Resuming Physical Activity & Exercise

Provincial COVID Rehabilitation Provider Education Sessions

Kaitlin Troop, Lauren Singh, Katherine Reagan
June 22, 2021
Land Acknowledgement

We acknowledge that we are gathered virtually today on the Territories of Treaty 6, Treaty 7, and Treaty 8 and Métis Regions 1, through 6.

These territories are home to many Indigenous Peoples, including the Blackfoot, Cree, Dene, Saulteaux, Ojibwe, Stoney Nakota Sioux, and Tsuut’ina peoples, the Métis Nations of Alberta and the 8 Métis Settlements.

We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to moving forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.
Thank You

Andrea Pearce
Dana Downing
Fern Yee
Heather Zygun
Kira Ellis
Margie Hass
Safieh Rajan
Sarah Arsenault
William Tung
Katherine Reagan
Outline

• Biopsychosocial Considerations
• Physical Activity vs. Exercise
• Key Considerations for Resuming Exercise after COVID-19
• Foundational Elements of Treatment
• Treatment Considerations (Community & Acute Care)
• Case Scenarios
Biopsychosocial Considerations

Biological
- Age, Gender, Genetics
- Physiologic Reactions
- Tissue Health

Psychological
- Mental Health
- Emotional Health
- Beliefs & Expectations

Sociological
- Interpersonal Relationships
- Social Support Dynamics
- Socioeconomics
Physical Activity vs. Exercise

- **Physical Activity** – “Any bodily movement produced by skeletal muscles that results in energy expenditure.” (Caspersen et al., 1985)
  - E.g. Activities of daily living, household and occupational activities, sports, conditioning, etc.

- **Exercise** – “A subset of physical activity that is planned, structured and repetitive with the objective being the improvement or maintenance of physical fitness.” (Caspersen et al., 1985)
  - E.g. Aerobic training, strength, balance, ROM, etc.
Key Considerations for Resuming Activity & Exercise:

1. Post-Exertional Symptom Exacerbation
2. Cardiac Impairment
3. Significant Dyspnea
4. Exertional Oxygen Desaturation
5. Dysautonomia and Orthostatic Intolerances
Foundational Elements of Treatment

Adapted from World Physiotherapy Briefing Paper on Long COVID, 2021
Post-Exertional Symptom Exacerbation

Definition:
• Triggering or worsening of symptoms following physiological stress and/or cognitive activity (Mateo, 2020)
• Relapse/remitting/episodic presentation

Screen:
• DePaul Symptom Questionnaire- PEM Subscale

Intervention:
• Guided by symptom-titrated physical activity
• Breathing foundations
• Rest as an activity, energy budgeting/optimization, activity log
Post-Exertional Symptom Exacerbation

PEM occurred alongside a reduced capacity to work, be physically active, and function both physically and socially (Twomey et al, 2021)
MEA Statement: Graded Exercise Therapy is not a safe and effective treatment for ME/CFS or Long Covid

March 12, 2021

1.11.16 Do not offer people with ME/CFS:

- any therapy based on physical activity or exercise as a treatment or cure for ME/CFS
- generalised physical activity or exercise programmes – this includes programmes developed for healthy people or people with other illnesses
- any programme based on fixed incremental increases in physical activity or exercise, for example graded exercise therapy
- structured activity or exercise programmes that are based on deconditioning as the cause of ME/CFS
Cardiac Impairment

Cardiac Symptoms & Possible Red Flags:

- Palpitations
- Inappropriate tachycardia
- Chest pain
- Marked reduction in fitness
- Disproportionate breathlessness

* Consider referral back to primary care provider or cardiologist if required.
Cardiac Impairment

Definition: An elevation in serum troponin—*up to 45% of inpatients* (Prasitlumkum et al., 2020)

Screen:

- *Can you feel your heart racing with simple activities?*
- *Do you have chest pain with rest/exertion?*
- *Do you feel unwell when sitting upright or in standing?*
Cardiac Impairment

Intervention:
• Refer to cardiac rehab, if appropriate & where available
• Conservative intervention
  • No recommended HR target--- start at PEM intensity and titrate up as tolerated
  • Work below anaerobic threshold (~60% of HR max):
    • Estimated: \((220 - \text{age}) \times 0.55 = \text{anaerobic threshold in beats per minute}\)
• Follow Return to Sport guidelines, ACSM guidelines
• Consult cardiology for individualized parameters
Continued monitoring for potential delayed development of cardiac dysfunction when physical activity interventions are commenced.

Possibility of persisting low-grade cardiac injury should be considered, especially if facilitating a return to work (strenuous work).

World Physiotherapy Briefing Paper on Long COVID, 2021
Exertional Oxygen Desaturation

Quantifying exertional desaturation:

- During mild exertion, **a fall in oxygen saturation of ≥5% or below 90% for patients without known lung pathology** (88% with known lung pathology) is considered abnormal (ATS/ACCP 2003, Dempsey & Wagner 1985, Bota & Rowe 1995).

**Screen:**
- 6 Minute Walk Test
- 1 Minute Sit to Stand Test
- 2 Minute Step Test

**Exercise caution with patients screening positive for PEM/PESE**
Exertional Oxygen Desaturation

Intervention:

• Cannot train hypoxic or hypoxemic patient
• Rehabilitation should aim to prevent desaturation on exertion
  • Breathing retraining
  • Education and breath awareness
  • Introduce activity with breath control
• Consult or refer to local Pulmonary Rehabilitation program
Exertional Oxygen Desaturation

If you are treating an individual with supplemental oxygen:
- Ensure titration guidelines are provided
- Use continuous flow (if available)
- Use lowest flow to maintain saturation >88%
- Review AHS Oxygen modules on MyLearningLink
Pulse Oximetry & Exertional Oxygen Desaturation

If your patient is desaturating:
• Check warmth of hands/ circulation
• Nail polish/finger clubbing/ Raynaud's
• Use a head probe (peripheral vs. central assessment)
Dyspnea (ATS, 1999):

• Sensations experienced by individuals who complain of unpleasant or uncomfortable respiratory sensations.

• Derived from interactions among multiple physiological, psychological, social, and environmental factors, and may induce secondary physiological and behavioural responses.

• “difficult, laboured, uncomfortable breathing, an awareness of respiratory distress, air hunger”
Dyspnea

Dyspnea interferes with general activity more than pain (Chen et al, 2018)
## Significant Dyspnea

- Patients can self refer to rehabilitation

### IMPAIRMENT

<table>
<thead>
<tr>
<th>Significant Dyspnea</th>
</tr>
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<tbody>
<tr>
<td>*Consider recent medical clearance, baseline status and/or pre-existing conditions when determining if patient requires further medical investigation.</td>
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</tbody>
</table>

### SCREENING QUESTIONS

<table>
<thead>
<tr>
<th>Grade</th>
<th>Degree of breathlessness related to activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Are you ever troubled by breathlessness during non-strenuous activity?</td>
</tr>
<tr>
<td>1</td>
<td>Are you short of breath when hurrying on level ground or walking up a slight hill?</td>
</tr>
<tr>
<td>2</td>
<td>Do you have to walk slower than most people on level ground or do you have to stop after 15 minutes of walking at your own pace?</td>
</tr>
<tr>
<td>3</td>
<td>Do you have to stop for breath after walking about 100 yards or after a few minutes on level ground?</td>
</tr>
<tr>
<td>4</td>
<td>Are you too breathless to leave the house, or breathless when undressing?</td>
</tr>
</tbody>
</table>

### OUTCOME

- **Score of 4:** Refer back to primary care physician for further investigation (i.e. PFT, chest x-ray, etc.).
- **Score of ≤ 3:** Proceed with assessment for exertional oxygen desaturation.
Breathing Pattern Disorders: Hyperventilation

ORIGIN:
• Abnormal ventilatory control (central)
• Failure of inhibitory systems

Results of Hyperventilation-induced Hypocapnia (Castello, 2021)
• Tachycardia
• Chest pain
• Exercise intolerance
• Fatigue
• Dizziness
• Syncope on exertion
Significant Dyspnea:

Intervention

• Symptom stabilization

• Breathing retraining goals:
  • Reduce hyperinflation
  • Reduce respiratory rate
  • Reset Acid/Base balance
  • Break habitual pattern
  • Increase stimuli tolerance
  • Create self-efficacy
Breathing Retraining: *Communication & Education*

PR Breathing Foundations:
- Landmark diaphragm
- Belly dominant
- Slow rate
- Directional breathing
- Supported positioning
- Quiet breathing (should be nose dominant in non-diseased population)

**Exercise should not exceed 3/10 on Borg if patient is unable to demonstrate maintenance of breath control**
Breathing Retraining: *Create Breath Awareness*

- What are their triggers for dysfunctional breathing
- How are they breathing when this happens (nose vs. mouth, chest vs. belly, panting vs. controlled pace)
- Breath holding is common
  - Encourage exhalation when breathing starts to spiral or trigger is present
Dysautonomia and Orthostatic Intolerances

Dysautonomia
Range of clinical conditions characterized by dysfunction in the autonomic nervous system (Rocha et al, 2021)

Post COVID patients may experience (Raj et al, 2021):
• Orthostatic Intolerance
• Postural Orthostatic Tachycardia Syndrome (POTS)
Dysautonomia and Orthostatic Intolerances

Orthostatic Intolerance (Brignole, 2007)
• Movement into an upright position results in symptomatic arterial hypotension
• ANS fails to respond to the challenges imposed by upright positioning

Postural Orthostatic Tachycardia Syndrome (POTS) (Rocha et al, 2021)
• Sustained increase in HR ≥30 bpm or ≥120bpm, in the first 10 minutes of being in an upright position, without classical orthostatic hypotension
• Other symptoms include dizziness, weakness, presyncope and heart palpitations
# Dysautonomia and Orthostatic Intolerances

## Screen:

<table>
<thead>
<tr>
<th>Dysautonomia</th>
<th>“Since your symptoms of COVID-19”…</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Consider recent medical clearance, baseline status and/or pre-existing conditions when determining if patient requires further medical investigation.</em></td>
<td>1)…<em>do you feel lightheaded after you change position?</em> □ Yes □ No</td>
</tr>
<tr>
<td></td>
<td>2)…<em>do you feel unwell when sitting upright or standing?</em> □ Yes □ No</td>
</tr>
<tr>
<td></td>
<td>If “Yes” to either question, complete the <strong>Active Stand Test</strong> to screen for orthostatic hypotension (OH) or postural orthostatic tachycardia syndrome (POTS).</td>
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<tr>
<td></td>
<td>During the Active Stand Test, blood pressure (BP) and heart rate (HR) should be measured after 5 minutes in supine, the immediately upon standing and at 2, 5 and 10 minutes.</td>
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<tr>
<td></td>
<td>- <strong>Orthostatic hypotension (OH)</strong> = A fall in systolic blood pressure (SBP) of &gt;20mm Hg or diastolic blood pressure (DBP) &gt; 10 mm Hg from baseline.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Postural orthostatic tachycardia syndrome (POTS)</strong> = Sustained elevation of HR ≥ 30 bpm from baseline or ≥ 120 bpm, in the first 10 minutes of being in an upright position.</td>
</tr>
</tbody>
</table>

If patient screens **positive for OH**, provide education and proceed with symptom titrated activity and exercise.

If patient screens **positive for POTS**, refer back to primary care physician for further investigation.
Dysautonomia and Orthostatic Intolerances

Intervention

Self-management education (ie. position change caution, fluid intake, sodium intake, wearing support stocking or compressive clothing)

Breathing re-education and activity pacing (Putrino et al., 2021)

Physical activity and exercise should be adjusted based on symptoms, which may fluctuate from day-to-day. This may be referred to as symptom titrated physical activity (National Institute of Health Research, 2021)
Dysautonomia and Orthostatic Intolerances

Intervention

If medically cleared by a physician, structured exercise including aerobic reconditioning and strength training may be considered for patients with POTS (Fu and Levine, 2018)

During the initial stages of rehabilitation, non-upright exercises (i.e. recumbent cycling, swimming, seated resistance training, etc.) may be more suitable for patients who have significant symptoms in standing (Dani et al., 2020)

Autonomic Conditioning Therapy (ACT) may help to reduce fatigue and improve symptoms of autonomic dysfunction in post-COVID patients (Putrino et al., 2021)
Dysautonomia and Orthostatic Intolerances

Intervention

Can present in conjunction with post exertional symptom exacerbation

Consider a holistic treatment approach addressing topics such as: physical activity, mental well-being, pacing, sleep, nutrition, stress management, breathing and medication.
Post-COVID Outpatient Case Study:

• 62-year-old male hospitalized April 2020 with respiratory failure

• 31 days in ICU

• 83 days in hospital total, discharged with home oxygen at 5.0 litres/minute on exertion. Evidence of pulmonary fibrosis on imaging

• Referred to Pulmonary Rehabilitation August 2020, completed PR December 2020
Post-COVID Outpatient Case Study:

Pulmonary Rehabilitation

Brain Fog

Return to Work/ WCB

New Knowledge

Chronic Pain Management

Voice Program

Persistent Myalgias

New Diabetic

• 3 ED admissions
• >4 specialists
Acute Care Considerations

• Patients with COVID-19 are usually in ICU, COVID or Medicine units
• High volume of patients during surges
• Understand the 5 pillars of cautious management and beware of “Red Flags”
• Screen all patients with COVID19 for Rehab needs and education
• Collaborate timely with Interprofessional (IP) team re: medical investigation, stabilization and mitigation plan, discharge planning and referrals
Acute Care Considerations

• **Focus:**
  - Optimize function and mobility at least to baseline
  - Collaborate with IP team – daily activities planning and “energy optimization & budgeting”

• **Education**
  - Introduction to AHS resources/handouts, rest as an activity, self-management, Rehab Advice Line, return to work/school, answer patient’s questions
  - Staff education on roles of Rehab when treating patients with COVID

• **Promote safe transition of care**
• **Referring patient to appropriate community resources as indicated**
Acute Care Considerations

• Screening patients with COVID-19
  • Hemodynamic & autonomic functions
  • Cardiac function & symptoms
  • Exertional desaturation & pulmonary status
  • Mobility
  • Functional Cognition
• D/C planning and support system post discharge
• Other issues:
  • unpredictable progress
  • psychosocial
  • swallowing/voice issues, etc.
Acute Care Considerations

• Assessment & Intervention
  • When, Who, What, Why, How?
  • Every patient is different – patient centered care
    • The “Right Time” of assessment / intervention may vary
    • Be cautious of patient’s energy level and potential rapid changes in condition
    • Close monitoring – vitals, SpO2, perceived exertion & dyspnea
    • Slower progress, shorter session, incorporate activities with daily care
  • Timely team communication & collaboration
    • Daily IP team round
    • Plan patient’s daily activities to optimize energy → Avoid “Energy Overdraft/bankruptcy”
    • Assist team members when able – beyond “normal” practices
  • Be creative and flexible
Acute Care Considerations

• Primary Therapist Model
  • Minimize # of vectors
  • Division of labor → improve efficiency
  • Understand other Team members’ roles & responsibilities
  • Refer to specific discipline as needed

• Collaboration with RT & Nursing
  • PESE, exertional desaturation, sleep hygiene, functional cognition issues, impact of isolation
  • Home O₂ assessment prior to discharge – *Collaborate with RT on unit, resting ABG vs. alternative criteria (e.g. exertional oxymetry test)
Acute Care Considerations

• Follow IPC policy & procedure perfectly!

• Mobility & Cardiopulmonary
  • Activities may be different than those for usual medicine patients
  • Graded exercise is not for everyone
  • Do activities in small steps, intervals and progression and at the “Right Time”
  • Optimize to baseline functional level
  • Rest as an activity, work with team to promote energy optimization & sleep hygiene
  • Close monitoring – always have a Plan B, C, D and E!
  • Breath control, huff vs. cough, voice issues may be due to persistent cough/trauma to the vocal folds due to intubation +/- prone positioning (consider SLP consultation)
  • Expedite referral to medical team for specialty consultation if needed
  • “Learning & Teaching” moments for patients AND peers – we are still learning everyday!
Acute Care Considerations

• Functional Cognition:
  • General screen, Brain fog, knowledge acquisition, memory issues
  • Exercise the brain, mitigation strategies

• Psychosocial:
  • Stress, anxiety due to isolation & disease
  • Family or social support
  • Worries about returning to work, school, hobbies/recreation
  • Rec Therapy activities package for patients in isolation (magazines, books, crossword puzzles, radio, clock, etc.)
  • Promote family/social connection with iPad, phone video chat, etc.
Acute Care Considerations

• Education – Patient & Family
  • AHS resources & handouts, PESE, self-management (e.g. 3 or 6 Ps), Rehab Advice Line, rest-activity-priority, pacing activities with caution
  • Home activity program, self-proning, breathing exercises/positions, huff vs cough, etc.
  • Educate other Healthcare professionals with same information
Acute Care Considerations

• Discharge Planning
  • Aware of available resources
  • Flagging Rehab needs/barriers (e.g. daily unit round or weekly rounds), understand PCFS and other screening tools
  • Collaboration on post acute community rehab programs, locations, means (e.g. repatriate back to home hospital, public vs. private programs, home care, in-person vs. virtual rehab, WCB, online resources, etc.)
  • Collaborate with SW and Transition Coordinator
  • Minimize risk of any patient falling through the crack of the system
  • Discharge handouts linked to AHS resources, Rehab Advice Line
  • Be available for colleagues from post acute care Rehab settings
Acute Care Case Scenario

50 yr female adm to ICU due to COVID19 and pneumonia for 10 days and transferred to COVID unit on 10LpmO2 on D11.

D14, patient was on 2Lpm O2 and 3-4Lpm O2 for mobility/transfer due to persistent cough and SOB even on light exertion

D15-20, 0.5LpmO2 to maintain SpO2 at 92%

D20 Patient was able to do 10 steps of stairs and ambulated for 20m on Room Air

ABG was normal prior to discharge
Acute Care Case Scenario

Patient was given D/C handout, AHS post COVID Rehab resources, Rehab Advice Line, phone number of the unit to contact Rehab if needed, patient was eager to get back to work ASAP

Patient was D/C on **weekend**, pt called the unit the next day as she had SOB++ and her own oximeter showing SpO₂ <90%

Patient was given the number of a Home Oxygen company, patient had to pay for her own O₂
Acute Care Case Scenario

What have we learned?

The importance of collaboration with RT & Team and understand the alternative criteria for home O₂.
Practice Considerations Resource

Rehabilitation & Allied Health Practice Considerations
Post COVID-19

Table of Contents

- Standing and Seating Management
- Personal Protective Equipment
- Physical Examination
- Fever Screening
- Supplemental Oxygen: Breathing, exercise, and oxygen concentrator use
- Hand Hygiene
- Appropriate Use of Face Masks

Version 1
June 2021
For more information:

• Post COVID Provider Resource Webpage (AHS external)
  • COVID-19 Recovery & Rehabilitation After COVID-19: Resources for Health Professionals | Alberta Health Services

• Allied Health Practice and Education Hub
  • Post-COVID Clinician Resources - All Documents (ahsnet.ca)

• Practice.consultation@ahs.ca
Rehabilitation Advice Line

Rehabilitation advice can help you recover from injury, orthopedic surgery, COVID-19 or manage a neurological condition.

A healthcare professional on the line can provide you with:
• Activities and exercises to help with physical concerns
• Strategies to manage day-to-day activities affected by these concerns
• Rehabilitation services open for in-person or virtual visits
• Community organizations available for support

1-833-379-0563 – 9 a.m. to 5 p.m. Mon-Fri
Additional Webinars:

• **June 10** – Physical Sequelae and Screening
• **June 15** – Maximizing Energy and Returning to Daily Activities and Meaningful Occupations
• **June 22** – Resuming Activity & Exercise
• **June 29** – Psychological, Spiritual and Social Considerations Important in Post-COVID Care
• **July 6** – Neurocognitive Sequelae, Functional Cognition and Cognitive Communication
• **July 13** – Nutrition, Eating, Feeding and Swallowing
• **July 20** – Re-engagement in the Community
Questions?


