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

Session 3: October 8, 2021

Course Director: Mark Pasanen, MD
ECHO Director: Elizabeth Cote
Series Faculty: David Kaminsky, MD
Katherine Menson, DO
Suzanne Lawrence, DPT
Ashley Couture, MS, CCC-SLP
Learning objectives for this ECHO series include the ability to:

<table>
<thead>
<tr>
<th>Recognize</th>
<th>Implement</th>
<th>Assist</th>
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<tbody>
<tr>
<td>Recognize the broad range of chronic symptoms after SARS-CoV-2 infection</td>
<td>Implement diagnostic and treatment strategies for varied presentations</td>
<td>Assist patients in the development of comprehensive, multi-disciplinary care plans</td>
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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.
Post-Acute Sequelae of SARS-CoV-2 (PASC)

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University of Vermont Medical Center
Ashley.couture@uvmhealth.org

No conflicts to disclose.

Session Objectives:

• Identify common symptoms of PASC impacting neurological, cognitive-communication functioning
• Describe the impact of these symptoms for patients on daily functioning and QOL
• Review role of OT and SLP in providing intervention and EBM approaches
PASC Brain Fog

• “Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning” (WHO, Clinical Case Definition, 2021)

• Reduced attention, executive functioning, problem solving, decision making, memory and changes in speech-language (Davis, 2021)

• Headaches, dizziness, fatigue

• Significant functional impact with reduced QOL (Seeble, 2021)

- “Am I ever going to be a good student again?”
- “I forget how to do normal routines like running a meeting at work“
- “I can't follow plots in movies or tv shows, I have to write everything down, have to remember to look at notes”
Proposed Neuro-PASC Diagnostic Criteria
(Moghimi, Current Neur. Neurosc. Reports 2021)

<table>
<thead>
<tr>
<th>Neuro-PASC DIAGNOSTIC CRITERIA</th>
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<td>At least 2 or 3 of following manifestations are also required in a single category</td>
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</table>

- **Neurologic:** Smell/taste disturbance, myalgia, muscle weakness, motor disturbance, generalized hyperalgesia, neuromuscular pain, new headaches, disturbed sleep patterns, unrefreshing sleep drowsiness
- **Neurocognitive:** Difficulty thinking/processing, short-term memory loss, difficulty to focus, depression/anxiety, hypersensitivity to noise/light, tinnitus, double vision, PTSD
- **Neuroendocrine:** Thermostatic instability, anorexia
- **Autonomic dysfunction:** Orthostatic intolerance, cardiovascular, respiratory gastro-intestinal (GI), genitourinary (GU)
- **Immune system:** Fever or chills, flu-like symptoms, susceptibility to virus, sore throat, lymph node pain/tenderness, sensitivity to chemicals (foods, medications, or odors)
- **Laboratory findings:** Consistent with a hyperinflammatory and/or hypercoagulability conditions kidney insufficiency

- **ADL reduction:** A substantial reduction or impairment in the ability to engage in pre-illness levels of occupational, educational, social, or personal activities that persists for more than 4-6 weeks after diagnosis

- **Fatigue:** The fatigue is of new or definite onset (not lifelong) and is not the result of ongoing excessive exertion. The fatigue is not substantially alleviated by rest and is often profound.

- **Neuromuscular symptoms:** Chronic, debilitating pain, numbness or weakness in their hands, feet, arms and legs due to unexplained nerve damage.

- **Neuropsychiatric symptoms:** dementia, delirium, anxiety, psychotic disorder, depression, and post-traumatic stress disorder

**Documented history of COVID19 according to WHO criteria or SARS-CoV2 infection defined by the specific diagnostic techniques AND Negative PCR**

**Exclusion Criteria**
- Medical conditions causing chronic fatigue
- Psychiatric disorders
- Primary brain disorders
- Substance abuse
- Eating disorder
- Active process of disease
- History of depression and anxiety
# Post Intensive Care Syndrome (PICS) vs. PASC

<table>
<thead>
<tr>
<th>PICS Post COVID-19:</th>
<th>PACS Post Acute COVID-19:</th>
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<tbody>
<tr>
<td>● Anxiety</td>
<td>● Anxiety</td>
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<tr>
<td>● Depression</td>
<td>● Depression</td>
</tr>
<tr>
<td>● PTSD</td>
<td>● PTSD</td>
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<tr>
<td>● Brain fog: ↓ executive function, memory, attention</td>
<td>● Brain fog: ↓ executive function, memory, attention</td>
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<tr>
<td>● Fatigue</td>
<td>● Fatigue</td>
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<tr>
<td>● Muscle weakness</td>
<td>● Muscle weakness</td>
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<tr>
<td>● Difficulty breathing</td>
<td>● Breathlessness</td>
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<td></td>
<td>● Sleep disturbances</td>
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<td></td>
<td>● Palpations, chest pain</td>
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Symptoms Remaining after 6 months:

(Davis, 2021)
Reported Neuro-Cognitive Symptoms: (Davis, 2021)

Cognitive function:

Memory:

Speech/ language:
Co-occurrence: Neuropsychiatric and Brain Fog?

Emotion/Mood:

(Davis, 2021)
Co-occurrence: Neuropsychiatric and Brain Fog?

Sleep:

(Davis, 2021)
Impact of Memory and Cognitive Dysfunction on Daily Life

(Davis, 2021)
Impact on Return to Work

(Davis, 2021)
UVMMC Rehab Therapy: PASC

(Figure 1)

(Figure 2)

(Figure 3)
## Occupational Therapy (OT) and Speech-Language Pathology (SLP) Evaluation

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Purpose</th>
<th>OT</th>
<th>SLP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COVID intake questionnaire: baseline &amp; end of tx</strong></td>
<td>PASC Sx Severity Score &amp; need other services</td>
<td>X</td>
<td>X</td>
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<tr>
<td></td>
<td>Quality of Perceived Health</td>
<td></td>
<td></td>
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<tr>
<td><strong>VS &amp; RPE and or Dyspnea</strong></td>
<td>Measure pt’s activity tolerance</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Primary symptom VAS (0-10)</strong></td>
<td>Utilized to gauge pt’s tolerance to activity or cognitive load</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>PESE Questionnaire</strong></td>
<td>Identifies PEM</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Activity Tracking Tool</strong></td>
<td>Correlate activity energy expenditures to sx severity</td>
<td></td>
<td></td>
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<tr>
<td><strong>COPM and PSFS</strong></td>
<td>Utilized to develop individual treatment program and response to treatment</td>
<td>X</td>
<td></td>
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<tr>
<td><strong>MOCA, Trail Making Test A&amp;B</strong></td>
<td>Identify ↓ orientation, memory, executive function impacts ADLs</td>
<td>X</td>
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<tr>
<td><strong>Language: verbal expression, comprehension, reading and writing</strong></td>
<td>Evaluation of word finding, discourse formulation, information processing for daily activities including school and work.</td>
<td></td>
<td>X</td>
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<tr>
<td><strong>Cognitive Communication: attention/concentration, memory, executive function</strong></td>
<td>Identify impairments in orientation, memory, executive function impacting daily communication demands</td>
<td></td>
<td>X</td>
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### PASC Brain Fog

**High Priority Treatment Goals**

**Patient Centered/Participation Focused**

#### OT

**Self Care, Usual Activities & Employment**

- *Work simplification*

- *Strategies for managing fatigue for daily routines and activities (iADL’s)*

- *Return to work*

#### SLP

**Communication Cognitive Function, Swallowing, Voice Disorders**

- *Communication cognition strategies*

- *Return to school*
## Interventions

### OT

**Self Care, Usual Activities & Employment**
- Quantify and build self-monitoring of work, home, school demands
- Simplification through modification of tasks, use of aids, minimizing physical demands
- Energy conservation strategies
- Compensatory strategies for executive function demands of daily activities

### SLP

**Communication Cognitive Function, Swallowing, Voice Disorders**
- Compensatory strategies to aid concentration for communication, reading, writing
- Energy conservation strategies to manage communication demands
- Compensatory strategies for executive function
- Word finding strategies

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**Use 4 P’s principles: prioritize, plan, pace & positioning to balance work with energy window**

**Maximize mood, sleep, nutrition, exercise safely**
Return to Work Guidelines

Consider energy conservation strategies:

1. Graded return to work:
2. Adjust work activities and energy demands
3. Use equipment to save energy
4. Add additional cognitive breaks (start every 45 min.)
5. Adjust work environment
6. Work from home
7. Referral to OT, SLP may need Vocational rehab

(Herrera, PM&R 2021)
Challenges:

Outcomes in therapy can be impacted by fatigue and psycho-emotional (PASC related & pre existing) challenges

Patients with PASC may have multiple needs with multiple providers and ‘brain fog’ makes management of multiple providers challenging for the patient and for the providers

‘Brain fog’ alters a deep sense of self and abilities for many patients and the real adjustments required to be successful take a psychological toll

Research publications and consumer feedback suggests that better planning is needed for a graduated or graded return to work plan considering both the patient’s energy window and work demands.

There are VT/ NY patient consumers who remain symptomatic after 13 months. More research is needed to identify best treatment; ought they to expect recovery? Are they supported to pursue disability benefits if needed?
Summary

Message:

- Neurocognitive symptoms are prevalent in patients with PASC, pattern and time-lines are highly variable and these symptoms have significant impact on function and QOL.
- OT and SLP provide patient centered intervention that empowers patients with strategies to be successful with daily communication and thinking demands.
- Due to brain fog – pt. benefit from clear, consistent communication and collaboration between multiple providers and case management support where needed.
- PASC symptoms of mood disturbance, sleep disruption and fatigue intersect with ‘brain fog’ and effective intervention needs to address ALL of these things.
- Patients experiencing ‘brain fog’ benefit from encouragement and reminders that cognitive communication recovery takes time, patience, slow and steady pace.
- Monitoring for PESE or PEM is important, when present should guide clinicians to treat cautiously.
- Recommend gradual resumption of exercise, activity and cognitive loads to avoid PEM and PASC and symptom flare up.

Communication Plan:

- Inservice/education sessions
- Outreach
- VT AOTA, VSHA
COVID-19 Patient Advocacy and Research

COVID19SurvivorSupport@UVMHealth.org

UVM Health Network COVID 19 Recovery Web site
https://www.uvmhealth.org/coronavirus/covid-19-recovery-program

Mental health service try online resources
or https://covidsupportvt.org
References


**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

**SESSIONS ARE ON FRIDAYS FROM 12:00PM TO 1:00PM**

<table>
<thead>
<tr>
<th>DATES</th>
<th>SESSION/FACULTY</th>
<th>DIDACTIC TOPICS (in addition to case review)</th>
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<tbody>
<tr>
<td>September 10</td>
<td>TeleECHO Session 1: David Kaminsky, MD Katherine Menson, DO</td>
<td>Introduction to PASC (Long COVID)</td>
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<tr>
<td></td>
<td></td>
<td>· Definition</td>
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<td></td>
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<td>· Incidence</td>
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<td>· Potential etiologies</td>
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<td>September 24</td>
<td>TeleECHO Session 2: David Kaminsky, MD Katherine Menson, DO</td>
<td>Chronic generalized symptoms</td>
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<tr>
<td></td>
<td></td>
<td>· Fatigue</td>
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<td></td>
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<td>· Chronic pain</td>
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<td></td>
<td></td>
<td>· Loss of taste/smell</td>
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<td></td>
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<td>· Depression and anxiety</td>
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<td>October 8</td>
<td>TeleECHO Session 3: David Kaminsky, MD Katherine Menson, DO</td>
<td>Chronic neurologic symptoms</td>
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<tr>
<td></td>
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<td>· Brain fog, decreased memory</td>
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<td></td>
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<td>· Headaches</td>
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<td>· Sleep Disruption</td>
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<td>October 22</td>
<td>TeleECHO Session 4: David Kaminsky, MD Katherine Menson, DO</td>
<td>Chronic cardio-pulmonary symptoms</td>
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<td></td>
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<td>· Cough and/or Dyspnea</td>
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<td>· Chest Pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>· Venous thromboembolism</td>
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Conclusion

• Slides are posted at www.vtahec.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
  • Elizabeth.Cote@uvm.edu