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:

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

Katherine Menson, DO
Assistant Professor
Larner College of Medicine at the University of Vermont
Katherine.menson@uvmhealth.org

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

27-year-old male, marathon runner

Late March 2020 developed fevers, malaise, anosmia

Delay in testing, 4 weeks later negative, CXR normal

Recovery of fevers, anosmia after 2 weeks

Tried to return to work

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

Referred to my office for evaluation

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

Exam: Tachycardia

Spirometry, DLCO, 6MWT: Normal

CT Chest PE-Protocol: Normal

ECG: Sinus Tachycardia

Stress Test: Normal

What next?
COVID-19 Outcomes

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

Nalbandian, Nature Med April 2021
Symptoms at 30-45 Days

≥1 Symptom

Loss of Taste or Smell

Fatigue

Dyspnea

Participants, %

1-2  3-4  5-6  7-8  9-10  30-45

≥1 symptom  No symptoms

Loss of taste or smell  No loss of taste or smell

Fatigue  No fatigue

Dyspnea  No dyspnea

Hospitalized  Not reachable  Declined follow-up  Discontinued follow-up due to clinical recovery

Nehme, Annals December 2020
COVID-19 Acute and Chronic Symptoms

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

- Mild illness, acute COVID-19 symptoms
- Severe illness, acute COVID-19 symptoms
- Mild illness, post-COVID-19 symptoms
- Severe illness, post-COVID-19 symptoms

Symptoms:
- Fatigue
- Loss of sense of taste or smell
- Headache
- Trouble breathing
- Muscle or body aches
- Sore throat
- Cough
- Runny nose
- Diarrhea
- Ear pain
- Sweats
- Rash
- Chills or shivering
- Feeling feverish
- Nausea
COVID-19 Long-Term Symptoms

Possible Mechanisms

- Endovascular dysfunction
- Microthrombosis
- Neuroinflammation
- Carotid body dysfunction
- Oxidative stress
- Mitochondrial dysfunction
- Beta-2 adrenergic receptor dysfunction

Lopez-Leon, MedRxiv, Jan 2021
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)

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

Experience from Mt. Sinai suggests exercise intolerance should be treated cautiously
UVM Health Network COVID-19 Recovery Program

Patients

Primary Care
Diagnostic/Treatment Algorithm
Site-Based Physician Leader

Rehab Services
OT/PT/SLP/RT

Medical Specialty Consultation:
Cardiology
Pulmonology
Neurology
Rheumatology
Pulmonary Rehab

Multidisciplinary Discussion

Social Work Case Management

Chronic COVID Support Group
<table>
<thead>
<tr>
<th>SYMPTOMS THAT PATIENT IS REPORTING</th>
<th>IF PATIENT CALLS, ACTION THAT SHOULD BE TAKEN BY RN STAFF</th>
<th>PROVIDER ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cardiac:</strong> New chest pain or CHF symptoms (orthopnea, PND, DOE)</td>
<td>- Triage as per protocol for chest pain. Assess for acute vs chronic symptoms. Notify provider per protocol (high priority).</td>
<td>- Consider emergent work up for myocarditis/myocardial infarction - Consider urgent cardiology referral vs ER evaluation</td>
</tr>
<tr>
<td><strong>Neuro:</strong> New neurologic or acute neurologic event</td>
<td>- Suspect acute CVA? — send patient to ER. - Triage symptoms for acute vs. chronic. - Send to provider as high priority.</td>
<td>- If acute ➔ ER - If subacute, consider referral to neurology.</td>
</tr>
<tr>
<td><strong>Pulmonary:</strong> New or worsening breathlessness or persistent SpO2 &lt; 92%</td>
<td>- Triage and send to provider as high priority</td>
<td>- Work up for PE or pneumonia - Consider referral to Pulmonary</td>
</tr>
<tr>
<td><strong>Pulmonary:</strong> Shortness of breath with resuming activities (poor exercise tolerance)</td>
<td>- Triage for acute symptoms - Schedule in person visit (assuming isolation is complete)</td>
<td>- Consider if there is need for acute work up - If no acute issues, refer to Physical Therapy for guidance on resumption of activity</td>
</tr>
<tr>
<td><strong>Cardiology:</strong> Elevated HR with rest/exercise, orthostatic changes</td>
<td>- Triage for acute symptoms - Schedule in person visit (assuming isolation is complete)</td>
<td>- Consider if need for acute work up - Consider referral to PT</td>
</tr>
</tbody>
</table>
Management continued...

| **Neuro**: persistent headache, paresthesia, impaired balance, | -Triage for “red flag” symptoms per protocol | -Consider referral to Neurology  
-Consider referral to PT |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neuro</strong>: brain “fog”, organizational issues</td>
<td>-assess for acute issue</td>
<td>-refer to OT/SLP as indicated (see table below)</td>
</tr>
</tbody>
</table>
| **Musculo-skeletal**: 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. |
| **Gastro-intestinal**: 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 |
| **Psychological**: sleep disturbance, anxiety, depression, isolation, PTSD-like symptoms | -Assess for safety/acute  
-schedule visit with PCP office (telehealth or in person) | -Consider need for medication  
-Refer to Primary Care Medical Home Care Management to get connected with resources/counseling. |
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.

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

**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.
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
Baseline Outpatient Questionnaire: Post-COVID

Patient Name: ___________________ Age: ___ Date: ___

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

1. **Breathlessness**

   Please rate any difficulty you are having with your breathing when:

   a. Sitting at rest
   
<table>
<thead>
<tr>
<th>Rating</th>
<th>No Breathlessness</th>
<th>Extreme Breathlessness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
<tr>
<td>Pre-Covid</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
</tbody>
</table>

   b. When dressing
   
<table>
<thead>
<tr>
<th>Rating</th>
<th>No Breathlessness</th>
<th>Extreme Breathlessness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
<tr>
<td>Pre-Covid</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
</tbody>
</table>

   c. Walking up stairs
   
<table>
<thead>
<tr>
<th>Rating</th>
<th>No Breathlessness</th>
<th>Extreme Breathlessness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
<tr>
<td>Pre-Covid</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
</tbody>
</table>

2. **Laryngeal/Airway Difficulties**

   Please rate any change in irritation of your throat, such as troublesome cough or noisy breathing.

<table>
<thead>
<tr>
<th>Rating</th>
<th>No Impact</th>
<th>Significant Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
<tr>
<td>Pre-Covid</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
</tbody>
</table>

3. **Voice**

   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).

<table>
<thead>
<tr>
<th>Rating</th>
<th>No Impact</th>
<th>Significant Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Now</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
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<tr>
<td>Pre-Covid</td>
<td>0 □ 1 □ 2 □ 3 □ 4 □ 5 □ 6 □ 7 □ 8 □ 9 □ 10 □</td>
<td></td>
</tr>
</tbody>
</table>
Red Flags and Yellow Flags for Rehab Therapy

**RED FLAGS:**

- 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:**

- 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:

OP waits for specialty services can be very long

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

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

Mental health care needs exceed supply in Vermont: try online resources or [https://covidsupportvt.org](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 EXCHANGE

PATIENT-LED RESEARCH COLLABORATIVE

PAF Patient Advocate Foundation

Survivor Corps

BODY POLITIC

COVID-19 SUPPORT GROUP

The University of Vermont
Larner College of Medicine
Office of Primary Care & AHEC Program

ECHO University of Vermont
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

<table>
<thead>
<tr>
<th><strong>SESSONS ARE ON FRIDAYS FROM 12:00PM TO 1:00PM</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DATES</strong></td>
</tr>
</tbody>
</table>
| September 10 | TeleECHO Session 1: David Kaminsky, MD Katherine Menson, DO | Introduction to PASC (Long COVID)  
- Definition  
- Incidence  
- Potential etiologies |
| September 24 | TeleECHO Session 2: David Kaminsky, MD Katherine Menson, DO | Chronic generalized symptoms  
- Fatigue  
- Chronic pain  
- Loss of taste/smell  
- Depression and anxiety |
| October 8 | TeleECHO Session 3: David Kaminsky, MD Katherine Menson, DO | Chronic neurologic symptoms  
- Brain fog, decreased memory  
- Headaches  
- Sleep Disruption |
| October 22 | TeleECHO Session 4: David Kaminsky, MD Katherine Menson, DO | Chronic cardio-pulmonary symptoms  
- Cough and/or Dyspnea  
- Chest Pain  
- Venous thromboembolism |
Conclusion

• Slides are posted at www.vtahec.org

• Volunteers to present cases (this is key to the Project ECHO model)
  • Please submit cases to 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
  • Elizabeth.Cote@uvm.edu