

Update on PASC

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JOHNS HOPKINS
M E D I C I N E

Disclosures

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Teach for America,

Aspen Institute,

Uptodate,

Medicolegal work

Objectives

- Understand different definitions of Post Acute Sequelae of COVID-19 (PASC)
- Appreciate risk factors for PASC
- Work up of PASC
- Treatment options
- JHU PACT Clinic
- Important Future Research Questions

What is PASC?

Depends on who you ask!

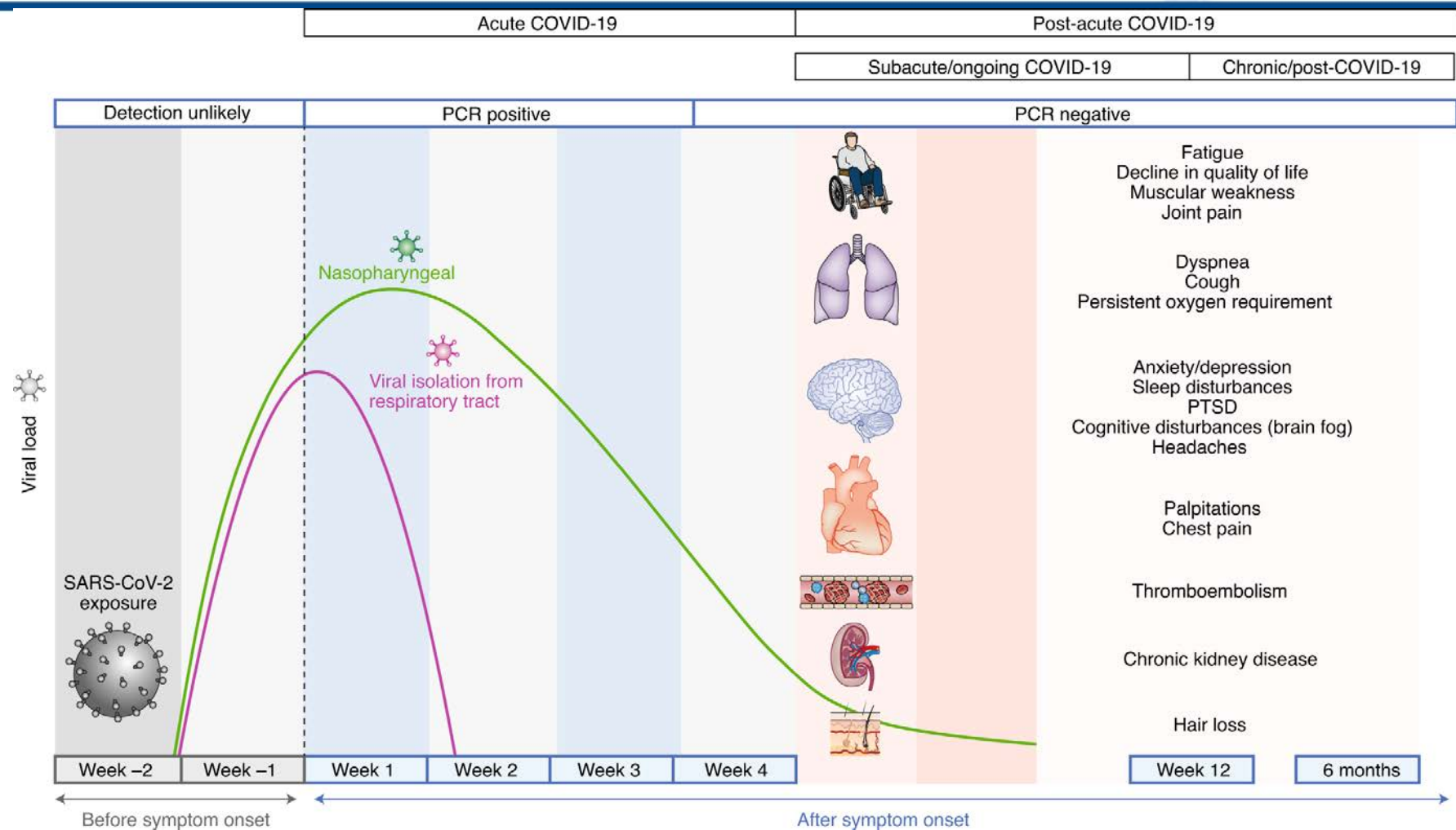
Post COVID-19 condition occurs in individuals with a **history of probable or confirmed SARS-CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms that last for at least 2 months and cannot be explained by an alternative diagnosis.** Common symptoms include **fatigue, shortness of breath, cognitive dysfunction** but also others (see **Table 3** and **Annex 2**) which 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. A separate definition may be applicable for children.

Oct. 6 2021

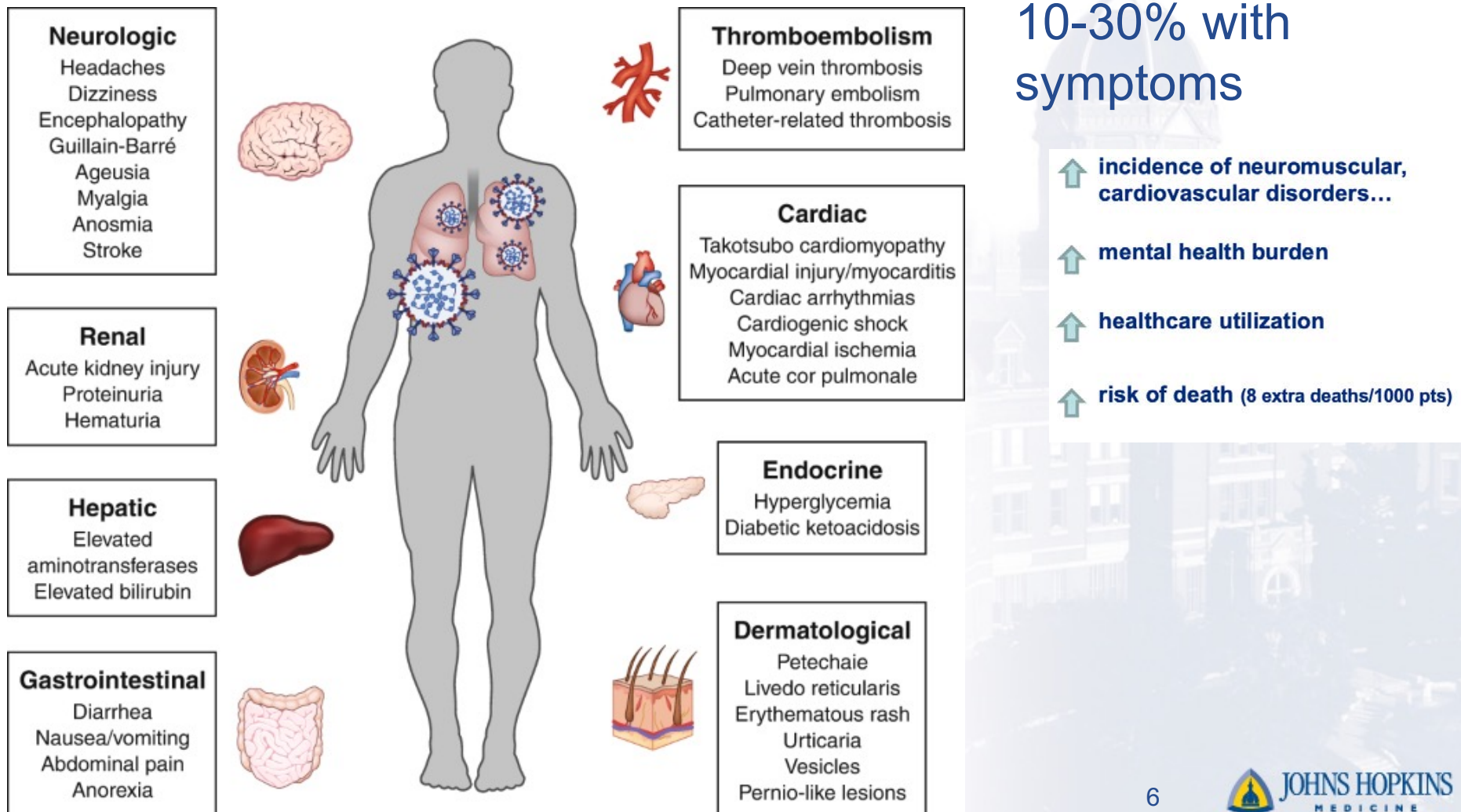
Post-COVID Conditions

We use **post-COVID conditions** as an umbrella term for the wide range of health consequences that are present **four or more weeks** after infection with SARS-CoV-2. The time frame of four or more weeks provides a rough approximation of effects that occur beyond the acute period, but the timeframe might change as we learn more.

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



Post-Acute Sequelae of SARS-CoV-2



Risk Factors for PASC

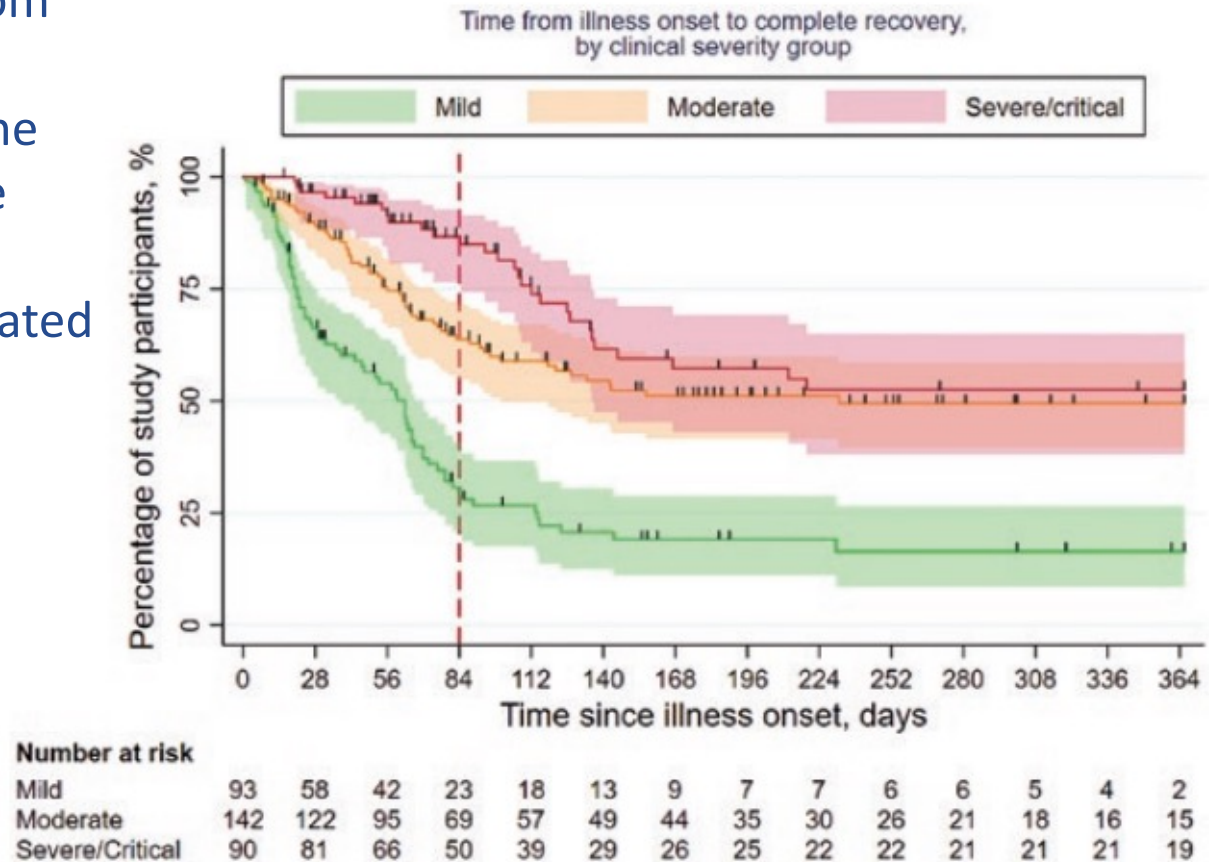
- Severity of COVID-19
- Baseline health status
- Age
- Female sex
- Increased BMI
- Unvaccinated

Severity



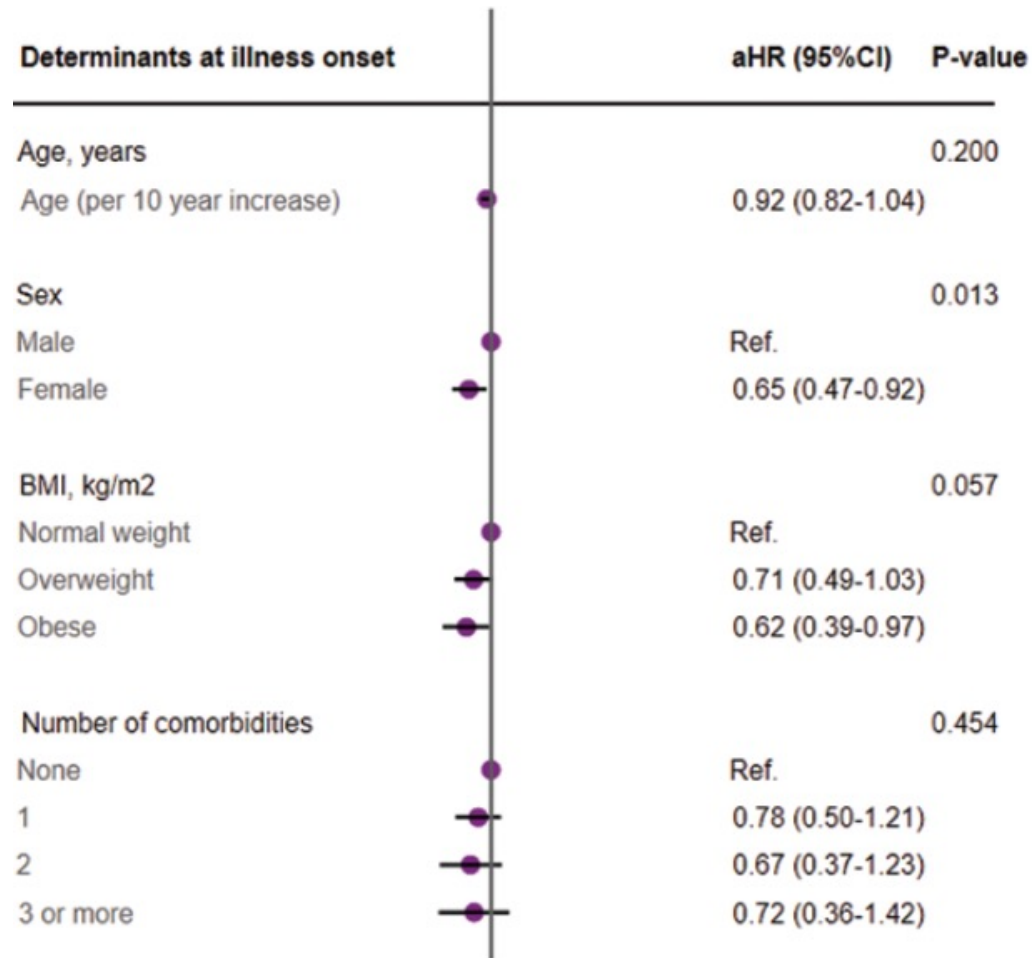
342 Dutch people followed from diagnosis through 1 year with monthly surveys. Assessed time from illness onset to complete recovery.

Female sex and obesity associated with slow recovery



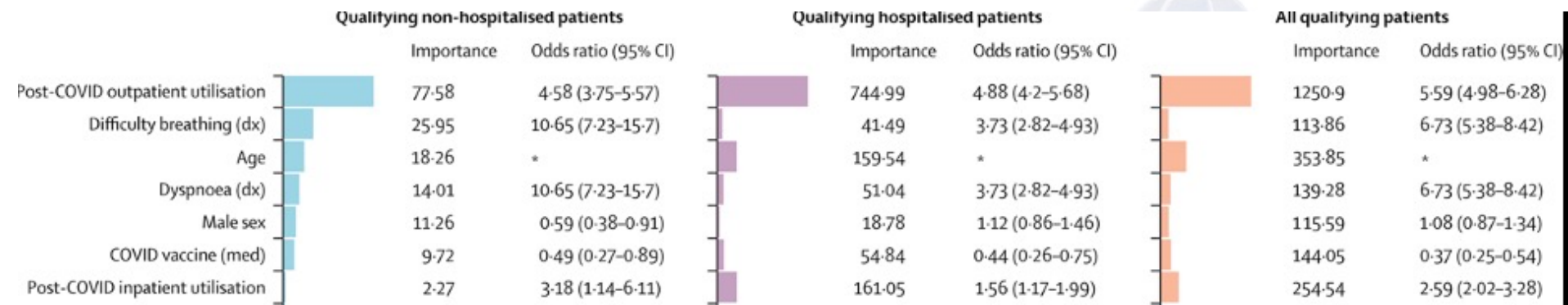
Female sex, obesity

Multivariable Cox proportional hazard model



Wyneberg CID 2021

Predictors of PASC: OP vs. IP



Pfaff 2022 *Lancet Digital Health*

PASC Evaluation Guidelines

- Cardiopulmonary
- Neurologic
- Hypercoagulable
- Olfactory/gustatory
- Fatigue/poor energy
- Vitals (pulse ox)
 - orthostatics
- Assess for fibrosis/pleural effusion
- 6M Walk test

PM R. 2021 Sep;13(9):1027-1043..

PASC Treatment Guidelines

- Fatigue:
 - titrated return to activity,
 - energy conservation strategies,
 - healthy diet and hydration,
 - treat any underlying comorbid conditions including pain/insomnia

PM R. 2021 Sep;13(9):1027-1043..

PASC Treatment

- Cough:
 - OTC cough suppressant as needed
- Dyspnea:
 - Optimize pharmacotherapy for underlying dz
 - Mild symptoms: breathing exercise and breathless management
 - Moderate/Severe: refer to pulmonary, consider pulmonary rehab

PASC Treatment

- Neuro:
 - Consider EMG for weakness
 - Brain Fog: follow with Montreal Cognitive Assessment (MOCA) consider neuropsych eval
- Orthostasis:
 - Mild: hydration, compression stockings, PT
 - POTS: consider medications

1 year outcomes among survivors in China

- N=1276 with 1 year FU (54 admitted to ICU)
 - 49% with ≥ 1 symptom (Fatigue 20%)
 - Dyspnea 30%
 - Anxiety or Depression 26%
-
- Compared to matched controls a greater proportion of COVID-19 survivors had decreased mobility, pain, anxiety/Depression or SOB

**1-year outcomes in hospital survivors with COVID-19:
a longitudinal cohort study**

JH PACT

- **Established April 7, 2020**
- **Post-Intensive Care Syndrome (PICS) framework**
- **Multi-D: PCCM, PM&R, JH Homecare**
- **Telemed/In-person Hybrid**
- **JH PACT-ICU: Severe initial COVID-19 (ICU LOS > 48hrs)**
- **JH PACT-Base: Mild to moderate initial COVID-19**



Ann M. Parker, MD, PhD
PCCM



Alba Azola, MD
PM&R

Rapid Design and Implementation of Post-COVID-19 Clinics

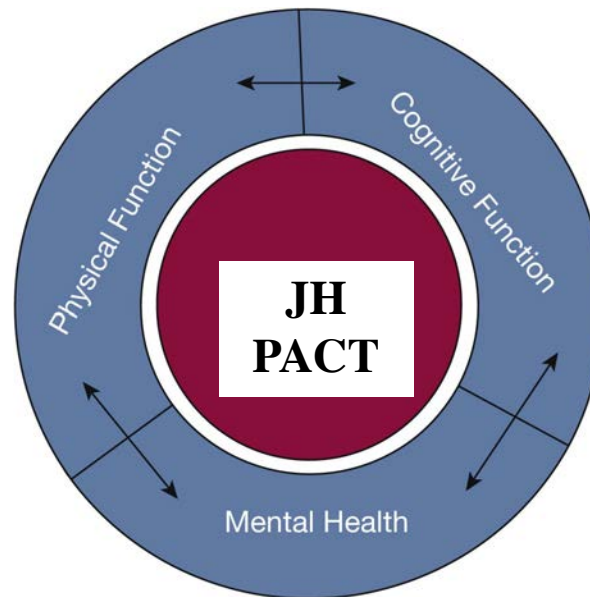


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Neeta Thakur, MD, MPH; Emily Pfeil Brigham, MD, MHS; and Ann Marie Parker, MD, PhD*

THE LANCET
Respiratory Medicine

Core Team:

1. Pulmonary-Critical Care
2. Physical Medicine & Rehabilitation
3. Homecare PT/OT/SLP



Partnerships:

- **Primary Care**
- Psychiatry
- Psychology
- Neurology
- Cardiology
- Hematology
- Infectious Disease
- Nephrology
- Dermatology
- Hepatology
- Otolaryngology

JH PACT:



Pulmonary & Rehabilitation Medicine including:

- Interstitial lung disease
- Postural orthostatic tachycardia syndrome (POTS)



Homecare

- Rehabilitation services
- Nursing



On-Campus Rehabilitation

- Physical Therapy
- Occupational Therapy
- Speech-Language Pathology
- Rehab Psychology

JH PACT → 30% reduction in readmissions (16% to 11%)

Research Opportunities



RECOVER

Researching COVID to Enhance Recovery



<https://recovercovid.org/>

Future?

- What are the phenotypes?
- Does early treatment impact PASC?
- What are the best treatments for PASC?
What are the best mechanisms to prevent PASC?
- What will be the long term outcomes of those with PASC?
 - Will it vary by phenotype?

Thank you!

- Patients and research participants who graciously shared their stories and samples



Questions?

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Twitter: @kgebo

WHO Definition PASC, October 2021

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 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.

<https://apps.who.int/iris/bitstream/handle/10665/345824/WHO-2019-nCoV-Post-COVID-19-condition-Clinical-case-definition-2021.1-eng.pdf>