week @ 30-60 minutes	10 - 12 weeks
Functioning 50-75% (moderate)	1-2x/week @ 30-60 minutes	8 - 10 weeks
Functioning 76-90%	1x/week @ 30-60 minutes	6 weeks
Functioning 91-100% (high-functioning)	1x/week @ 30-60 mins	4 weeks

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Intervention

Dynamic Coaching

(Ylvisaker and Holland, 1985)

Meta-Cognitive Training/Education

- Managing cognitive fatigue and cognitive deficits with use of strategies
- Contextualized, person-centered practice

(Kennedy, 2017; Sohlberg & Turkstra 2011; Macdonald & Wiseman-Hakes, 2010)

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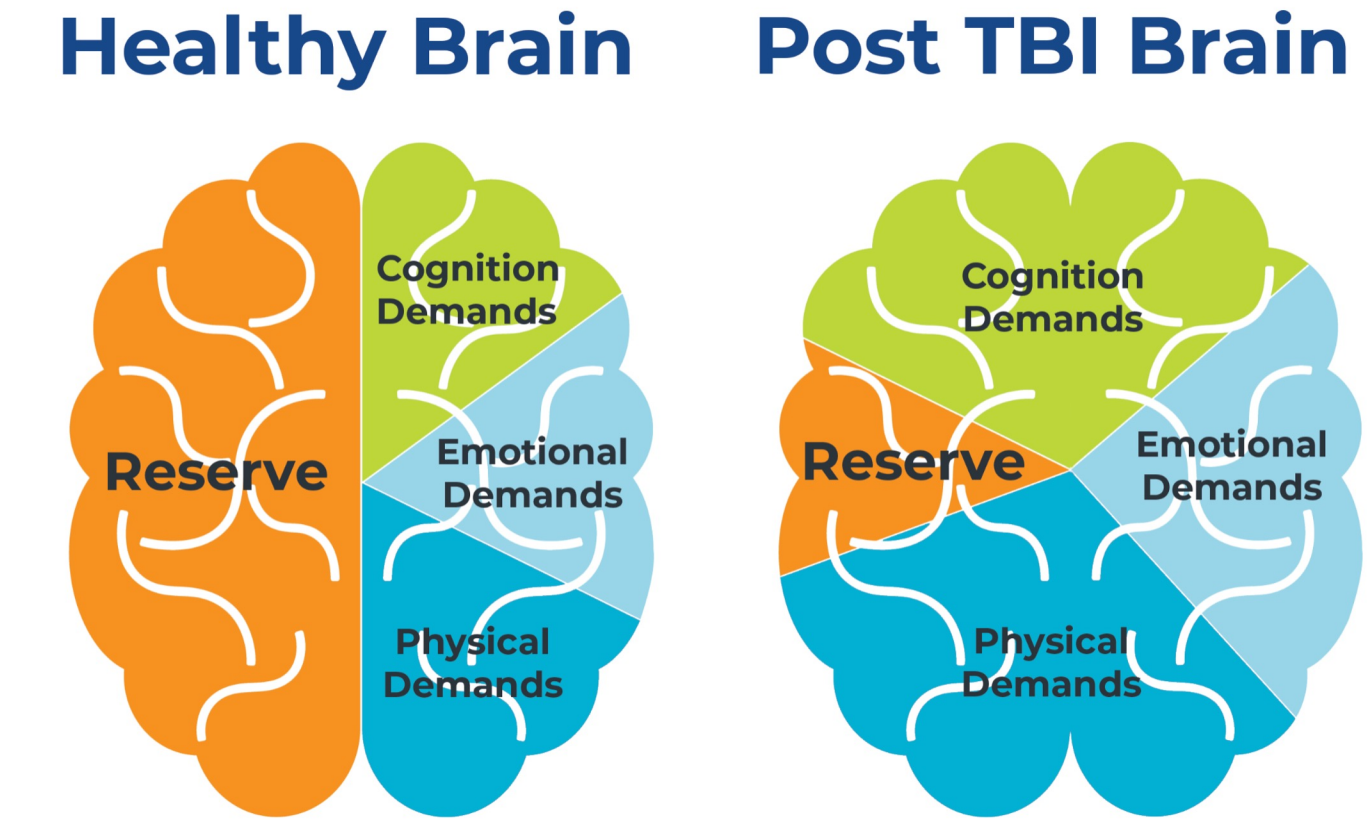
Cognitive Fatigue Treatment: "Energy Pie"



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Cognitive Fatigue Treatment: Spoon Theory

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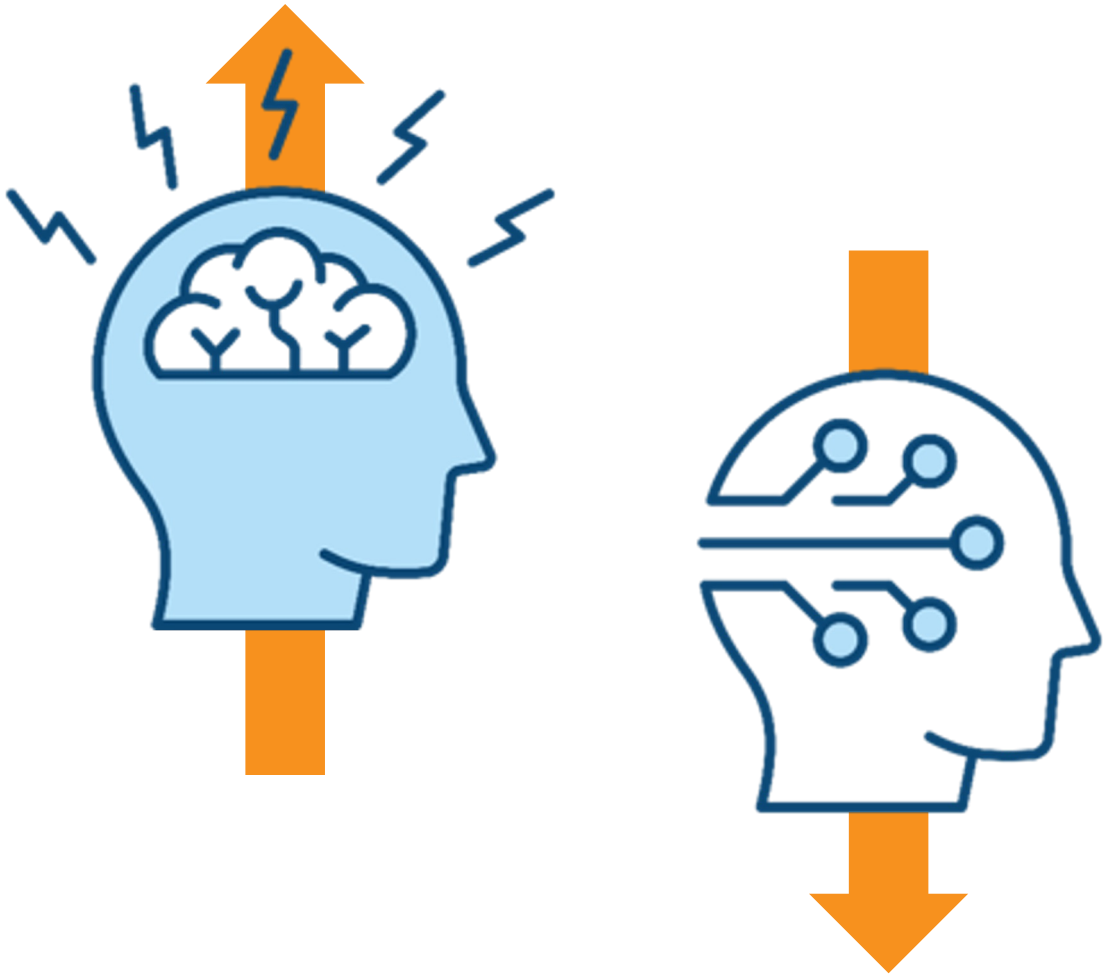
Relationship Between Stress and Cognition



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Cognitive Treatment

Compensatory Strategies to Target

Executive Functioning

Attention

Word finding

Memory

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Considerations for Physical Activity

1. **Systems Review**
   - Cardiopulmonary system
   - Exertional oxygen desaturation
   - Autonomic dysfunction
   - Post-exertional symptom exacerbation

2. **Educate on energy conservation and pacing**

3. **Be cautious with exercise prescription**

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Autonomic Dysfunction

Potential symptoms

Screening

- Orthostatic vitals
- Compass-31

Treatment

- Hydration
- Recumbent or supine exercise
- Isometric exercise
- Compression garments
- Slow transitions
- Patient education
- Autonomic Conditioning Therapy

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Return to Activity

Mild fatigue

- Slow return to high-intensity activities
- Rule of Tens

Moderate fatigue

- Activity or aerobic exercise at RPE 9-11 (Very Light to Light)

Severe fatigue

- Upper body and lower body stretching and light strengthening
- Progress to aerobic exercise at RPE 7-9 (Extremely to Very Light)

Borg RPE Scale		
6		How you feel when lying in bed or sitting in a chair relaxed. Little or no effort.
7	Very, very light	
8		
9	Very light	
10		
11	Fairly light	
12		Target range: How you should feel with exercise or activity.
13	Somewhat hard	
14		
15	Hard	
16		
17	Very hard	How you felt with the hardest work you have ever done.
18		
19	Very, very hard	
20	Maximum exertion	Don't work this hard!

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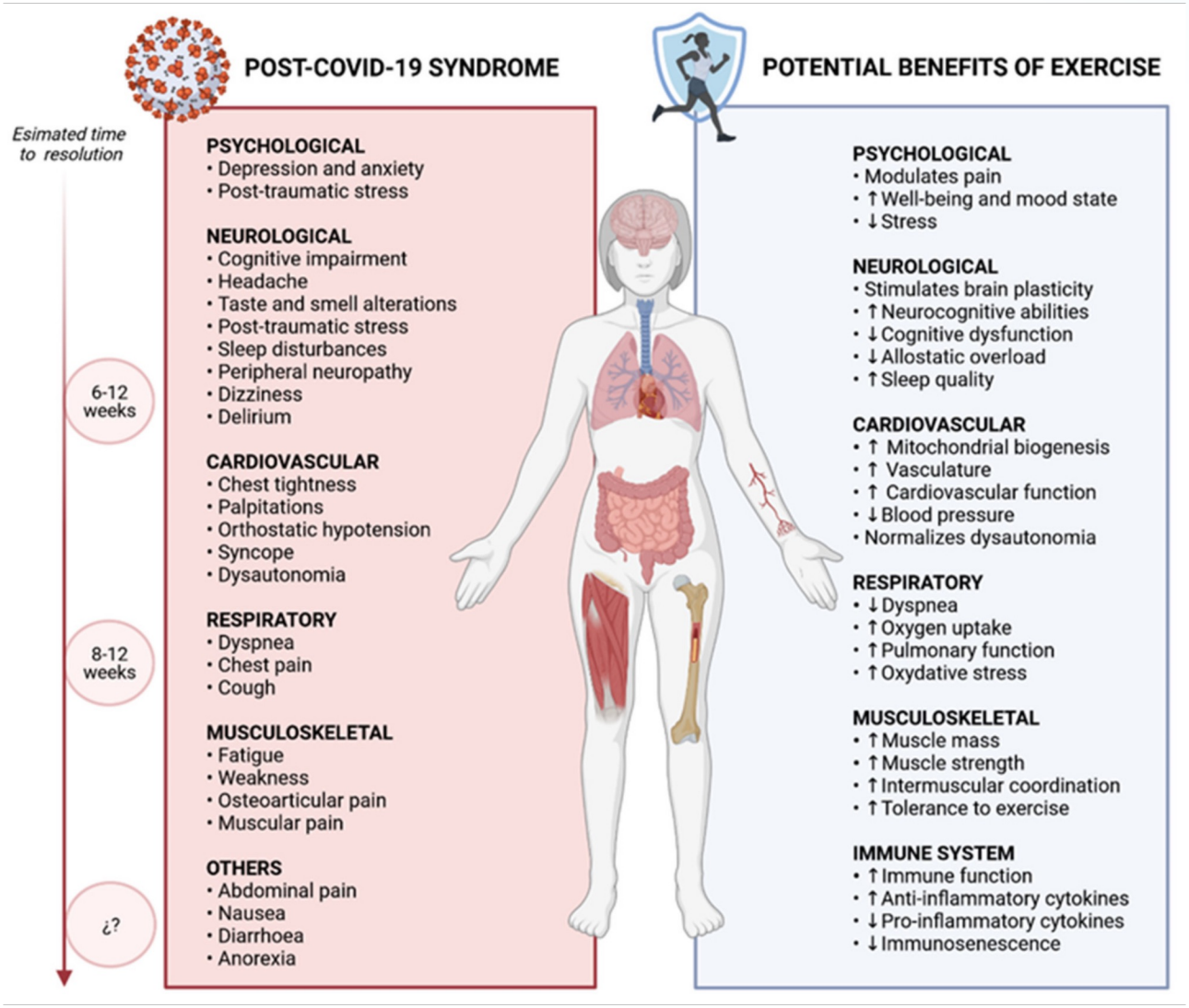
https://www.ardsandnorthdown.gov.uk/downloads/borg-rating-of-perceived-exertion.pdf

Potential Benefits of Exercise



(Jimeno-Almazán, 2021)

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Case Study

Management of an Individual With Post-COVID Syndrome: M.S. Case Study

Background:

59-year-old female **contracted SARS-CoV-2 infection in May 2020**. Patient continues to experience **persisting symptoms, including cognitive changes and fatigue.** She underwent a neuropsychological evaluation on 7/1/21 where she was diagnosed with **frontal lobe executive function deficit, attention weakness, depression and fatigue.**

Evaluations:

Received **Occupational Therapy Evaluation** on 9/21/21

Received **Speech Therapy Evaluation** on 4/28/22

Received **Physical Therapy Evaluation** on 4/29/22

Signs/symptoms

- Increased dizziness after cognitively demanding tasks
- Fatigue
- Joint pain

Functional complaints

- Difficulty with laundry and other household chores
- Inability to participate in leisure activities
- Difficulty returning to work

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Physical Therapy Management of an Individual With Post-COVID Syndrome: M.S. Case Study

Initial Examination

- **6 Minute Walk Test**: 1006 ft.
- **Timed Up and Go (TUG)**: 15.4 seconds
- **TUG cognitive:** 23.6 seconds (53% increase)
- **Activities-specific Balance Confidence Scale:** 46.88% confidence
- **5 Time Sit to Stand:** 26.9 seconds
- **Self-selected gait speed:** 0.96 m/s
- **Functional Gait Assessment:** 18/30
- Negative screen for orthostatic intolerance

Intervention

→ Supervised PT 2-3x/week for 25 weeks for 60 minutes
→ Aerobic training
→ Strength training
→ Dual-task training
→ Dynamic balance training
→ Education
→ Progression based on symptoms (dizziness)

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Speech Therapy Management of an Individual With Post-COVID Syndrome: M.S., Case Study

Initial Examination: CLQT

- **Attention:** Score 206 - WNL
- **Memory:** 169 - WNL
- **Executive Functions:** 31 - WNL
- **Language:** 31 - WNL
- **Visuospatial Skills:** 100 - WNL
- **Clock Drawing:** 13 - WNL

Neuro QOL: Raw Score: 55/140

- Making simple mistakes
- Word-finding
- Re-reading something to understand it
- Forgetting name of familiar person
- Slow thinking, trouble forming thoughts
- Trouble Concentrating
- Trouble planning out steps of a task

Intervention

→ Supervised ST 2x/week for 9 weeks for 45-60 minutes

→ Manage cognitive fatigue

→ Education on strategies to target memory, attention, word finding, and executive functioning skills

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References

Becker, J.H., Lin, J.J, Doernberg, M., Stone, K., Navis, A., Festa, J. R., & Wisnivesky, J.P. (2021). Assessment of cognitive function in patients after COVID -19 infection. *JAMA network open, 4*(10), e2130645-e2130645.

Burns, R. Lucas, et al. "Long COVID Clinical Summary." *APTA Long COVID Clinical Summaries*, APTA, 23 Sept. 2022, https://www.apta.org/patient-care/evidence-based-practice-resources/clinical-summaries/long-covid.

Davis, Hannah E., et al. "Characterizing Long Covid in an International Cohort: 7 Months of Symptoms and Their Impact." *EClinicalMedicine*, vol. 38, 2021, p. 101019., https://doi.org/10.1016/j.eclinm.2021.101019.

Jimeno-Almazán A, Pallarés JG, Buendía-Romero Á, Martínez-Cava A, Franco-López F, Sánchez-Alcaraz Martínez BJ, Bernal-Morel E, Courel-Ibáñez J. Post-COVID-19 Syndrome and the Potential Benefits of Exercise. *International Journal of Environmental Research and Public Health*. 2021; 18(10):5329. https://doi.org/10.3390/ijerph18105329

Kennedy, M.R. (2017). *Coaching college students with executive function problems.* Guilford Publications.

Koyuncu, O., Hogue, I., & Enquist, L. (2013). Virus infections in the nervous system. *Cell host & microbe, 13*(4), 379-393.

Mashima, P.A., Wardrobe-Perrine, B., MacLennan, D., Sohlberg, M.M., Perla, L. Y., & Eapen, B.C. (2021). Interprofessional collaborative management of postconcussion cognitive symptoms. *American journal of speech-language pathology, 30*(4), 1598-1610.

Twomey, R., DeMars, J., Franklin, K., Culos-Reed, S.N., Weatherald, J., & Wrightson, J.G. (2021). Chronic fatigue and post-exertional malaise in people living with long COVID. *MedRxiv.*

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References

The VHA Long COVID Integrated Project Team. *Whole Health System Approach to Long Covid.* (2022). U.S. Department of Veterans Affairs. https://www.publichealth.va.gov/n-coronavirus/docs/Whole-Health-System-Approach-to-Long-COVID_080122_FINAL.pdf

Wylie, G.R., & Flashman, L.A. (2017). Understanding the interplay between mild traumatic brain injury and cognitive fatigue: models and treatments. *Concussion (London, England)*, 2(4), CNC50.

World Physiotherapy. World Physiotherapy Response to COVID-19 Briefing Paper 9. Safe rehabilitation approaches for people living with Long COVID: physical activity and exercise. London, UK: World Physiotherapy; 2021.

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Thank you!

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