

# Case Specific Rehabilitation Post-COVID: *Cardiovascular and Pulmonary Considerations and Guidelines*

Dr. Kala M. Markel, PT, DPT



# Goals

- Brief review of COVID & Post COVID Syndrome
  - Evaluation Components
  - Treatment Guidelines
  - Discharge Planning
- 



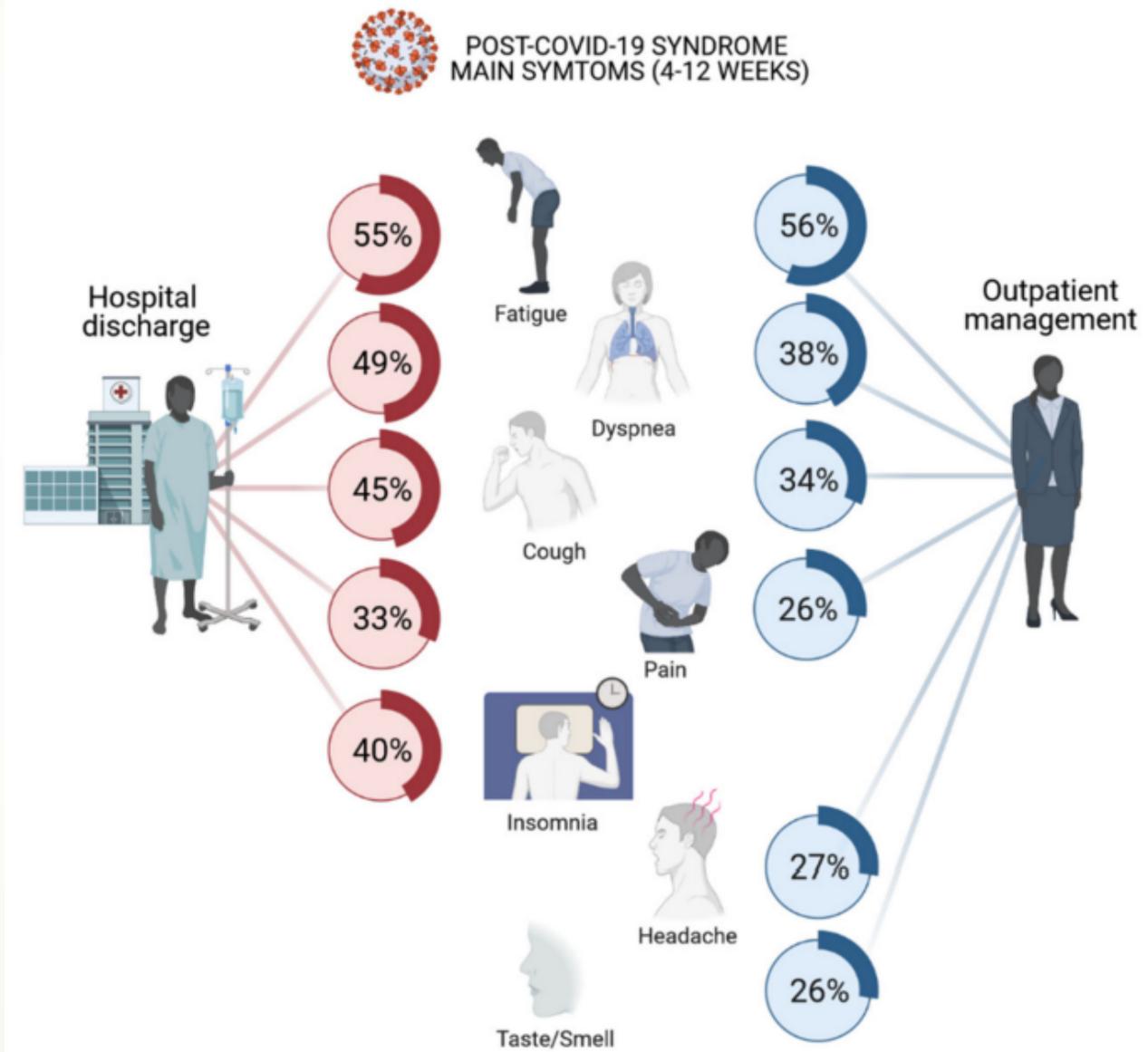
# COVID and Post-COVID Syndrome



# COVID-19: Not Just the Virus

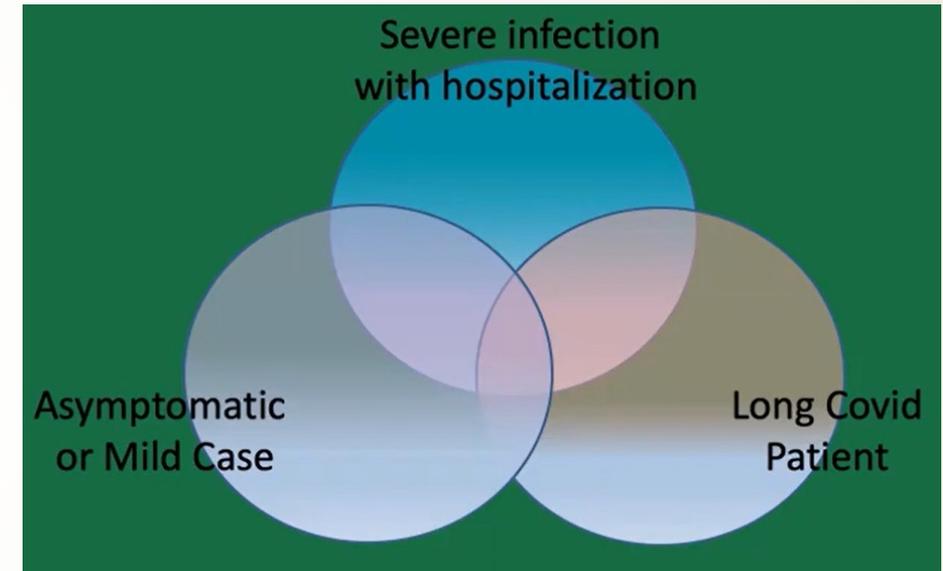
- ▶ The COVID pandemic illuminated how a highly infectious virus can overburden healthcare systems
- ▶ Greater effects on those with poor baseline health
  - ▶ More likely to develop post-viral complications
    - ▶ Asthma, hypertension, obesity, diabetes, chronic kidney disease, etc.
    - ▶ The more conditions you have, the greater the risk of hospitalization and long-term complications
- ▶ Greater effects on those with ICU stay and/or mechanical ventilation

# Post COVID-19 Syndrome



# Asking about COVID-19

- ▶ We must get into the habit of asking **ALL** patients if they have a history of COVID-19 infection
- ▶ Thorough history includes onset of virus, length of illness, type of care required and screening for any post-viral symptoms



**Screen all clients for a past medical history of a COVID-19 infection (confirmed or suspected) before assessment and management in a rehabilitation or exercise setting.**



# Evaluation Recommendations

- ▶ Formal assessment of physical and emotional functioning at 6-8 weeks post hospital discharge
- ▶ Follow up should include measures of exercise capacity, respiratory function, cardiac function, cognitive/psychosocial function, and symptom reporting
- ▶ COVID-19 survivors with a need for rehab interventions should receive a comprehensive program to address wide range of issues



# Thinking Through the Evaluation



# Common Symptoms of Post-COVID Syndrome

- Fatigue
- Shortness of Breath
- Joint Pain
- Muscle Weakness
- Postexercise malaise
- Tachycardia
- Recurrence of Prior Injuries
- Brain Fog
- The list goes on and on...



# Screening During Evaluation



## ➤ Post Exertional Symptom Exacerbation

- Worsening of sx 24-72 hours post exertion

## ➤ Cardiac Impairment

- Myocarditis, pericarditis, tachycardia, etc.

## ➤ Oxygen Desaturation

- Pulmonary system dysfunction

## ➤ Dysautonomia

- Inability to regulate HR, BP, temperature, etc.

## ➤ Functional Cognition & Cognitive Communication

- “brain fog”

## ➤ Voice & Swallowing

- Hoarse voice, difficulty swallowing

## ➤ Hearing & Tinnitus

- May have changes in one or both ears

## ➤ Psychological, Social & Spiritual Considerations

- Stressful event → anxiety, depression are common



Don't Overthink it...

# Rehab is still rehab

You can do this, just don't practice out of your  
"COMPETENCE ZONE"

... which may be different than your comfort zone!





# How Do We Evaluate?

## ➤ Review of PMH and HPI

- Relevant history, diagnostic tests, medications, etc.
- Current functional limitations, goals for rehab

## ➤ Vitals, Vitals, Vitals

- BP, HR, SpO<sub>2</sub>
  - Baseline/Pre-testing, During testing, Post-testing

## ➤ Physical Exam

- UQL/LQS, AROM, myotomes, sensation, MMT, ortho special testing (if needed), etc.



# How Do We Evaluate?

## ► **Functional Assessments**

- Gait speed, TUG, 30 second chair rise test/5x STS, 30 second arm curl test, stairs, balance, etc.

## ► **Endurance**

- 2 or 6-minute walk test, 2-minute step test, 10-meter shuttle test, etc.

## ► **Patient Questionnaires**

- MOS, SF-36, SOBQ, mMrc, DAS1, HADS, CES-D, etc.



# Meet the Patients



# Patient 1: “Tom”

- 73-year-old Caucasian male, no significant prior PMH
- Diagnosed with COVID-19 in December 2021 and hospitalized x 4 weeks → 1 week of home health care
  - Referred to outpatient services (via PCP) at ~6 weeks after acute virus
- Endorses fatigue and shortness of breath with all activities
  - “I didn’t have any trouble doing anything prior to this.”
  - Utilizing 2-4L of continuous supplemental oxygen 24/7

# Tom's Evaluation

## ➤ VS pre-exercise:

- SpO<sub>2</sub> 98% on 2L CF oxygen
- HR 95 bpm, regular
- BP 122/78 mm Hg

## ➤ Posture: mild forward head/rounded shoulders

## ➤ UE AROM & LE AROM: WNL

## ➤ UE MMT:

- Shoulder Flex 4+/5 B
- Shoulder ABD 4/5 B
- Elbow Ext 4/5 B
- Elbow Flex 4+/5
- Wrist Ext 4/5 B
- Wrist Flex 4/5 B

## ➤ LE MMT:

- Hip Flex 4/5 B
- Hip ADD 4+/5 B
- Hip ABD 4+/5 B
- Knee Ext 5/5 B
- Knee Flex 4+/5
- DF 4+/5
- PF 4/5 B

## ➤ Balance:

- Romberg EO = able to maintain for 30 seconds without LOB
- Romberg EC = able to maintain for 22 seconds before LOB
- Tandem = able to maintain for 11 seconds before LOB

## ➤ TUG: 9 seconds

## ➤ 30 sec Chair Rise Test: 11 repetitions with UEs, SpO<sub>2</sub> 98% on 4L CF oxygen, HR 95 bpm, RPE = 2

## ➤ 30 sec Arm Curl Test: 5# with R UE -- 21 repetitions, SpO<sub>2</sub> 99% on 4L CF oxygen, HR 89 bpm, RPE = 1

## ➤ Gait Speed: 1.01 m/s

## ➤ Stair climbing: 11 steps x 1 with RPE=2, HR 99, SpO<sub>2</sub> 97% on 4L CF oxygen

## ➤ 6MWT: Pt ambulated 638 feet, converting to a MET level of 1.91. He required up to 5L CF oxygen to complete testing with lowest SpO<sub>2</sub> reading at 85%.

## ➤ Questionnaires: SOBQ = 69, mMrc = 2, HADS = A=5, D=4



## Patient 2: “Cliff”

- ▶ 62-year-old African American male with significant PMH for sarcoidosis of the lung, blood clotting disorder, DMII, HTN, HLD
- ▶ Diagnosed with COVID-19 in October 2021 → ICU with “significant oxygenation needs” for approximately 9 days → DC’ed Home
  - ▶ Dry cough persisted so PCP sent for testing late November 2021
    - ▶ Pt had significant blockage in heart (diagnosed with STEMI) and underwent cardiac cath procedure
    - ▶ Pt referred to outpatient services (via cardiologist) at ~8 weeks post dc from hospital for COVID-19
- ▶ Endorses fatigue, shortness of breath, inability to work

# Cliff's Evaluation

## ➤ VS pre-exercise:

- SpO<sub>2</sub> 98% RA
- HR: 99 bpm, irregular
- BP 142/82 mm Hg

➤ **Posture:** WFL, slight rounded shoulders

➤ **UE & LE AROM:** WNL

## ➤ UE MMT:

- 5/5 in all major mm groups (shoulder flex/abd, elbow flex/ext, wrist flex/ext)

## ➤ LE MMT:

- 5/5 in all major mm groups (hip flex/abd/add, knee flex/ext, df/pf)

➤ **30 sec Arm Curl Test:** TO BE ASSESSED

➤ **30 sec Chair Rise Test:** TO BE ASSESSED

➤ **Gait Speed:** 1.10 m/s

➤ **Stair climbing:** TO BE ASSESSED

➤ **Submax TM Test:** Pt ambulated for 3 minutes before SOB became a 5/10 and HR increased from 99 bpm to 134 bpm. MET level 2.30 with total distance 0.08 miles completed.

➤ **Questionnaires:** DAS1 = 6.36, CES-D= 1

➤ Further objective assessment was deferred due to high HR response and pt with baseline fatigue. (Per COVID recommendations, pushing through fatigue is not warranted and can further exacerbate symptoms.)



# Cliff's "Second" Evaluation

- At first treatment session, we assessed the remaining objective measures to complete his evaluation from the visit prior
- **30 sec Arm Curl Test:** 20 reps (R UE 8#), with RPE=1, SpO<sub>2</sub> 100%, HR 95 bpm
- **30 sec Chair Rise Test:** 15 reps with UEs, SpO<sub>2</sub> 100%, HR 113, RPE=4
- **Gait Speed:** 1.10 m/s
- **Stair climbing:** 11 steps x 1, RPE=2, HR 101, SpO<sub>2</sub> 95% RA



## Patient 3: “Helen”

- ▶ 71-year-old female, with PMH significant for A-fib, OSA, CAD, HTN, SOB, chronic back pain, osteoarthritis, B TKA 2014, R THR 2015
- ▶ Diagnosed with COVID-19 in March 2022 with no need for hospitalization; symptoms lasted around 10 days
  - ▶ Following acute virus, she reports an onset of L knee pain that has been worsening
  - ▶ Referred via orthopedic surgeon ~8 weeks post infection
- ▶ Endorses knee pain, muscle weakness

# Helen's Evaluation

## ▶ **VS pre-exercise:**

- ▶ SpO<sub>2</sub> 98% RA
- ▶ HR: 85 bpm, irregular
- ▶ BP 148/80 mm Hg

- ▶ **Posture:** rounded shoulders, forward head posture

## ▶ **UE & LE AROM:** WFL, except L knee

- ▶ -5 – 100 degrees w pain

## ▶ **LE MMT (L,R):**

- ▶ Hip Flex = 4/5, 4+/5
- ▶ Hip ABD = 4/5, 4+/5
- ▶ Hip ADD = 4/5, 4+/5
- ▶ Knee Ext = 4+/5, 5/5
- ▶ Knee Flex = 4/5, 4+/5
- ▶ DF = 4/5, 4+/5
- ▶ PF = 4/5, 4+/5

## ▶ **Mobility:**

hypomobile/painful patellar glides, tibial extension

- ▶ **5x STS:** 23 seconds

- ▶ **TUG:** 22 seconds

- ▶ **Gait Speed:** 0.56 m/s

- ▶ **Stair climbing:** not assessed

- ▶ **2MWT:** Pt walked a total of 110 feet, converting to a MET level of 1.47. She did not require supplemental oxygen during testing and lowest SpO<sub>2</sub> 97% on room air.

- ▶ **Questionnaires:** FOTO = 50, KOOS JR = 62



# Patient Presentation Summary



- ▶ Tom, 73 years old, no PMH, now on 5L supplemental oxygen
- ▶ Cliff, 62 years old, cardiopulmonary PMH, now with significant fatigue, increased blood pressure, tachycardia
- ▶ Helen, 71 years old, A-Fib and orthopedic PMH, now with return of L knee pain and weakness

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# Determining Treatment Guidelines



# How Do We Treat?

- ▶ What's the “right” prescription?
  - ▶ How do I determine frequency, intensity, time, type? (FITT)
  - ▶ What do I monitor, and when?
  - ▶ How do I decide on goals?



# Determining FITT

- ▶ The history of Chronic Fatigue Syndrome with exercise is one of false hope
  - ▶ “Exercise can be harmful, sometimes life threatening, and should be avoided.”
    - ▶ Post-exertional malaise (PEM) manifests as an abnormal physiological response to physical or cognitive exertion
      - ▶ Anecdotes of PEM are emerging from people living with long COVID
- ▶ So... now what?



# First... We Must Do No Harm

- ▶ “Exercise is medicine” is ingrained in us as much as “do no harm”
  - ▶ So, what do we do when one oath contraindicates another?
    - ▶ Promoting “bad” exercise prescriptions may promote an endless cycle of overexertion and recurrence of symptoms
- ▶ **Screen and continuously monitor**
  - ▶ Look for signs of PEM during and after your sessions
    - ▶ 10-item DePaul Symptoms Questionnaire
- ▶ **Promote the message “Stop. Rest. Pace.”**
  - ▶ Our main advice should be to avoid continuous overexertion cycles and focus on energy conservation techniques



# FITT Considerations: Endurance

- ▶ **Frequency:** ideal is 4-6 days/week; options: longer duration every other day OR shorter duration daily
- ▶ **Intensity:** is low-intensity ex first 6-8 weeks out of hospital with  $\leq 3$  dyspnea on modified 0-10 Borg scale; a second source recommends 3-4 or less
  - ▶ Do not over-exert and exhaust the patient
- ▶ **Time:** start with short duration intervals (ex: ambulate 2 min, rest 1 min, repeat 4-6 times) and add 1 minute to each ambulation interval every 3 to 5 days
- ▶ **Type:** May do better with seated aerobic training such as NuStep or recumbent bike



# FITT Considerations: Endurance cont.

- ▶ Continuous monitoring is best (not spot checks)
  - ▶ Document # of rest breaks and length; show decrease over time as objective qualifiers
- 



# FITT Considerations: Strength

- **Frequency:** 2-4 days/week
  - **Intensity:** Low weight, high repetitions → start with 10 reps at moderate effort
    - Looking to build muscle endurance, not muscle hypertrophy
    - Progress strength to building muscle later in care
  - **Time:** no specific recommendation
  - **Type:** functional strength training (step ups, STS, pushing/pulling, squats, etc.)
- 



# Second... Monitor, Monitor, Monitor

- ▶ Consistent monitoring of vital signs with all activities may give indications into exercise tolerance

## ***Always monitor:***

- ▶ HR: must not increase more than 20 bpm from baseline HR during mild intensity exercise
- ▶ Systolic BP: must be  $\leq 180$  mmHg and  $\geq 90$  mmHg
- ▶ SpO<sub>2</sub>: Must remain above 93%
  - ▶ If a drop greater than 4% occurs with activity, stop the activity
- ▶ Symptomatology: with use of Borg for dyspnea (cannot exceed 4/10) and RPE for fatigue (must not exceed 2-4/10)

*Staying in/below these ranges allows for modulation of the inflammatory process*

## Third... Be Resourceful

- ▶ Exercise may be our first line of treatment, but it is not the only option





# So... if we can't exercise our patients, what can I do as a physical therapist?

## **Identify the patient is a long-hauler COVID patient**

- ▶ This is through our history taking/subjective story of the evaluation

## **Refer for appropriate screening**

- ▶ Potential for POTS, ME/CFS
  - ▶ Cardiac screening
  - ▶ Chest Xray, blood work

## **Assess vitals and monitor vital responses to activity**

- ▶ Educate accordingly

## **When SLOW progression goes well, support it! (But DO NOT PUSH IT)**

## **Education**

- ▶ pacing, energy conservation, body mechanics, etc.

## **Treat any symptom you can**

- ▶ Cognitive: brain apps, word games, memory games
- ▶ Anxiety: mental health strategies
- ▶ Visual/Vestibular: may not respond to normal vertigo tx, but you should try to see if you can get symptom alleviation, balance activities
- ▶ Respiratory dysfunction: breathing techniques, manual therapy if indicated

## **Provide Resources**

- ▶ Education materials, support group information
- ▶ If there is a long-hauler clinic in your area, refer them so they get the best care possible



## How to use pacing with your physiotherapist

World PT Day 2021

Pacing is a self-management strategy during activity to avoid post-exertional symptom exacerbation (PESE). When pacing you do less activity than you have energy for, keeping activities short, and resting often.

- Learn about your energy reserve/reservoir**
  - Your energy reserve is how much energy you have each day – this will vary so it is best to find your baseline by using an activity and symptom diary. Your "baseline" is what you can do fairly easily on a good day and only just do on a bad day.
  - You should always aim to leave some energy at the end of the exercise – don't keep going until you feel tired.
- Learn how much energy you have**
  - Your activity and symptom diary should start to show some patterns. You can now reduce or modify your activity levels so that you don't trigger PESE or "crash". This will help you find a level of activity you can maintain on both good and bad days, unless you have a relapse. Learn to recognise early signs of PESE and immediately initiate stop, rest, pace to avoid a crash.
- Learn how to use the 4 Ps to help you plan your activities**
  - Prioritise** what you really need to do in a day or week. Question whether all activities are necessary. Can someone else do it? Can I change the activity so it is easier for me?
  - Plan** in your main prioritised tasks for the day. Plan in your rest time so the day is paced.
  - Pacing** – break up your activity into smaller, more manageable tasks with rest breaks.
  - Pleasure** – spend some energy on things you enjoy to help improve your quality of life.
- Learn how to save energy**
  - Learn to say no.
  - Avoid the temptation to "do just a little more".
  - Modify your activities to use less energy.
  - Take short cuts and ask for help.
- Learn to rest between activities**
  - Rest means absolutely minimal activity and little or no mental stimulation.
  - During rests avoid activities that can be stimulating, such as TV and social media.
  - Try some meditation and/or breathing exercises instead.

**Can I ever do more?**

- When your symptoms improve you will experience less weakness and fatigue. Work with your physiotherapist to find out how to increase your activity levels very gradually, such as carrying out some core strengthening exercise or increasing the amount you can walk by 10%.
- Be realistic and stay flexible – try to create a weekly routine, but accept that some days you will need more rest than others and avoid your triggers.
- Focus on your accomplishments instead of symptoms or what you have not achieved.

**Heart rate monitoring**

Your physiotherapist can teach you how to take your heart rate. Then, take your heart rate every morning before getting out of bed. Keeping your heart rate within 15 beats per minute of your weekly average should reduce the risk of PESE.

Activity management or pacing is likely to be a safe and effective intervention for managing fatigue and post-exertional symptom exacerbation (PESE). Heart rate monitoring is likely to be a safe and effective intervention for managing fatigue and PESE.  
**Graded exercise therapy should not be used, particularly when post-exertional symptom exacerbation is present.**

World Physiotherapy  
[www.world.physio/wptday](http://www.world.physio/wptday)

It's ok to tell patients, "you aren't ready for me yet" and provide education/resources and have them return when symptoms subside for "traditional" PT services



Back to the Patients...



# Tom's Treatment

## ▶ Endurance

- ▶ F = 3 days/week
- ▶ I = 1.2 mph, resistance 1.0, resistance 1
- ▶ T = 6 minutes
- ▶ T = Treadmill, UBE, Bicycle

## ▶ Strength

- ▶ F = 3 days/week
- ▶ I = 2 sets of 10 repetitions
- ▶ T = ~20 minutes
- ▶ T = step ups, STS, bicep curls, TB posture exercises, breathing techniques

## ▶ Monitoring

- ▶ HR, BP, SpO<sub>2</sub>
- ▶ At arrival, with all aerobic activities, intermittently with strength, at exit

## ▶ Education

- ▶ Pacing, energy conservation, supplemental oxygen usage, vital signs guidelines



# Cliff's Treatment

## ▶ Endurance

- ▶ F = 3 days/week
- ▶ I = 1.0 mph, resistance 2.0, resistance 1
- ▶ T = 6 minutes
- ▶ T = Treadmill, UBE, Bicycle

## ▶ Strength

- ▶ F = 3 days/week
- ▶ I = 2 sets of 10 repetitions
- ▶ T = ~30 minutes
- ▶ T = step ups, STS, bicep curls, TB posture exercises, breathing techniques

## ▶ Monitoring

- ▶ HR, BP, SpO<sub>2</sub>
- ▶ At arrival, with all aerobic activities, intermittently with strength, at exit

## ▶ Education

- ▶ Pacing, energy conservation, vital signs guidelines, body mechanics



# Helen's Treatment

## ▶ Endurance

- ▶ F = 2 days/week
- ▶ I = Resistance 1.0
- ▶ T = 6 minutes
- ▶ T = Nu-Step

## ▶ Strength

- ▶ F = 2 days/week
- ▶ I = 1-2 sets of 10-15 repetitions
- ▶ T = ~40 minutes
- ▶ T = focus on glut med, quad, hamstring, functional activities

## ▶ Monitoring

- ▶ HR, BP, SpO<sub>2</sub>
- ▶ At arrival, after aerobic activities, intermittently with strength, at exit

## ▶ Education

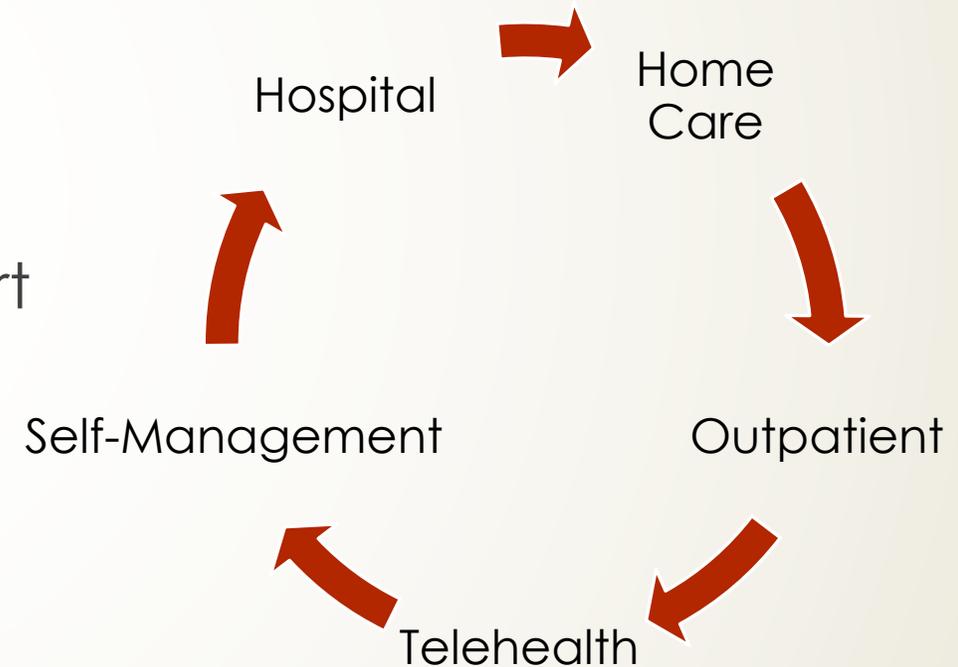
- ▶ Pacing, body mechanics, vitals signs guidelines

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# Discharge Planning

# When Do We Know We're Done?

- ▶ During illness and recovery, patients will transition to different sites of care for follow-up as dictated by clinical need
- ▶ Achieve the goals and support self-management
- ▶ Reassess as needed
  - ▶ Consider 1-3-6 month follow up appointments





Where are the patients now?

# Tom's Discharge

## ➤ **VS pre-exercise:**

- SpO<sub>2</sub> 99% on 2L CF oxygen
- HR 70 bpm, regular
- BP 130/76 mm Hg

## ➤ **UE MMT:** + in all tested groups

## ➤ **LE MMT:** + in all tested groups

## ➤ **Balance:** in summary, improved

## ➤ **TUG:** 9 seconds → 7 seconds

## ➤ **30 sec CR:** 11 repetitions with UEs, SpO<sub>2</sub> 98% on 4L CF oxygen, HR 95 bpm, RPE = 2 → 16 repetitions with UEs, SpO<sub>2</sub> 97% on 2L CF, HR 104 bpm, RPE = 2

## ➤ **30 sec Arm Curl Test:** 5# with R UE -- 21 repetitions, SpO<sub>2</sub> 99% on 4L CF oxygen, HR 89 bpm,

RPE = 1 → 8# with R UE -- 20 repetitions, SpO<sub>2</sub> 95% on 2L CF oxygen, HR 101 bpm, RPE=1

## ➤ **Gait Speed:** 1.01 m/s → 1.21 m/s

## ➤ **Stair climbing:** 11 steps x 1 with RPE=2, HR 99, SpO<sub>2</sub> 97% on 4L CF oxygen → 11 steps x 3 with RPE=2, HR 110 bpm, SpO<sub>2</sub> 95% on 2L CF oxygen

## ➤ **6MWT:**

- Pt ambulated 638 feet, converting to a MET level of 1.91. He required up to 5L CF oxygen to complete testing with lowest SpO<sub>2</sub> reading at 85%.

- Discharge = Pt walked for a total of 1245 feet, converting to a MET level of 2.78. He required 2L of supplemental oxygen for testing with lowest SpO<sub>2</sub> reading at 93%.

# Cliff's Discharge

- ▶ **VS pre-exercise:**
  - ▶ SpO2 100% RA
  - ▶ HR: 73 bpm, irregular
  - ▶ BP 148/84 mm Hg
- ▶ **UE MMT & LE MMT:** maintained at 5/5
- ▶ **30 sec Arm Curl Test:** 20 reps (R UE 8#), with RPE=1, SpO2 100%, HR 95 bpm → 28 reps (R UE 8#) with RPE=0.5, SpO2 97%, HR 74 bpm
- ▶ **30 sec Chair Rise Test:** 15 reps with UEs, SpO2 100%, HR 113, RPE=4 → 19 reps without UEs, SpO2 99%, HR 91, RPE=2
- ▶ **Gait Speed:** 1.10 m/s → 1.34 m/s
- ▶ **Stair climbing:** 11 steps x 1, RPE=2, HR 101, SpO2 95% RA → 11 steps x 3, RPE=2, HR 97 bpm, SpO2 97% RA
- ▶ **Submax TM Test:**
  - ▶ Initial = Pt ambulated for 3 minutes before SOB became a 5/10 and HR increased from 99 bpm to 134 bpm. MET level 2.30 with total distance 0.08 miles completed.
  - ▶ Discharge = Pt ambulated for 9 minutes covering 0.27 miles and converting to a MET level of 5.10. His ending HR was 112 bpm with a BP of 156/82 mmHg. SOB 4/10 and leg fatigue 4/10. No supplemental oxygen required with testing.

# Helen's Discharge

## ➤ VS pre-exercise:

- SpO<sub>2</sub> 99% RA
- HR: 83 bpm, irregular
- BP 142/80 mm Hg

## ➤ UE & LE AROM: WFL, except L knee

- -5 – 100 degrees w pain → 0 – 115, no pain

## ➤ LE MMT (L,R): + in all mm groups tested

## ➤ Mobility: hypomobile/painful patellar glides, tibial extension → normal mobility, no pain

## ➤ 5x STS: 23 seconds → 17 seconds

## ➤ TUG: 22 seconds → 15 seconds

## ➤ Gait Speed: 0.56 m/s → 0.71 m/s

## ➤ Stair climbing: not assessed; 11 steps x 1 with RPE=1, SpO<sub>2</sub> 97%, HR 94 bpm, irregular

## ➤ 2MWT:

- Initial = Pt walked a total of 110 feet, converting to a MET level of 1.47. She did not require supplemental oxygen during testing and lowest SpO<sub>2</sub> 97% on room air.
- Discharge = Pt walked a total of 180 feet, converting to a MET level of 1.77. She did not require supplemental oxygen during testing and lowest SpO<sub>2</sub> 96% on room air.

## ➤ Questionnaires: FOTO = 64, KOOS JR = 78



# The Take Home Message



# It All Comes Down to This...

- ▶ **Rehab is Rehab**

- ▶ Treat in your COMPETENCE ZONE

- ▶ **Monitor those Vitals**

- ▶ HR, BP, SpO<sub>2</sub>

- ▶ **Provide Meaningful, Appropriate Treatment**

- ▶ Slow Stop Rest
- ▶ Patient Education

- ▶ **Be a Lifeline to Your Patients**

- ▶ Provide HEP, follow-up appointments (1-3-6 months), give research resources



Thank You!



# Resources

- ▶ Academy of Cardiovascular and Pulmonary Physical Therapy. CVP PACER Bundle. Course. <https://learningcenter.apta.org/>
- ▶ Calabrese, M, Garofano, M, Palumbo, R, et al. *Exercise Training and Cardiac Rehabilitation in COVID19 Patients with Cardiovascular Complications: State of Art.* Life 2021, 11, 259. <https://doi.org/10.3390/life11030259>
- ▶ Décary S, Gaboury I, Poirier S, et al. *Humility and Acceptance: Working Within Our Limits With Long COVID and Myalgic Encephalomyelitis/Chronic Fatigue Syndrome.* Journal of Orthopaedic & Sports Physical Therapy, Published Online: April 30, 2021 Volume51 Issue 5 Pages197-200
- ▶ Francis A, Harris J, Coleman J. *Rehabilitation for Clients with Post COVID-19 Condition (Long COVID): Guidance for Canadian Rehabilitation and Exercise Professionals.* Version 1. August 2021.
- ▶ Gentil P, de Lira CAB, Souza D, et al. *Resistance Training Safety during and after the SARS-Cov-2 Outbreak: Practical Recommendations.* Biomed Res Int. 2020 Sep 23;2020:3292916.
- ▶ Spruit MA, Holland AE, Singh SJ, et al. *COVID-19: Interim Guidance on Rehabilitation in the Hospital and Post-Hospital Phase from a European Respiratory Society and American Thoracic Society-coordinated International Task Force.* European Respiratory Journal Jan 2020, 2002197.



# Patient Questionnaire Resources

- ▶ [https://www.rand.org/health-care/surveys\\_tools/mos/social-support.html](https://www.rand.org/health-care/surveys_tools/mos/social-support.html) – MOS Social Support Survey
- ▶ [https://www.rand.org/health-care/surveys\\_tools/mos/36-item-short-form.html](https://www.rand.org/health-care/surveys_tools/mos/36-item-short-form.html) – Short Form 36
- ▶ [https://www.thoracic.org/members/assemblies/assemblies/srn/questionnaires/so\\_bq.php](https://www.thoracic.org/members/assemblies/assemblies/srn/questionnaires/so_bq.php) – San Diego Shortness of Breath Questionnaire
- ▶ <https://www.mdcalc.com/calc/4006/mmrc-modified-medical-research-council-dyspnea-scale> – Modified Medical Research Council Dyspnea Scale - mMrc
- ▶ <https://www.mdcalc.com/calc/3910/duke-activity-status-index-dasi> – Duke Activity Status Index
- ▶ <https://academic.oup.com/occmed/article/64/5/393/1436876> - Hospital Anxiety and Depression Scale
- ▶ <https://arc.psych.wisc.edu/self-report/center-for-epidemiologic-studies-depression-scale-cesd/> – Center for Epidemiologic Studies Depression Scale
- ▶ <https://csh.depaul.edu/about/centers-and-institutes/ccr/myalgic-encephalomyelitis-cfs/Pages/measures.aspx> – DePaul Symptoms Questionnaire

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# Patient Handouts



# How to use pacing with your physiotherapist



Pacing is a self-management strategy during activity to avoid post-exertional symptom exacerbation (PESE). When pacing you do less activity than you have energy for, keeping activities short, and resting often.

- Learn about your energy reserve/reservoir**
  - Your energy reserve is how much energy you have each day – this will vary so it is best to find your baseline by using an activity and symptom diary. Your “baseline” is what you can do fairly easily on a good day and only just do on a bad day.
  - You should always aim to leave some energy at the end of the exercise – don’t keep going until you feel tired.
- Learn how much energy you have**
  - Your activity and symptom diary should start to show some patterns. You can now reduce or modify your activity levels so that you don’t trigger PESE or “crash”. This will help you find a level of activity you can maintain on both good and bad days, unless you have a relapse. Learn to recognise early signs of PESE and immediately initiate stop, rest, pace to avoid a crash.
- Learn how to use the 4 Ps to help you plan your activities**
  - Prioritise** what you really need to do in a day or week. Question whether all activities are necessary. Can someone else do it? Can I change the activity so it is easier for me?
  - Plan** in your main prioritised tasks for the day. Plan in your rest time so the day is paced.
  - Pacing** – break up your activity into smaller, more manageable tasks with rest breaks.
  - Pleasure** – spend some energy on things you enjoy to help improve your quality of life.
- Learn how to save energy**
  - Learn to say no.
  - Avoid the temptation to “do just a little more”.
  - Modify your activities to use less energy.
  - Take short cuts and ask for help.
- Learn to rest between activities**
  - Rest means absolutely minimal activity and little or no mental stimulation.
  - During rests avoid activities that can be stimulating, such as TV and social media.
  - Try some meditation and/or breathing exercises instead.

**Can I ever do more?**

- When your symptoms improve you will experience less weakness and fatigue. Work with your physiotherapist to find out how to increase your activity levels very gradually, such as carrying out some core strengthening exercise or increasing the amount you can walk by 10%.
- Be realistic and stay flexible – try to create a weekly routine, but accept that some days you will need more rest than others and avoid your triggers.
- Focus on your accomplishments instead of symptoms or what you have not achieved.

**Heart rate monitoring**

Your physiotherapist can teach you how to take your heart rate. Then, take your heart rate every morning before getting out of bed. Keeping your heart rate within 15 beats per minute of your weekly average should reduce the risk of PESE.

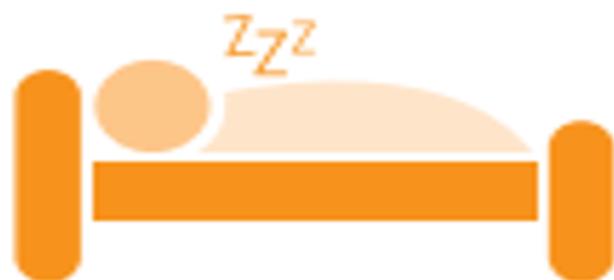
Activity management or pacing is likely to be a safe and effective intervention for managing fatigue and post-exertional symptom exacerbation (PESE). Heart rate monitoring is likely to be a safe and effective intervention for managing fatigue and PESE.

**Graded exercise therapy should not be used, particularly when post-exertional symptom exacerbation is present.**





**STOP** trying to push your limits. Overexertion may be detrimental to your recovery.



**REST** is your most important management strategy. Do not wait until you feel symptoms to rest.



**PACE** your daily physical and cognitive activities. This is a safe approach to navigate triggers of symptoms.

**FIGURE.** The "Stop. Rest. Pace" approach to safely manage physical and cognitive activities while recovering from long COVID.

# General Exercise Guidelines

The American Heart Association recommends a minimum 200 minutes of aerobic exercise a week, or about 30 minutes daily. You can split this up between different activities or exercises.

## ***How do I progress myself?***

- 1. Be mindful of your RPE. If you are at a low RPE (1-2), then you can either increase your time or the resistance/speed/incline**
  - a. Increase time by 1-3 minutes
  - b. Increase resistance by 1 notch
  - c. Increase speed by 0.1-0.2 mph
  - d. Increase incline by 0.5-1%
  
- 2. If you are performing a strengthening exercise follow these guidelines:**
  - a. Start with a weight that you can complete 2 sets of 10 repetitions
  - b. When this becomes easy, increase to 3 sets of 10 repetitions
  - c. When this becomes easy, increase to 2 sets of 15 repetitions
  - d. When this becomes easy, increase your weight by 1-5 lbs and return to 2 sets of 10 repetitions
  
- 3. Remember your guidelines**
  - a. SpO<sub>2</sub> must always remain above 93%
  - b. RPE must always be less than 4/10
  - c. Stop. Rest. Pace.