A LONG JOURNEY: COVID-19 REHABILITATION & RECOVERY

Daniel Malone PhD, PT

Associate Professor

Physical Medicine & Rehabilitation

Physical Therapy Program

University of Colorado Anschutz Medical Campus

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Disclosures

I have no disclosures to report

SESSION OBJECTIVES

1. Describe the sequelae of “Long COVID” (i.e., Post-Acute Sequelae of SARS-CoV-2 infection (PASC)) with an emphasis on physical, cognitive and mental health.

2. Review current concepts for the rehabilitation management of patients with “Long Covid”.

3. Illustrate the importance of interprofessional teams in the holistic management of the varied sequalae of “Long Covid”.

Post-Acute Sequelae of SARS-CoV-2 infection (PASC))

- "Post COVID Conditions": an umbrella term for the wide range of physical and mental health consequences experienced by some patients that are present four or more weeks after SARS-CoV-2 infection, including by patients who had initial mild or asymptomatic acute infection.

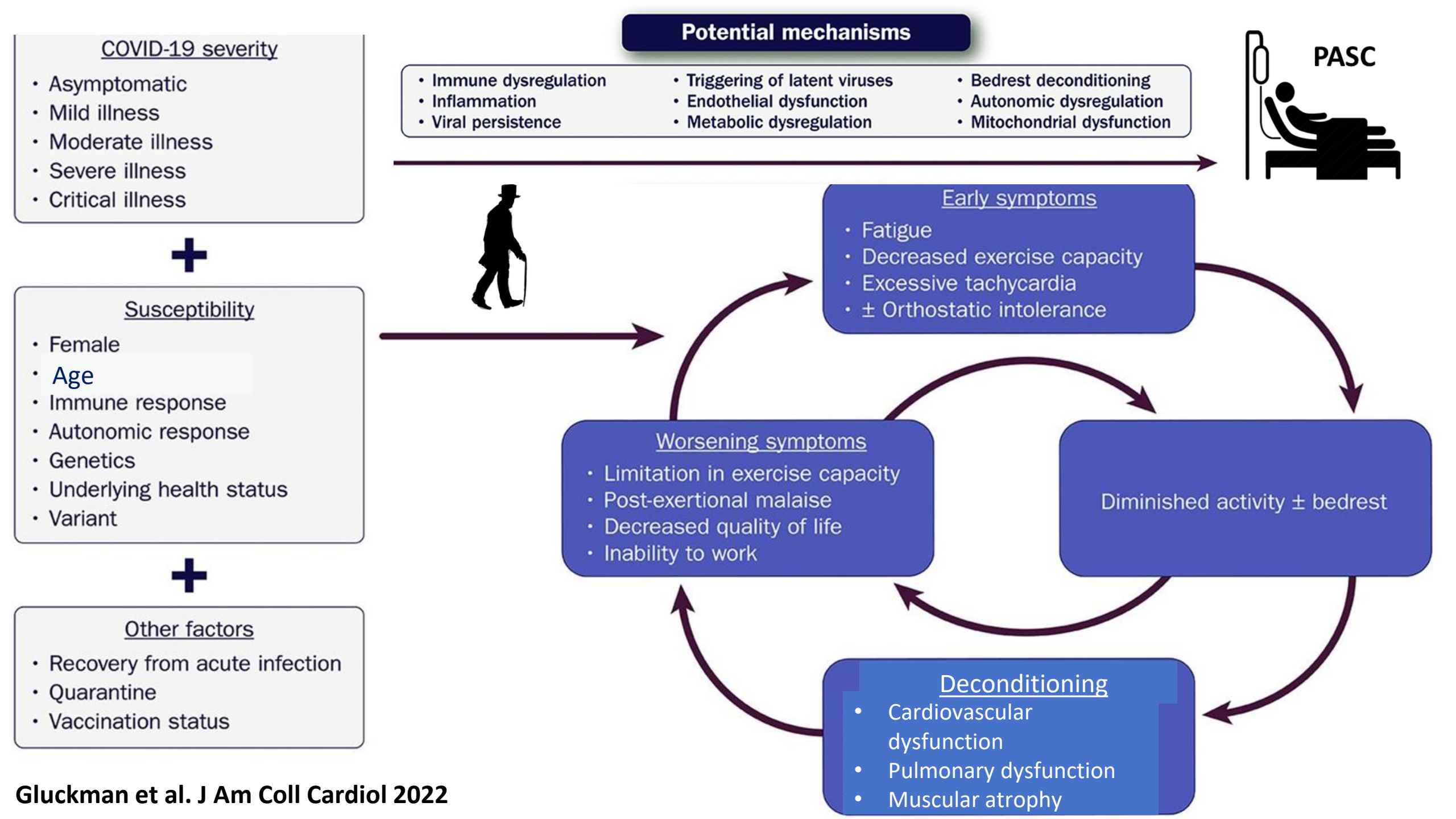
Long Haul COVID

Long Hauler Syndrome

Post-COVID Syndrome

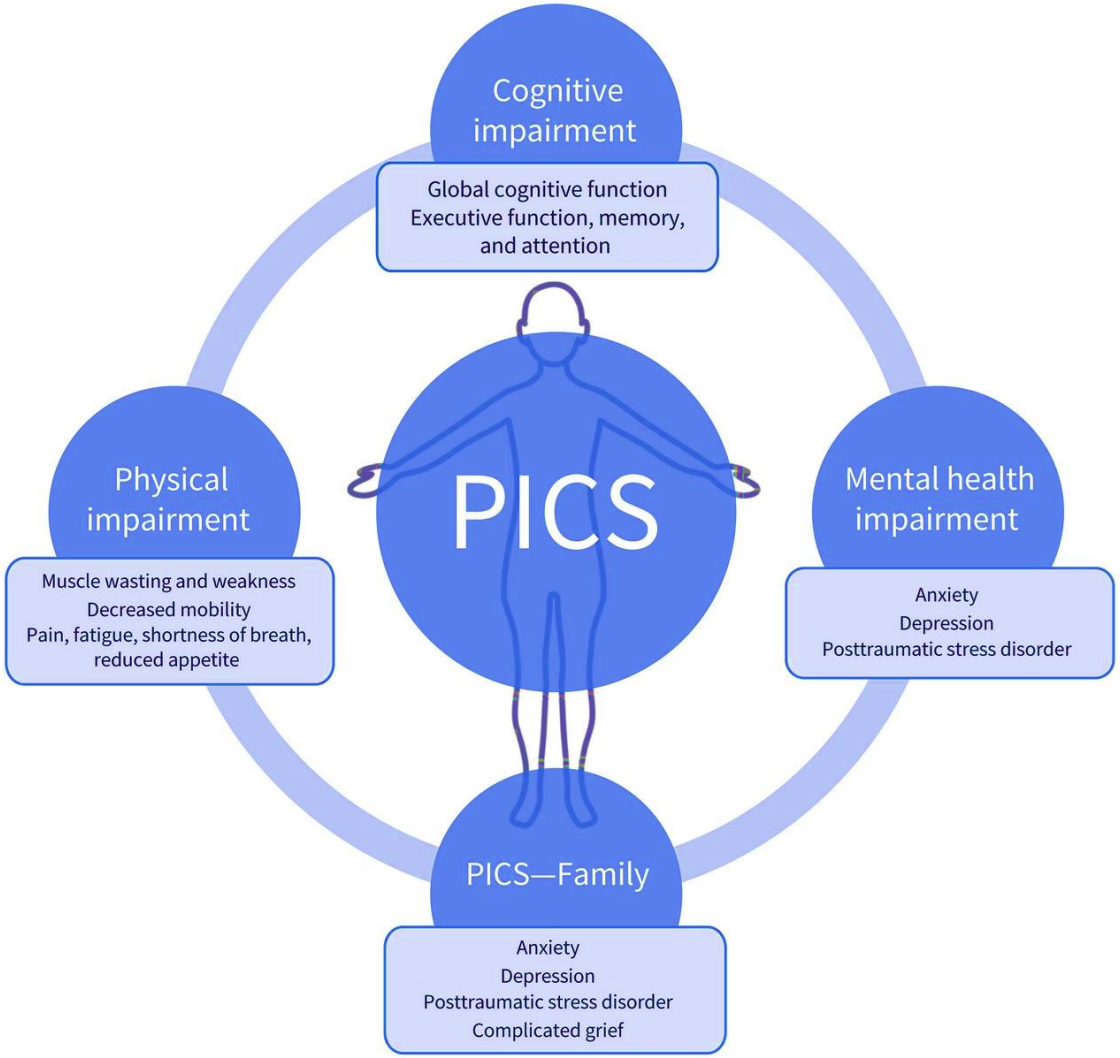
Long COVID

Long-term COVID

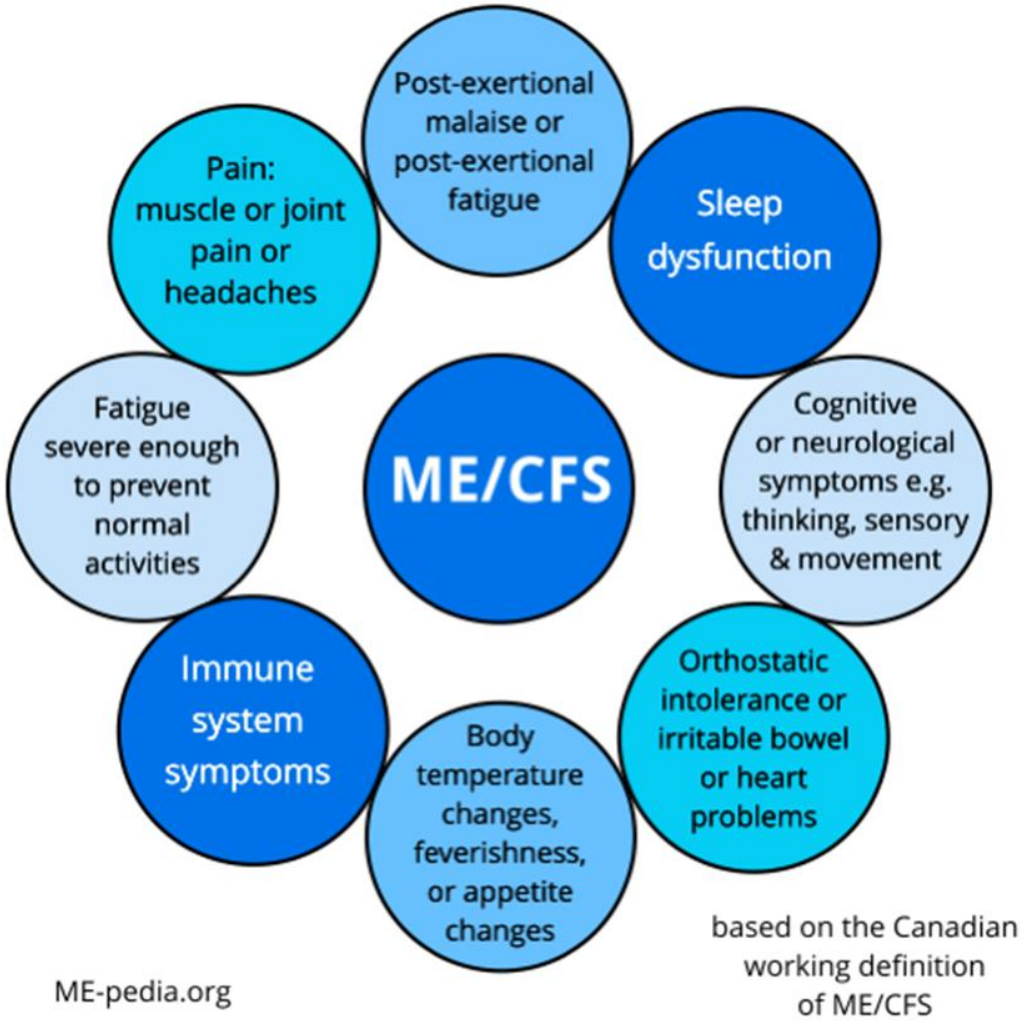


Gluckman et al. J Am Coll Cardiol 2022

Post Intensive Care Syndrome -PICS-



Myalgic Encephalomyelitis Chronic Fatigue Syndrome -ME/CFS-

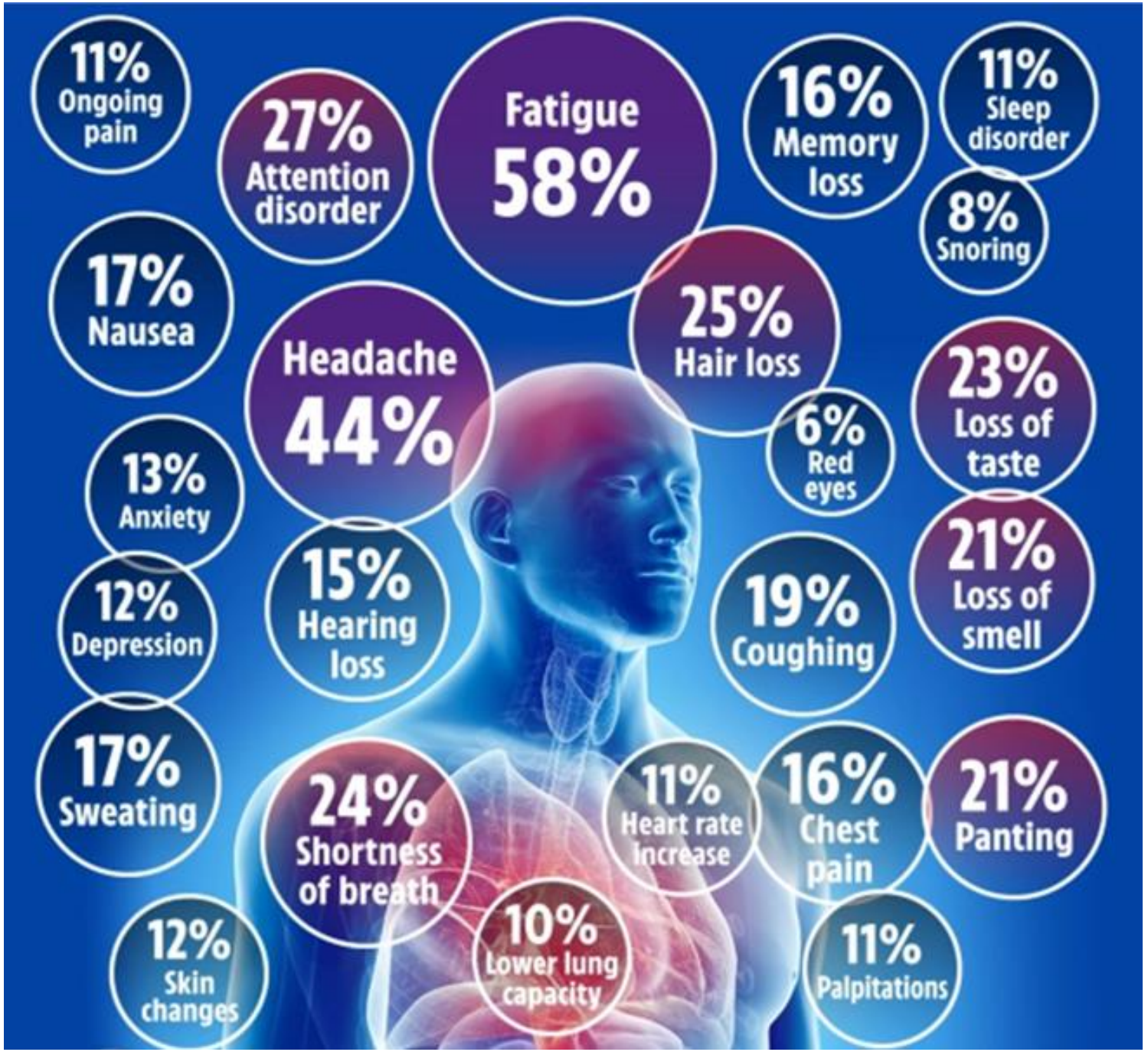


Geen O et al. CMAJ 2021;193:E1525-E1533

Common PASC Symptoms

Over 50 have been identified:

- Fatigue
- Myalgia/ Arthralgia
- DOE/SOB
- Brain Fog/ Attention Disorder
- Headache
- Depression



Lopez-Leon S et al. Sci Rep. 2021.
Image adapted from: https://www.the-sun.com/news/2246680/graphic-reveals-most-commonsymptoms-long-covid/.

COVID-19 disease trajectories among nursing home residents

Most common signs & symptoms:

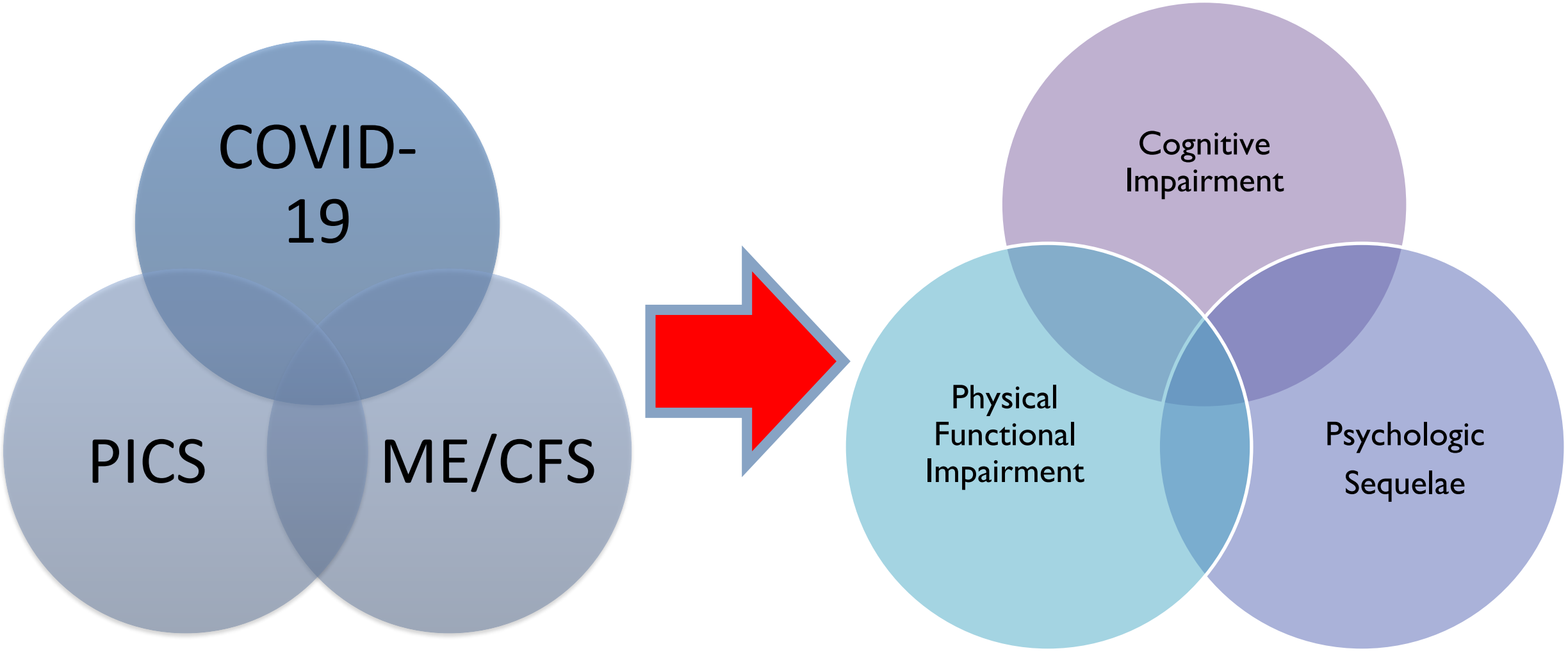
- Fever of 99F or higher (74%)
- Malaise (62%)
- Anorexia (62%)

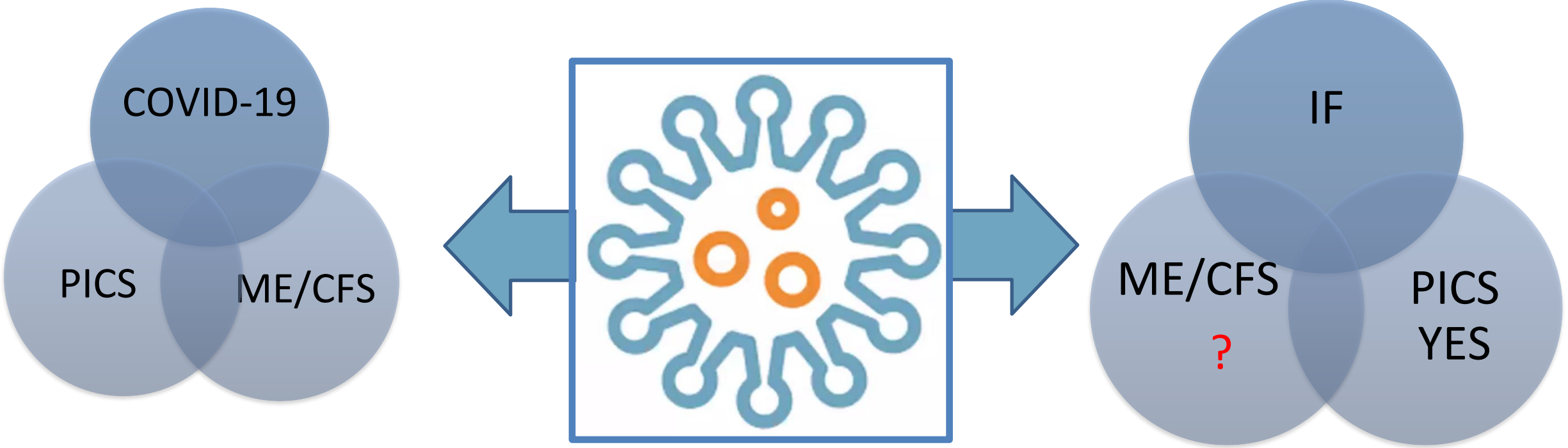
- Hypoxia (55%)
- Cough (51%)

- Altered MS (32%)
- Dyspnea (26%)

Carnahan JL, Lieb KM, et al. J Am Geriatr Soc. 2021

PASC, Common Symptoms & Rehab





Should patients with PASC engage in rehabilitation?

If YES

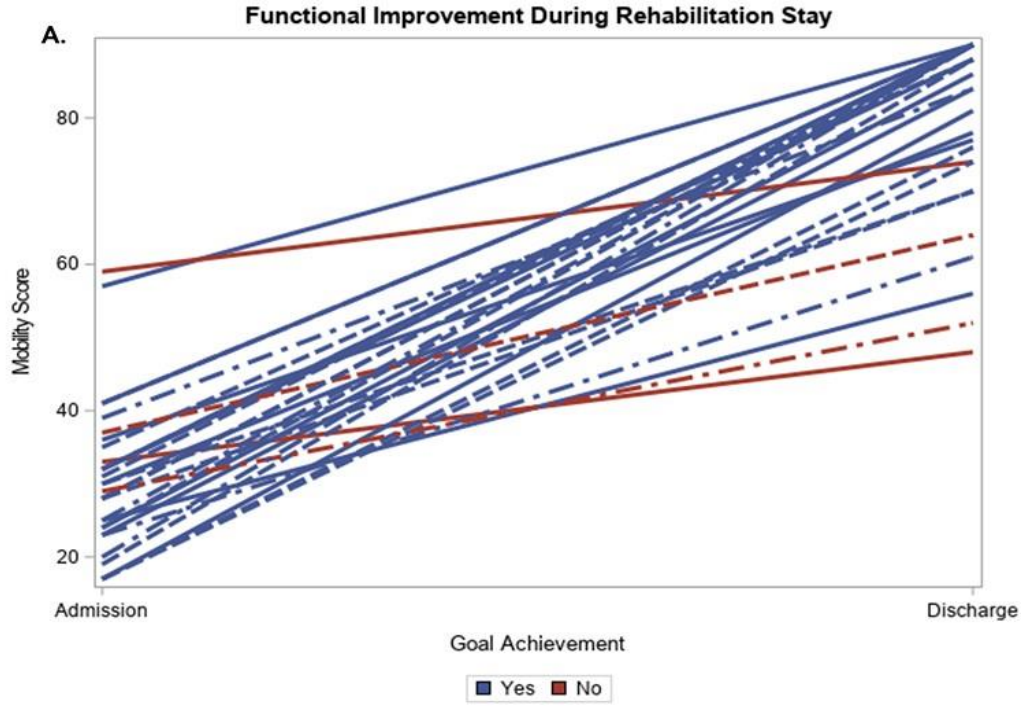
Are there specific precautions?

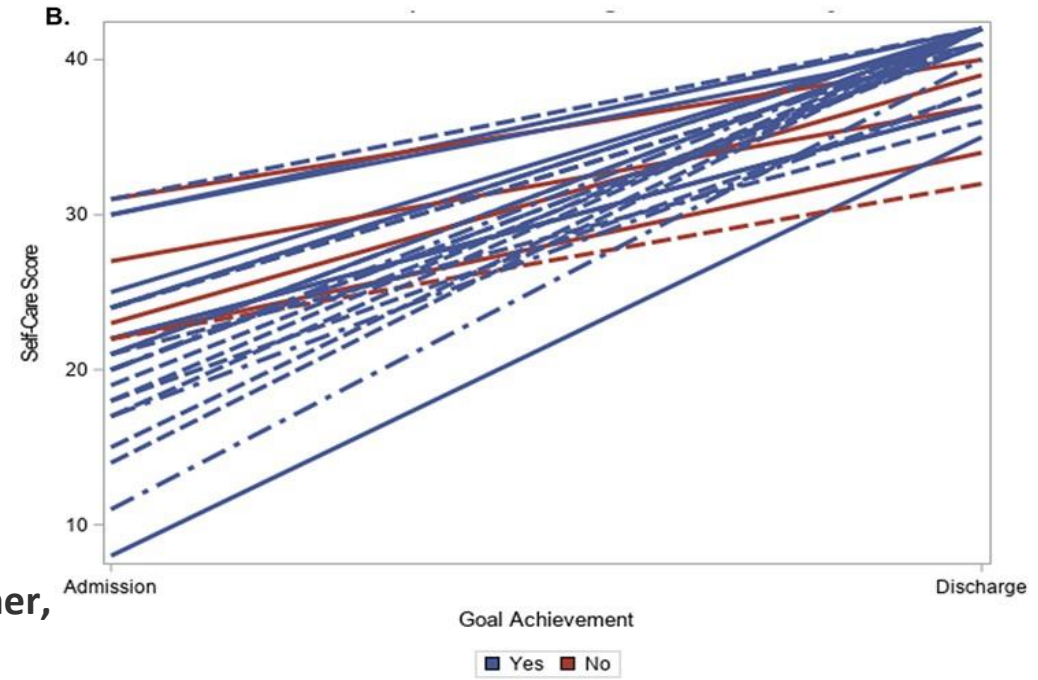
PACS & IRF

- 30 patients admitted to IRF
  - 90% required critical care (25% MV ~ 18.8 days)
- Average mobility score at admission: 30.4
- Average mobility score at discharge: 79.6

- Average self-care score at admission (21.4)
- Average self care score at discharge: 39

- Frequent & longer duration rehab (approximately 3 h/d and at least 900 min/wk) is safe and feasible





Vickory F, Ridgeway et al. Phys Ther, 2021

More Outcomes in the IRF Setting

Outcome Measure	Admission Assessment	Discharge Assessment	p-value [a]
Berg Balance Scale, mean (SD), (n = 24)	22.6 (18.5)	43.7 (14.0)	<0.001*
10 Meter Walk Test, mean meters per second (SD), (n = 17)	0.25 (0.25)	0.86 (0.57)	<0.001*
6 Minute Walk Test, mean meters (SD), (n = 19)	206.6 (258)	764.5 (276.1)	<0.001*
Functional Independence, No. (%)			
Transfer independence (n = 29)	1 (3.4%)	27 (93.1%)	<0.001*
Ambulation independence (n = 29)	0 (0%)	25 (86.2%)	<0.001*
Functional Communication Measure, median (IQR)			
Voice (n = 6)	4 (4–5)	6.5 (4.75–7)	0.032*
Swallowing (n = 18)	4 (3–5)	7 (7–7)	<0.001*
Attention (n = 19)	4 (4–5)	7 (6–7)	<0.001*
Memory (n = 18)	4 (4–5)	7 (6.25–7)	<0.001*
Problem Solving (n = 18)	4 (4–5)	7 (6.25–7)	<0.001*

Olezene CS et al. PLOS ONE 16(3), 2021.
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0248824

Treatment Recommendations

- Individually **titrated, symptom-guided** program
  - Initial Goal: restore patients to previous levels of activity and improve quality of life.
  - Until those goals have been achieved, the rehabilitation program should not focus on high intensity interventions

- Continually assess for Post Exertional Malaise (PEM)
  - RPE Scales are useful
- Fatigue Assessment
- Abnormal cardiopulmonary responses

Fukuda K et al., 1994; FDA, 2013.
Herrera JE et al. PM R 2021

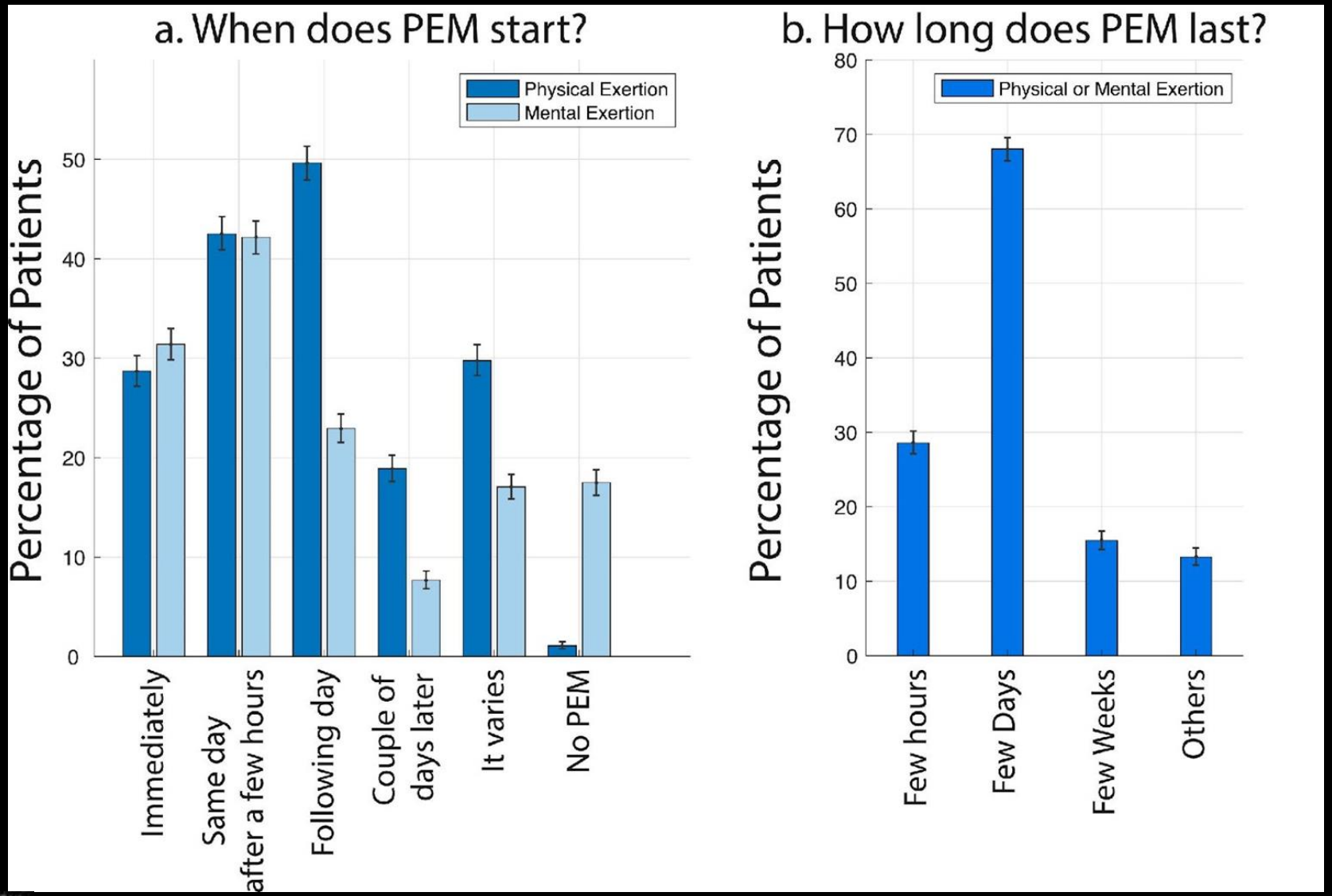
Post-Exertional Malaise (PEM)

Post-exertional malaise is characteristic of ME/CFS and most ME/CFS patients experience it

- Malaise includes feeling bad, sick, tired as well as fatigued
- Patients describe this as “crash” or “relapse” of illness, as all symptoms are worsened, not just fatigue
- Exertion could be physical or mental
- The malaise persists for more than 24 hours
- Leads to additional limitation in activities

Fukuda K et al., 1994; FDA, 2013.
Herrera JE et al. PM R 2021

Fig. 8



EClinicalMedicine 2021 38DOI: (10.1016/j.eclinm.2021.101019)

Treatment Recommendations

- Initial Activity Goals: ~ 3-5 METs (similar workload for ADL's)
- Progression
  - If symptoms worsen, activity should be returned to the previously tolerated level.
- Energy Conservation
  - "Four Ps": Pacing, Prioritizing, Positioning, & Planning
  - Use of adaptive equipment
  - Identification of "energy windows"
- Encourage healthy sleep & dietary patterns and hydration.

Herrera JE et al. PM R 2021

Modified Borg Scale

(Exertion or Dyspnea Scales)

0	-	At Rest
1	-	Very easy
2	-	Somewhat easy
3	-	Moderate
4	-	Somewhat hard
5	-	Hard
6	-	
7	-	Very Hard
8	-	
9	-	
10	-	Very Very Hard

PASC Rehab

Special Considerations: Fatigue

- Fatigue is a feeling of weariness, tiredness, or lack of energy. It can be **physical**, **cognitive**, or **emotional**, mild to severe, intermittent to persistent, and affect a person's energy, motivation, and concentration.

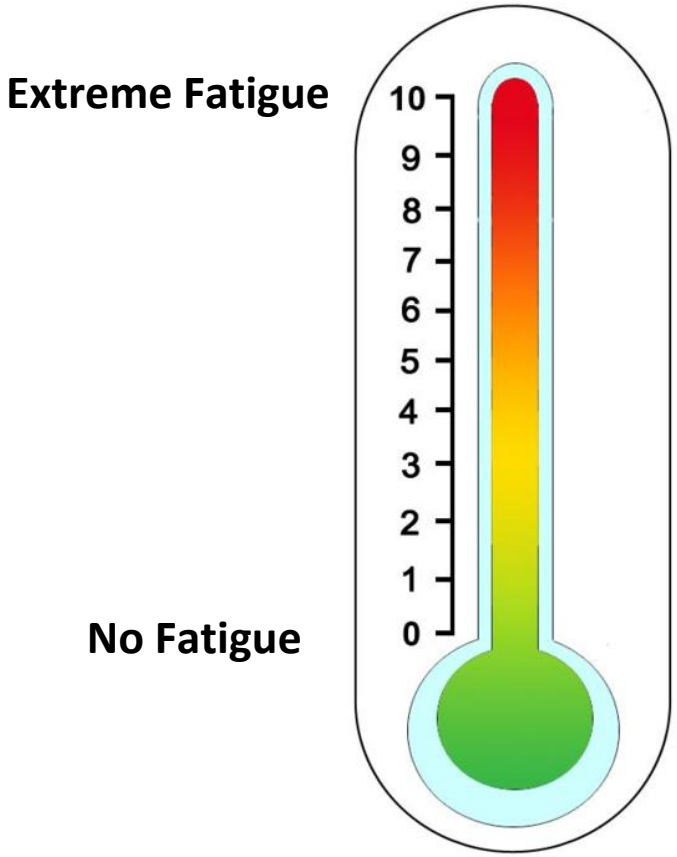
- Fatigue is "multi-dimensional"

Herrera JE et al. 2021 PM R
NCCN 2018; Servaes et al 2002; Cella et al 2001

Example of Fatigue Tools

Fatigue Thermometer

Pick a number (0-10) that best describes how much fatigue you have been experiencing in the past week including today.



One Item Fatigue Scale

- "Since your last visit, how would you rate your worst fatigue on a scale of 0 to 10?"

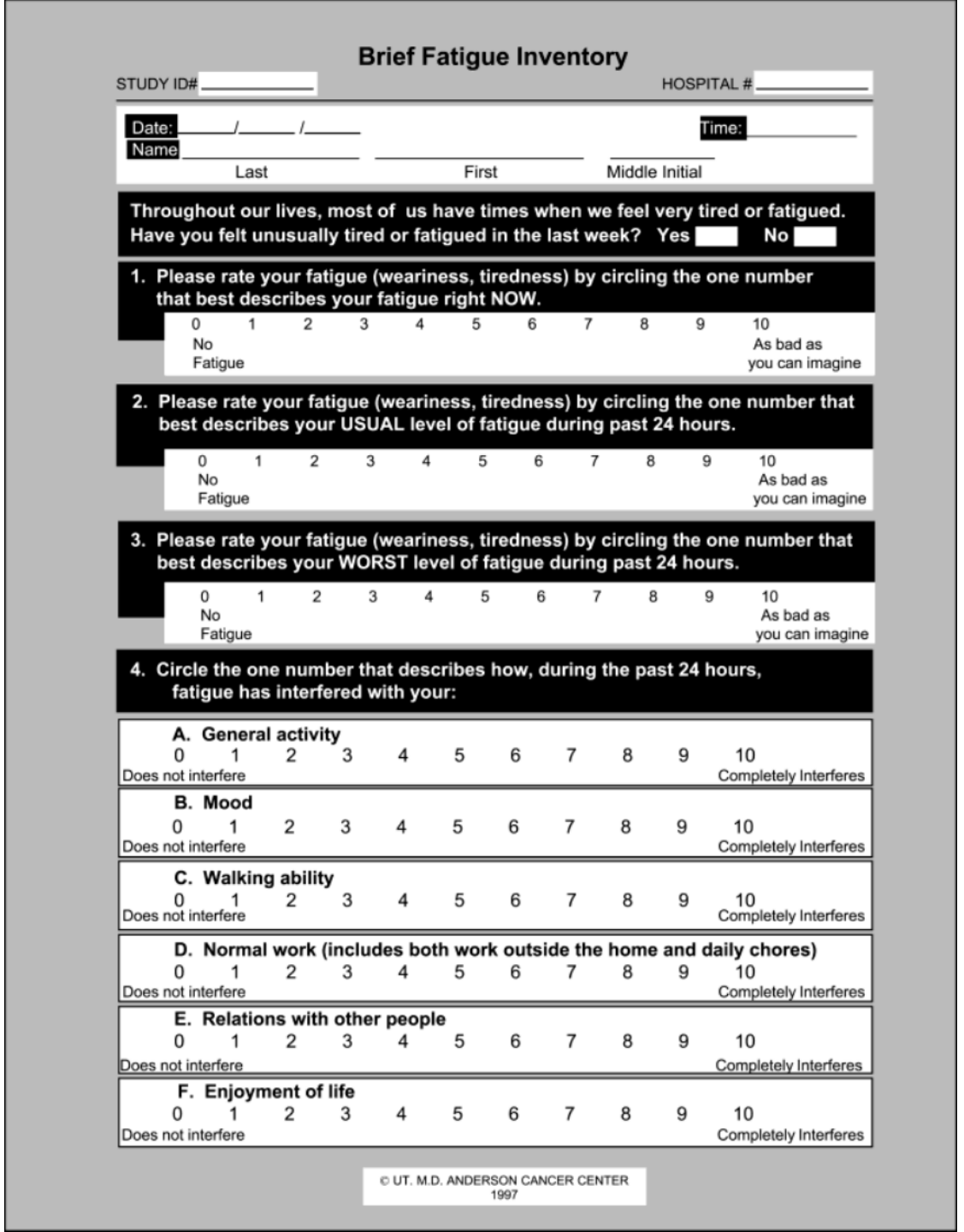
- Categorical description as follows:
  - 0: No fatigue
  - 1-3: Mild fatigue
  - 4-6: Moderate fatigue
  - 7-10: Severe fatigue

Example of Fatigue Tools:

Brief Fatigue Inventory (BFI)

THE UNIVERSITY OF TEXAS
MD Anderson Cancer Center

https://www.mdanderson.org/research/departments-labs-institutes/departments-divisions/symptom-research/symptom-assessment-tools/brief-fatigue-inventory.html



Brief Fatigue Inventory

STUDY ID# _____ HOSPITAL # _____

Date: ____/____/____ Time: _____

Name _____ _____ _____

Last First Middle Initial

Throughout our lives, most of us have times when we feel very tired or fatigued. Have you felt unusually tired or fatigued in the last week? Yes ☐ No ☐

1. Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your fatigue right NOW.

0 1 2 3 4 5 6 7 8 9 10
No Fatigue — As bad as you can imagine

2. Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your USUAL level of fatigue during past 24 hours.

0 1 2 3 4 5 6 7 8 9 10
No Fatigue — As bad as you can imagine

3. Please rate your fatigue (weariness, tiredness) by circling the one number that best describes your WORST level of fatigue during past 24 hours.

0 1 2 3 4 5 6 7 8 9 10
No Fatigue — As bad as you can imagine

4. Circle the one number that describes how, during the past 24 hours, fatigue has interfered with your:

A. General activity
0 1 2 3 4 5 6 7 8 9 10
Does not interfere — Completely Interferes

B. Mood
0 1 2 3 4 5 6 7 8 9 10
Does not interfere — Completely Interferes

C. Walking ability
0 1 2 3 4 5 6 7 8 9 10
Does not interfere — Completely Interferes

D. Normal work (includes both work outside the home and daily chores)
0 1 2 3 4 5 6 7 8 9 10
Does not interfere — Completely Interferes

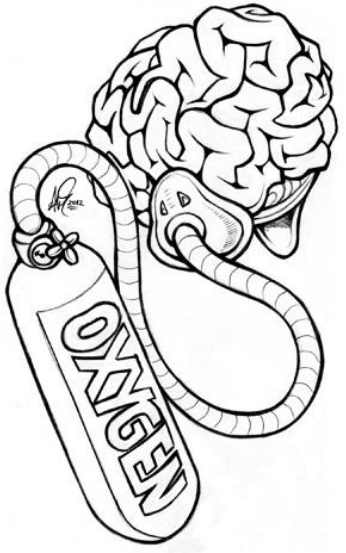
E. Relations with other people
0 1 2 3 4 5 6 7 8 9 10
Does not interfere — Completely Interferes

F. Enjoyment of life
0 1 2 3 4 5 6 7 8 9 10
Does not interfere — Completely Interferes

Special Considerations

- Hypoxemia/ Silent Hypoxemia
  - Hypoxemia: a below-normal level of oxygen in the blood
  - Silent: an individual has a **lower oxygen saturation** level than anticipated, however, the individual **does not experience any breathing difficulty**

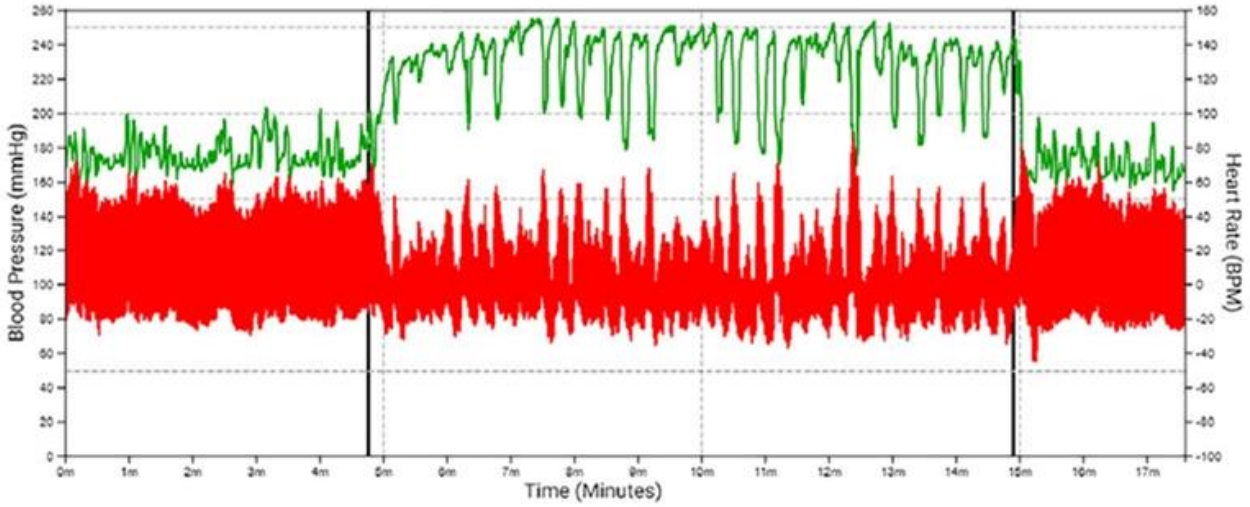
- Pulse Oximetry
  - Assess for accuracy
    - Pulses & digital perfusion
    - Review pulse waveform (pleth)



Rahman A, Tabassum T, Araf Y, Al Nahid A, Ullah MA, Hosen MJ. Silent hypoxia in COVID-19: pathomechanism and possible management strategy. Mol Biol Rep. 2021;48(4):3863-3869.

Special Considerations

- Tachycardia & Postural Orthostatic Tachycardia Syndrome (POTS)
  - Characterized,
    - Complaints of lightheadedness, palpitations, headaches, nausea/vomiting, fatigue
  - A sustained heart rate (HR) increment of ≥30 beats/min within 10 min of standing



Tachycardia:
- Δ42 bpm

Labile BP:
- ΔSBP~ 14-34 mmHg

Shouman K et al. 2021
Dani M et al. 2021
Freeman R et al. 2018

Special Considerations

- Tachycardia & POTS
  - Education:
    - Avoid hot baths/showers, Valsalva, large meals; dehydration; HOB elevation;
    - To do (counter pressure maneuvers): isometrics; crossing & uncrossing UE/LE; squatting
    - Other Considerations: hydration, sodium intake, compression garments, & progressive exercise
  - Referral

Shouman K et al. 2021
Dani M et al. 2021
Freeman R et al. 2018

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