

# UVM Project ECHO: Post-Acute Sequelae of SARS-CoV-2 Infection (PASC)

September 10, 2021

Course Director: Mark Pasanen, MD

ECHO Director: Elizabeth Cote

Series Faculty: David Kaminsky, MD  
Katherine Menson, DO

RECORDING OF SESSION TO BEGIN



# Typical Agenda

- Introductions
- Objectives
- Didactic Presentation (20-30 min)
- Case presentation
  - Clarifying questions
  - Participants – then faculty panel
- Discussion
- Recommendations
- Summary
- Closing Announcements
  - Submission of new cases
  - Completion of evaluations



# Learning objectives for this ECHO series include the ability to:

## Recognize

Recognize the broad range of chronic symptoms after SARS-CoV-2 infection

## Implement

Implement appropriate diagnostic and treatment strategies for varied presentations

## Assist

Assist patients in the development of comprehensive, multi-disciplinary care plans



# CME Disclosures

University of Vermont (UVM) Office of Continuing Medical and Interprofessional Education (CMIE) is approved as a provider of Continuing Medical Education (CME) by the ACCME. UVM designates this internet live activity for a maximum of 1 AMA PRA Category 1 Credits. Participants should claim only the credit commensurate with the extent of their participation in the activity.

## Interest Disclosures:

- As an organization accredited by the ACCME to sponsor continuing medical education activities, UVMCMIE is required to disclose any real or apparent conflicts of interest (COI) that any speakers may have related to the content of their presentations.



# ***Introduction to Post-Acute Sequelae of SARS-CoV-2 (PASC)***

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*No conflicts to disclose.*



# ***Introduction to Post-Acute Sequelae of SARS-CoV-2 (PASC)***

## Session Objectives:

- Define what timeline and symptoms constitute a diagnosis of Post-Acute Sequelae of SARS-CoV-2 (PASC)
- Identify the most common symptoms of PASC
- Review most recent EBM for prognosis and treatment of patients experiencing PASC



# Case

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27-year-old male, marathon runner

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Late March 2020 developed fevers, malaise, anosmia

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Delay in testing, 4 weeks later negative, CXR normal

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Recovery of fevers, anosmia after 2 weeks

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Tried to return to work

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Persistent dyspnea, fatigue, inability to return to work for 6 months



# Case

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Referred to my office for evaluation

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VS 124/78, **HR 113**, RR 10, SpO2 99%

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Exam: Tachycardia

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Spirometry, DLCO, 6MWT: Normal

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CT Chest PE-Protocol: Normal

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ECG: Sinus Tachycardia

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Stress Test: Normal

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*What next?*

# COVID-19 Outcomes

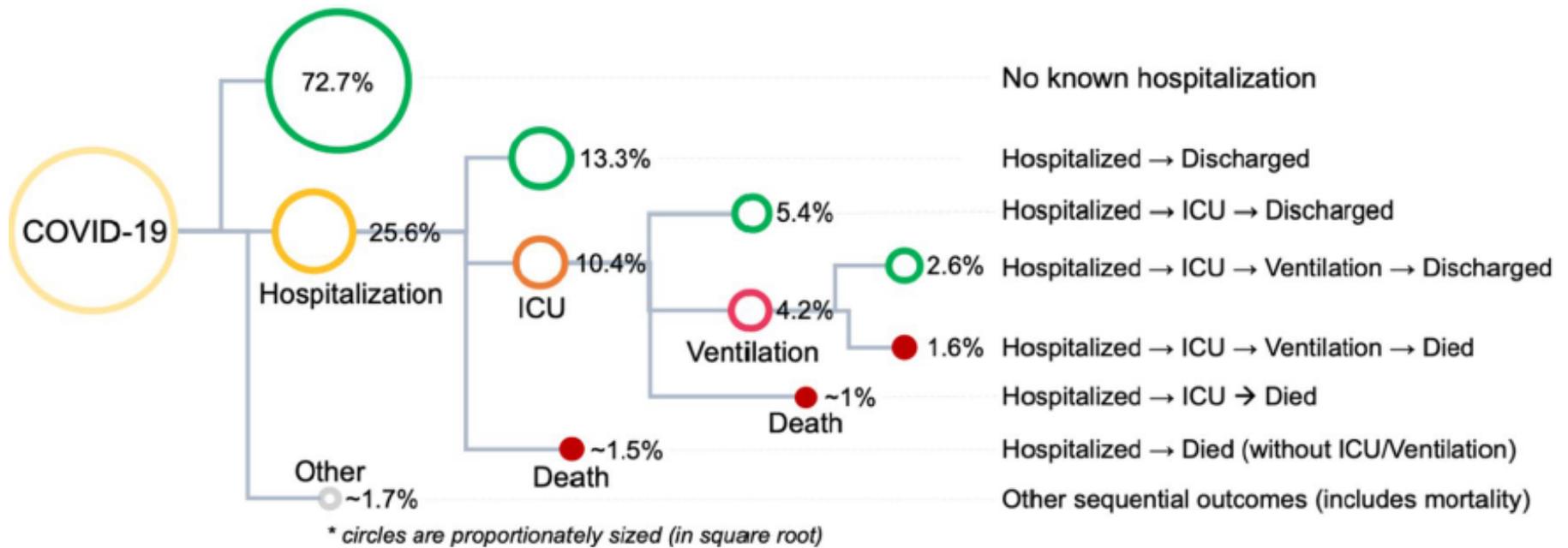
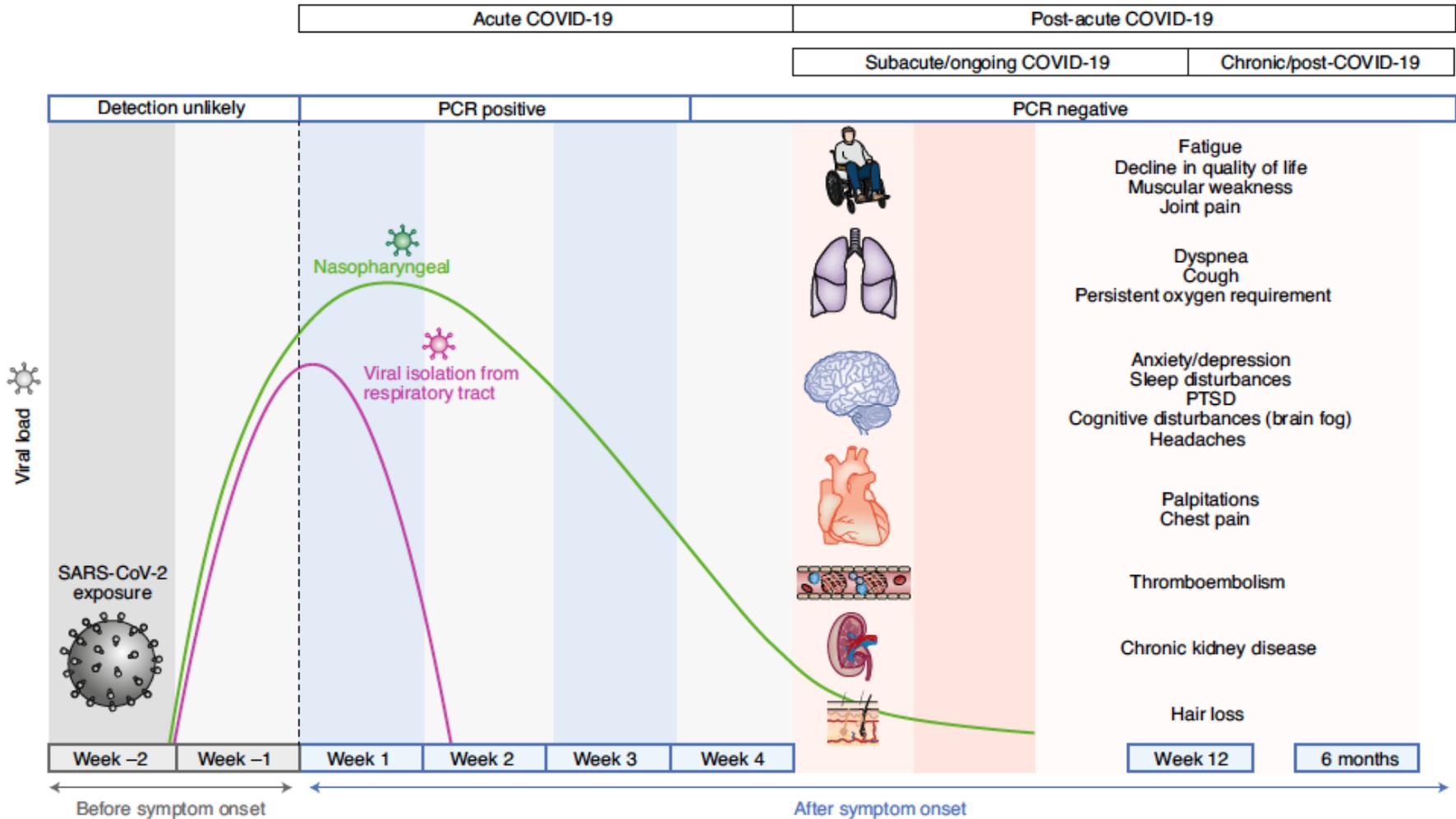
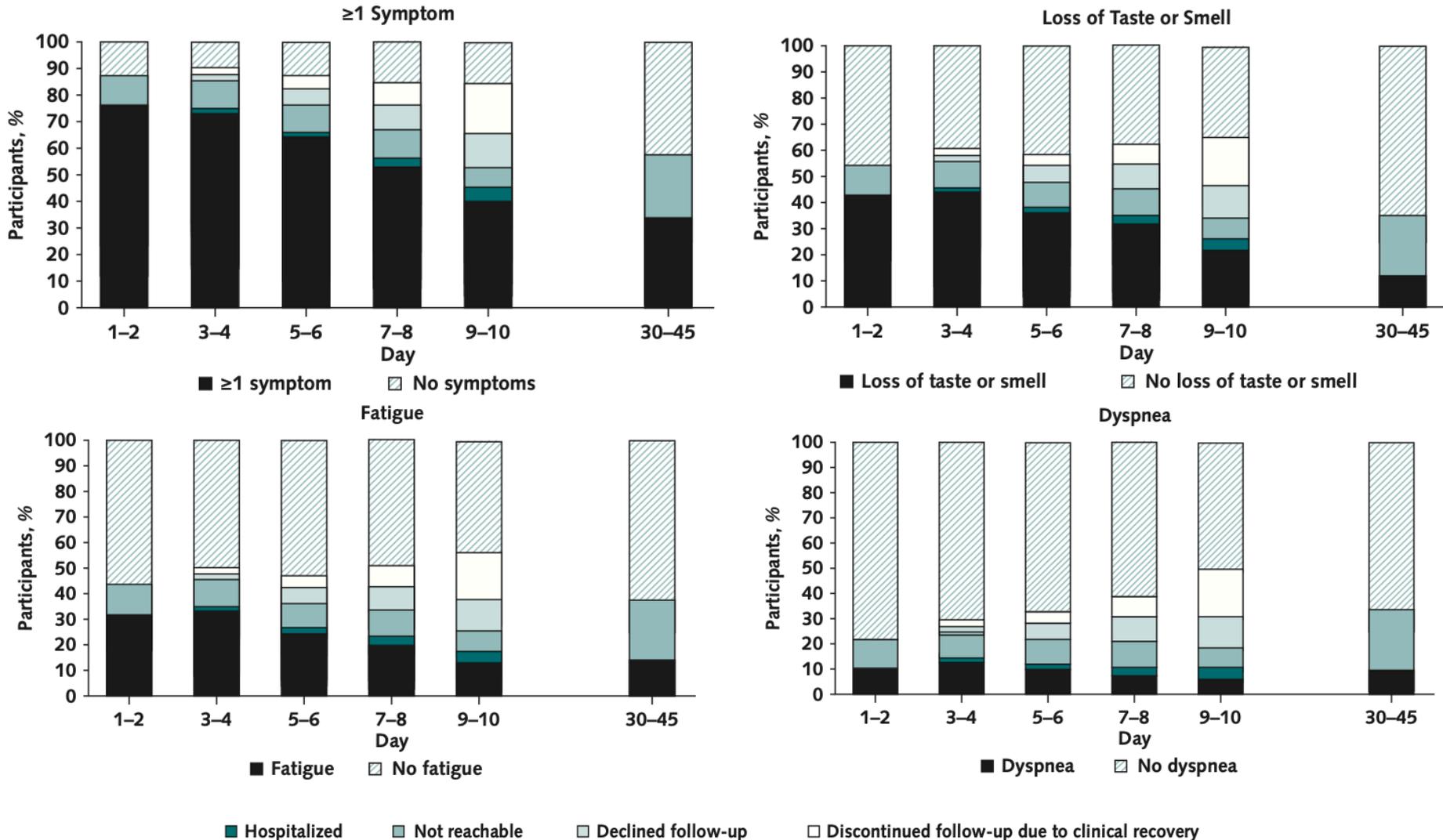


Figure 1. Probability of the sequential scenarios for outcomes after COVID-19 infection.

# COVID-19 Outcomes

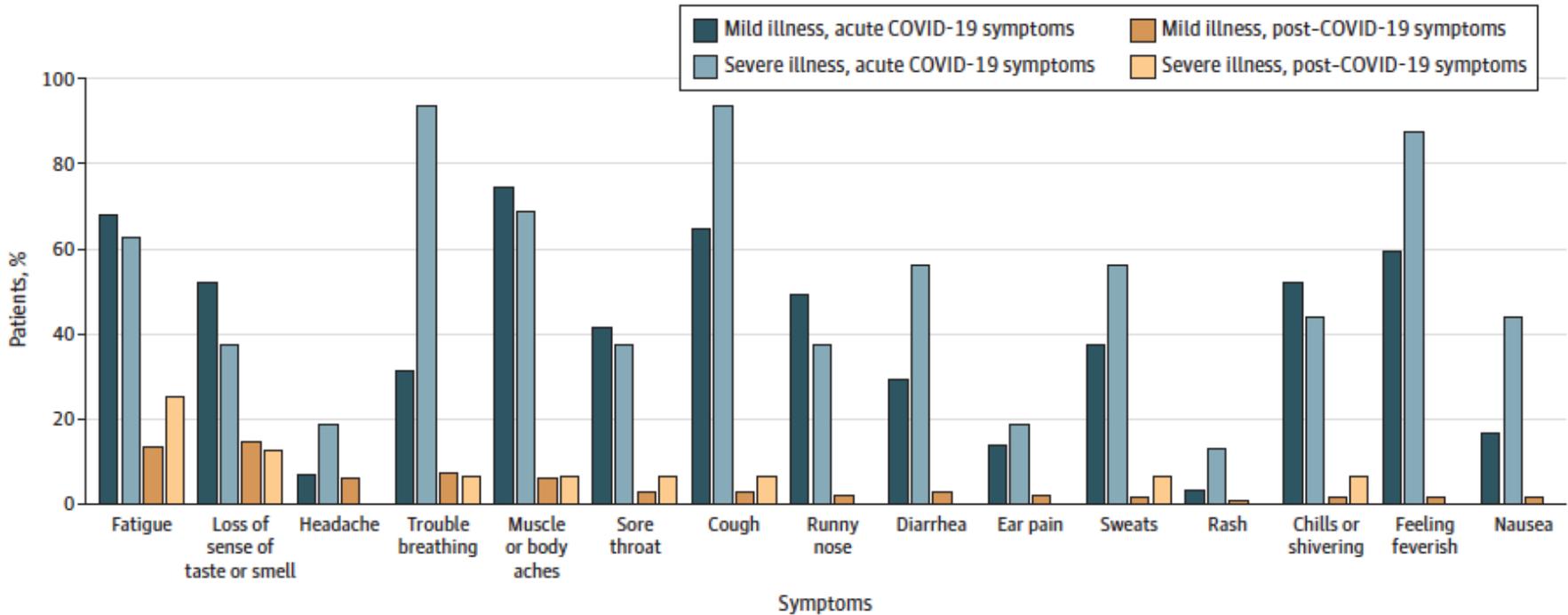


# Symptoms at 30-45 Days



# COVID-19 Acute and Chronic Symptoms

**B** Percentage of participants who reported COVID-19 symptoms during acute illness and at follow-up





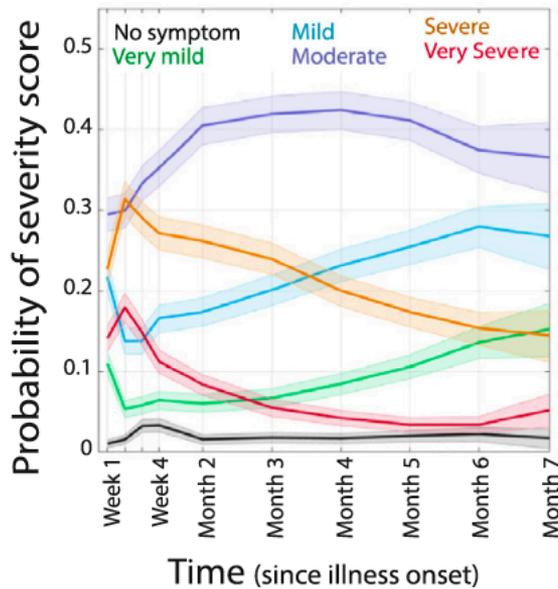
# COVID-19 Long-Term Symptoms

- 236,379 patients with COVID-19 followed for 6 months
- New diagnosis of neurologic/psychiatric disorder
  - Outpatient: 33% (13% new)
  - ICU: 46% (26% new)

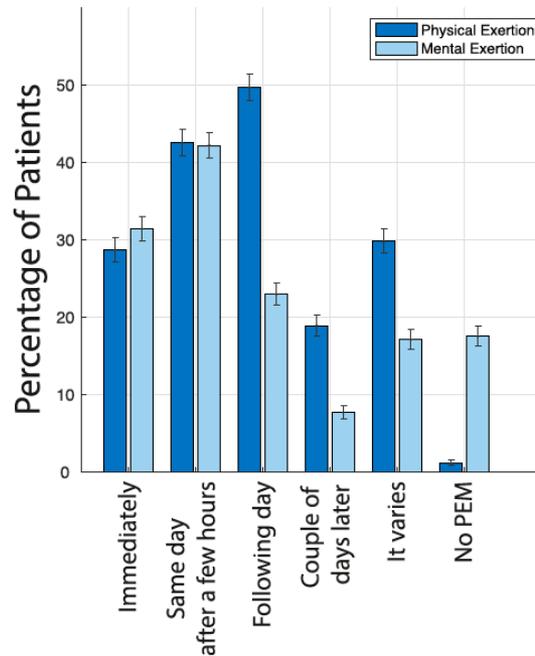
	COVID-19 vs influenza (N=105 579)*	
	HR (95% CI)	p value
Intracranial haemorrhage (any)	2.44 (1.89–3.16)	<0.0001
Intracranial haemorrhage (first)	2.53 (1.68–3.79)	<0.0001
Ischaemic stroke (any)	1.62 (1.43–1.83)	<0.0001
Ischaemic stroke (first)	1.97 (1.57–2.47)	<0.0001
Parkinsonism	1.42 (0.75–2.67)	0.19
Guillain-Barré syndrome	1.21 (0.72–2.04)	0.41
Nerve, nerve root, or plexus disorders	1.64 (1.50–1.81)	<0.0001
Myoneural junction or muscle disease	5.28 (3.71–7.53)	<0.0001
Encephalitis	1.70 (1.04–2.78)	0.028
Dementia	2.33 (1.77–3.07)	<0.0001
Mood, anxiety, or psychotic disorder (any)	1.46 (1.43–1.50)	<0.0001
Mood, anxiety, or psychotic disorder (first)	1.81 (1.69–1.94)	<0.0001
Mood disorder (any)	1.47 (1.42–1.53)	<0.0001
Mood disorder (first)	1.79 (1.64–1.95)	<0.0001
Anxiety disorder (any)	1.45 (1.40–1.49)	<0.0001
Anxiety disorder (first)	1.78 (1.66–1.91)	<0.0001
Psychotic disorder (any)	2.03 (1.78–2.31)	<0.0001
Psychotic disorder (first)	2.16 (1.62–2.88)	<0.0001
Substance use disorder (any)	1.27 (1.22–1.33)	<0.0001
Substance use disorder (first)	1.22 (1.09–1.37)	0.0006
Insomnia (any)	1.48 (1.38–1.57)	<0.0001
Insomnia (first)	1.92 (1.72–2.15)	<0.0001
Any outcome	1.44 (1.40–1.47)	<0.0001
Any first outcome	1.78 (1.68–1.89)	<0.0001

# Post-exertional malaise

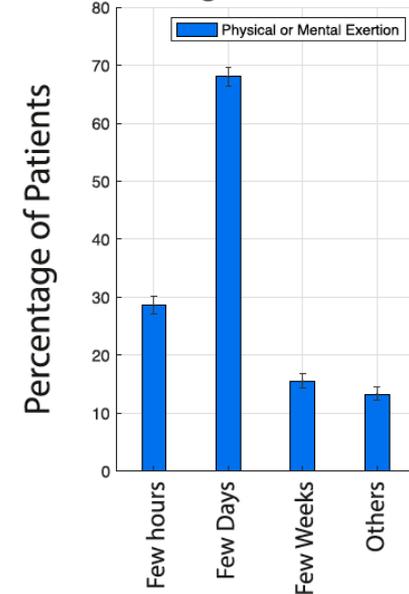
b. Symptom severity score over time



a. When does PEM start?

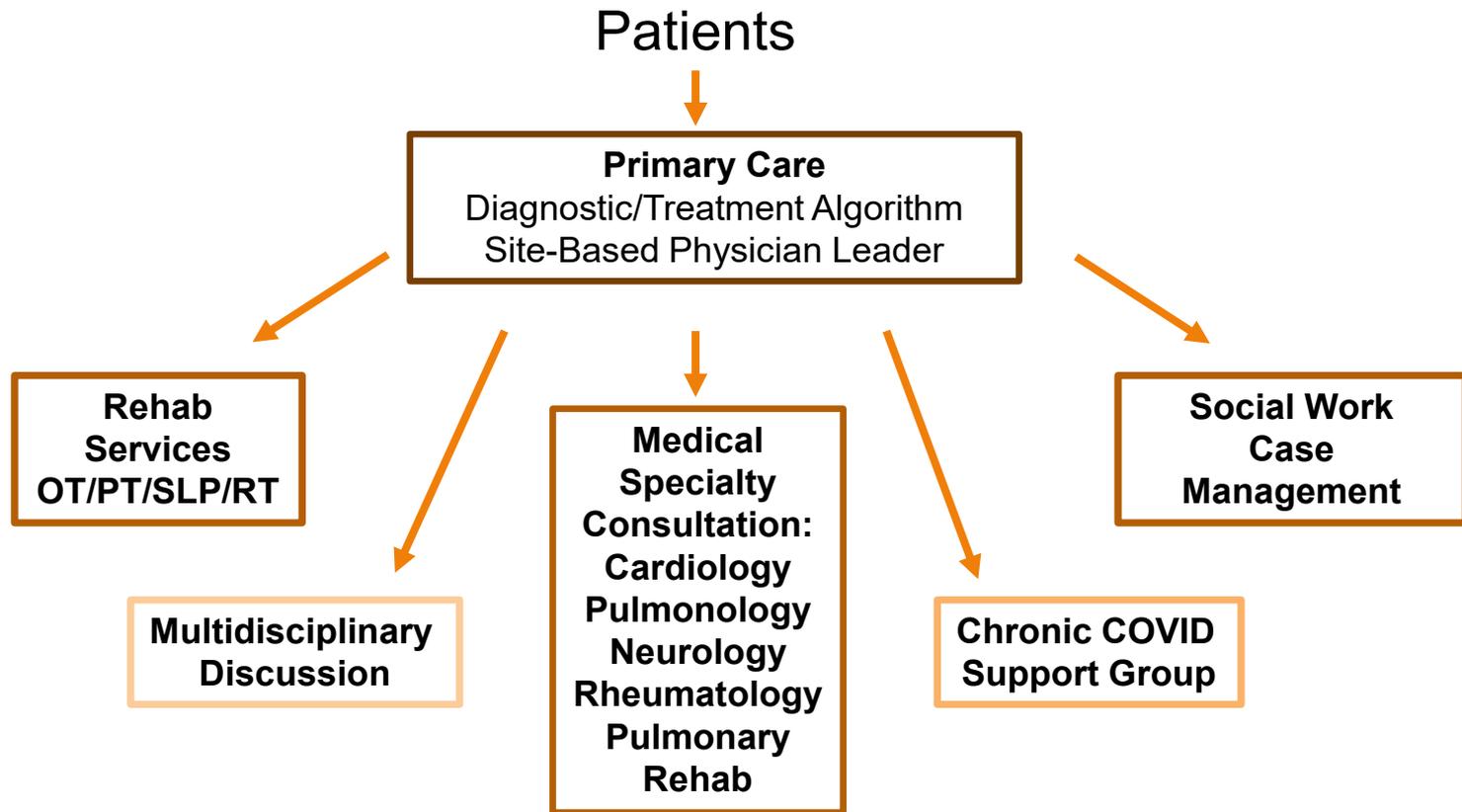


b. How long does PEM last?



Experience from Mt. Sinai suggests exercise intolerance should be treated cautiously

# UVM Health Network COVID-19 Recovery Program



# GUIDE FOR COVID SYMPTOM MGMT

SYMPTOMS THAT PATIENT IS REPORTING	IF PATIENT CALLS, ACTION THAT SHOULD BE TAKEN BY RN STAFF	PROVIDER ACTIONS
<b>Cardiac:</b> New chest pain or CHF symptoms (orthopnea, PND, DOE)	-Triage as per protocol for chest pain. Assess for acute vs chronic symptoms. Notify provider per protocol (high priority).	- consider emergent work up for myocarditis/myocardial infarction - consider urgent cardiology referral vs ER evaluation
<b>Neuro:</b> New neurologic or acute neurologic event	-Suspect acute CVA?—send patient to ER. - Triage symptoms for acute vs. chronic. -send to provider as high priority.	-If acute → ER -If subacute, consider referral to neurology.
<b>Pulmonary:</b> New or worsening breathlessness or persistent SpO <sub>2</sub> <92%	-Triage and send to provider as high priority	- Work up for PE or pneumonia - Consider referral to Pulmonary
<b>Pulmonary:</b> shortness of breath with resuming activities (poor exercise tolerance)	-Triage for acute symptoms -Schedule in person visit (assuming isolation is complete)	-Consider if there is need for acute work up. - If no acute issues, refer to Physical Therapy for guidance on resumption of activity
<b>Cardiology:</b> elevated HR with rest/exercise, orthostatic changes	-Triage for acute symptoms -Schedule in person visit (assuming isolation is complete)	-Consider if need for acute work up -Consider referral to PT



# Management continued...

<b>Neuro:</b> persistent headache, paresthesia, impaired balance,	-Triage for “red flag” symptoms per protocol	-Consider referral to Neurology -Consider referral to PT
<b>Neuro:</b> brain “fog”, organizational issues	-assess for acute issue	-refer to OT/SLP as indicated (see table below)
<b>Musculo-skeletal:</b> persistent muscle weakness, myalgias, joint pain	-Evaluate for “red flags” (red/hot joint)	-Referral to Rheumatology for more severe symptoms -Referral to PT for mild-moderate symptoms.
<b>Gastro-intestinal:</b> persistent diarrhea	-Evaluate for “red flags” (>10 stools/day, blood in stool)	- Evaluate for common causes (C Diff if recent antibiotics) -Consider referral to GI
<b>Psychological:</b> sleep disturbance, anxiety, depression, isolation, PTSD-like symptoms	-Assess for safety/acuity -schedule visit with PCP office (telehealth or in person)	-Consider need for medication <b>-Refer to Primary Care Medical Home Care Management to get connected with resources/ counseling.</b>



# Provider guide to rehab therapies: Call 847-1902 with questions

## Advocating for OP Services:

### After recovering from COVID- 19, are you having ongoing symptoms? Rehab Therapy might be able to help.

Please talk with your health care provider if you have any of the problems below. If you have any questions? Do you need help getting a referral? Call us at (802) 847-1902.

Are you having any of these problems?	Rehab Specialists
Fatigue during my usual personal care, home tasks, and when carrying out my work, school, community, or leisure responsibilities	Occupational Therapy (OT) referral
Problems with thinking, concentration, and memory that make it hard to do my personal care, home tasks, work, school, or leisure activities	
Fatigue when physically active	Physical Therapy (PT) referral
Balance problems, dizziness, or lightheadedness	
Weakness in arms or legs	
Unsure of how to safely get back to usual level of exercise after illness	
Swallowing problems	Speech-Language Pathology (SLP) referral
Voice problems (hoarseness or difficulty increasing volume)	
Difficulty putting thoughts into words	
Difficulty understanding information that I hear or read	
Problems with concentration, memory, or thinking that affect my communication	



# High Priority Treatment Goals

## OT

### Employment

- *Work simplification*
- *Strategies for managing fatigue for activities outside of work*
- *Return to work*

## PT

### Exercise Intolerance & Symptom Exacerbation

- *Stabilizing symptoms*
- *Gradual individualized endurance and strengthening exercise*
- *Close monitoring*
- *Goal to achieve highest level of fitness to enable life roles*

## SLP

### Swallowing, Voice Dysfunction, Cognitive Communication

- *Communication cognition strategies*
- *Return to school*



# Patient Education Tool

## POSITIONS TO EASE BREATHLESSNESS

Some positions may help your breathlessness. Try them to see which ones help. You can also try the breathing techniques, described on the next page, while in any of these positions.



### 1. High side lying

Lying on your side propped up by pillows, supporting your head and neck, with your knees slightly bent.



### 2. Forward lean sitting

Sitting at a table, lean forwards from the waist with your head and neck resting on the pillow, and your arms resting on the table. You can also try this without the pillows.



### 3. Forward lean sitting (no table in front)

Sitting on a chair, lean forwards to rest your arms on your lap or the armrests of the chair.

Primary Care

## Support for Recovery and Self-Management After COVID-19 Related Illness

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Provider Name: \_\_\_\_\_

### WHO IS THIS HANDOUT FOR?

This handout is a guide for adults who had COVID-19. It provides information on the following areas:

- Managing breathlessness
- Exercising safely
- Managing problems with attention, memory, and thinking clearly
- Managing self-care and fatigue

### MANAGING BREATHLESSNESS

It is common to experience breathlessness after being ill with COVID-19. You may notice you feel weaker and less fit. You can become breathless easily.



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# What to expect from outpatient therapy?

Scheduling: start with 1 or 2 therapies

Dysautonomia-like symptoms: start with PT

Utilizing vetted resources for pt. education

Collaborating with primary care and specialists

Ongoing clinician training as new evidence emerges

Tracking of patient results and program metrics

MRN	<input type="text"/>
DOB	<input type="text"/>
Patient name	<input type="text"/>

**Baseline Outpatient Questionnaire: Post-COVID**

Patient Name:  Age:  Date:

Please complete this survey so we know how best to help you.

**1. Breathlessness**

<b>Please rate any difficulty you are having with your breathing when:</b>	
<b>a. Sitting at rest</b>	
Now:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>
	No <b>Breathlessness</b> <span style="float: right;">Extreme <b>Breathlessness</b></span>
Pre-Covid:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>
<b>b. When dressing</b>	
Now:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>
	No <b>Breathlessness</b> <span style="float: right;">Extreme <b>Breathlessness</b></span>
Pre-Covid:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>
<b>c. Walking up stairs</b>	
Now:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>
	No <b>Breathlessness</b> <span style="float: right;">Extreme <b>Breathlessness</b></span>
Pre-Covid:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>

**2. Laryngeal/Airway Difficulties**

<b>Please rate any change in irritation of your throat, such as troublesome cough or noisy breathing.</b>	
Now:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>
	No <b>Impact</b> <span style="float: right;">Significant <b>Impact</b></span>
Pre-Covid:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>

**3. Voice**

<b>Please rate any change you or your family have noticed in your voice (i.e., difficulty being heard, singing, altered quality, voice tiring out by the end of the day, or an inability to alter the pitch of your voice).</b>	
Now:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>
	No <b>Impact</b> <span style="float: right;">Significant <b>Impact</b></span>
Pre-Covid:	0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>



Post-COVID  
Baseline  
Questionnaire



# Red Flags and Yellow Flags for Rehab Therapy

## RED FLAGS:

**STOP treatment.  
Contact referring  
provider and/or  
initiate emergency  
services**

- Cardiovascular: Unexplained chest pain, new tachycardia, dizziness
- Pulmonary symptoms: Sudden shortness of breath, chest pain, anxious, dizziness, palpitations, pneumonia, new severe breathlessness or worsening breathlessness, SpO2 < 92%
- New neurovascular or acute neurologic event
- New or worsening impairments in physical, cognitive or mental health status arising after critical illness and persisting beyond acute care hospitalization.

## YELLOW FLAGS:

**Contact referring  
provider for  
following  
symptoms:**

- Struggling with low mood, anxiety, post traumatic stress disorder, sleep (i.e. Counseling)
- Patient feeling overwhelmed needing assistance with managing resources, agencies, health coach (i.e. Community Health Consult otherwise known as medical home)
- Need for additional therapy disciplines based on provider guide and patient presentation



# Challenges:

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OP waits for specialty services can be very long

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Patient population is understandably frustrated with condition, limited answers, and access

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Preliminary information from NYC OP therapy clinics recovery can take many months, patients run out of insurance benefits

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Mental health care needs exceed supply in Vermont: try online resources or <https://covidsupportvt.org>



# Summary

## Message:

- Primary Care is the foundation of care for patients with prolonged COVID symptoms
- Comprehensive assessment in Primary Care can help educate patients and get them the resources and specialist evaluations needed.

## Communication Plan:

- Primary Care Medical Home Leadership Team
- Faculty Meetings
- Community-based provider outreach
- Grand Rounds
- UVM Health Network dissemination
- Medical Staff Office outreach
- Communications outreach



# COVID-19 Patient Advocacy and Research

COVID  
ADVOCACY X EXCHANGE



**PATIENT-LED  
RESEARCH  
COLLABORATIVE**

**PAF** Patient Advocate  
Foundation

**BODY POLITIC**

**COVID-19 SUPPORT GROUP**

**SURVIVOR**  
**CORPS**  
Empathize • Organize • Mobilize



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# Questions and Discussion from the group....



RECORDING TO BE STOPPED FOR CASE PRESENTATION

# Cases/HIPAA

## DO NOT INCLUDE:

- Name
- Address
- DOB
- Phone/Fax #
- Email address
- Social Security #
- Medical Record #



The discussion and materials included in this conference are confidential and privileged pursuant to 26VSA Section 1441-1443. This material is intended for use in improving patient care. It is privileged and strictly confidential and is to be used only for the evaluation and improvement of patient care.



# Case Presentation Format

1. Case presentation by a participant (a *real-world case, from the field*)  
Then
2. Clarifying questions about the case from group to case presenter  
Then
3. Ideas, suggestions, recommendations from participants  
Then
4. Ideas, suggestions, recommendations from ECHO faculty team  
Then
5. Additional discussion (All)  
Then
6. Summary of case discussion by course director

# Prep for Next Session

Prior to each session, if you have specific questions for ECHO faculty, please let us know and we will pass along ahead of time.

## 2021 PROGRAM SCHEDULE

<b>** SESSIONS ARE ON FRIDAYS FROM 12:00PM TO 1:00PM **</b>		
<b>DATES</b>	<b>SESSION/FACULTY</b>	<b>DIDACTIC TOPICS (in addition to case review)</b>
<b>September 10</b>	TeleECHO Session 1: David Kaminsky, MD Katherine Menson, DO	<b>Introduction to PASC (Long COVID)</b> <ul style="list-style-type: none"><li>• Definition</li><li>• Incidence</li><li>• Potential etiologies</li></ul>
<b>September 24</b>	TeleECHO Session 2: David Kaminsky, MD Katherine Menson, DO	<b>Chronic generalized symptoms</b> <ul style="list-style-type: none"><li>• Fatigue</li><li>• Chronic pain</li><li>• Loss of taste/smell</li><li>• Depression and anxiety</li></ul>
<b>October 8</b>	TeleECHO Session 3: David Kaminsky, MD Katherine Menson, DO	<b>Chronic neurologic symptoms</b> <ul style="list-style-type: none"><li>• Brain fog, decreased memory</li><li>• Headaches</li><li>• Sleep Disruption</li></ul>
<b>October 22</b>	TeleECHO Session 4: David Kaminsky, MD Katherine Menson, DO	<b>Chronic cardio-pulmonary symptoms</b> <ul style="list-style-type: none"><li>• Cough and/or Dyspnea</li><li>• Chest Pain</li><li>• Venous thromboembolism</li></ul>



# Conclusion

- Slides are posted at [www.vtahec.org](http://www.vtahec.org)
- Volunteers to present cases (this is key to the Project ECHO model)
  - Please submit cases to [Mark.Pasanen@uvmhealth.org](mailto:Mark.Pasanen@uvmhealth.org)
- Please complete evaluation survey after each session
- Once your completed evaluation is submitted, CE information will be emailed to you.
- Please contact us with any questions, concerns, or suggestions
  - [Mark.Pasanen@uvmhealth.org](mailto:Mark.Pasanen@uvmhealth.org)
  - [Elizabeth.Cote@uvm.edu](mailto:Elizabeth.Cote@uvm.edu)

