



BC ECHO for
Post-COVID-19
Recovery



Physical Rehabilitation for the Post-COVID 19 Patient

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Post-COVID-19

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Physical Limitations Affecting the Post COVID-19 patient: **Most Common Symptoms**

Post COVID-19 symptoms vary between individuals and affect multiple systems in the body

The top 3 most commonly reported debilitating symptoms are:

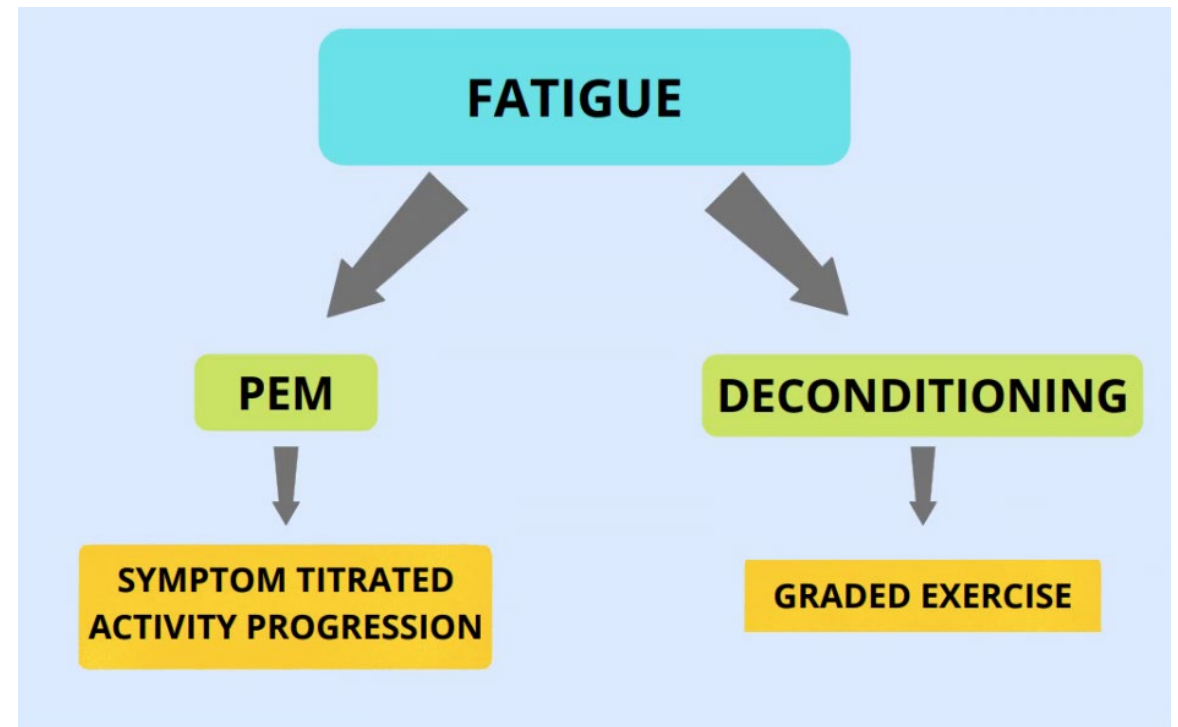
- **fatigue**
- headache
- attention disorder (memory loss & poor concentration)

Physical Limitations Affecting the Post COVID-19 patient: **Fatigue - Deconditioning vs PEM**

Common misconception: all Post-COVID fatigue & disability results from inactivity & deconditioning

Post-COVID patients experiencing **post-exertional malaise (PEM)** or **post-exertional symptom exacerbation (PESE)**, are **NOT** deconditioned nor are their symptoms explained by inactivity

For those experiencing PEM/PESE, graded exercise therapy is a common trigger for symptom relapse & therefore should be avoided



Fatigue - Deconditioning

Extreme deconditioning is expected after prolonged sickness and worse for those with ICU acquired muscle weakness

Those that don't have PEM/PESE can participate in **graded exercise**

Graded exercise:

- structured graduated strengthening & conditioning program
- gradually increases activity and improves function over time
- quota based (10 reps x 3 sets)
- start low and go slow (low intensity training)
- example: patients with interstitial lung changes would be appropriate for a Respiratory Rehab program which is a low intensity graded exercise program (as long as they don't have PEM/PESE)



Fatigue – PEM/PESE

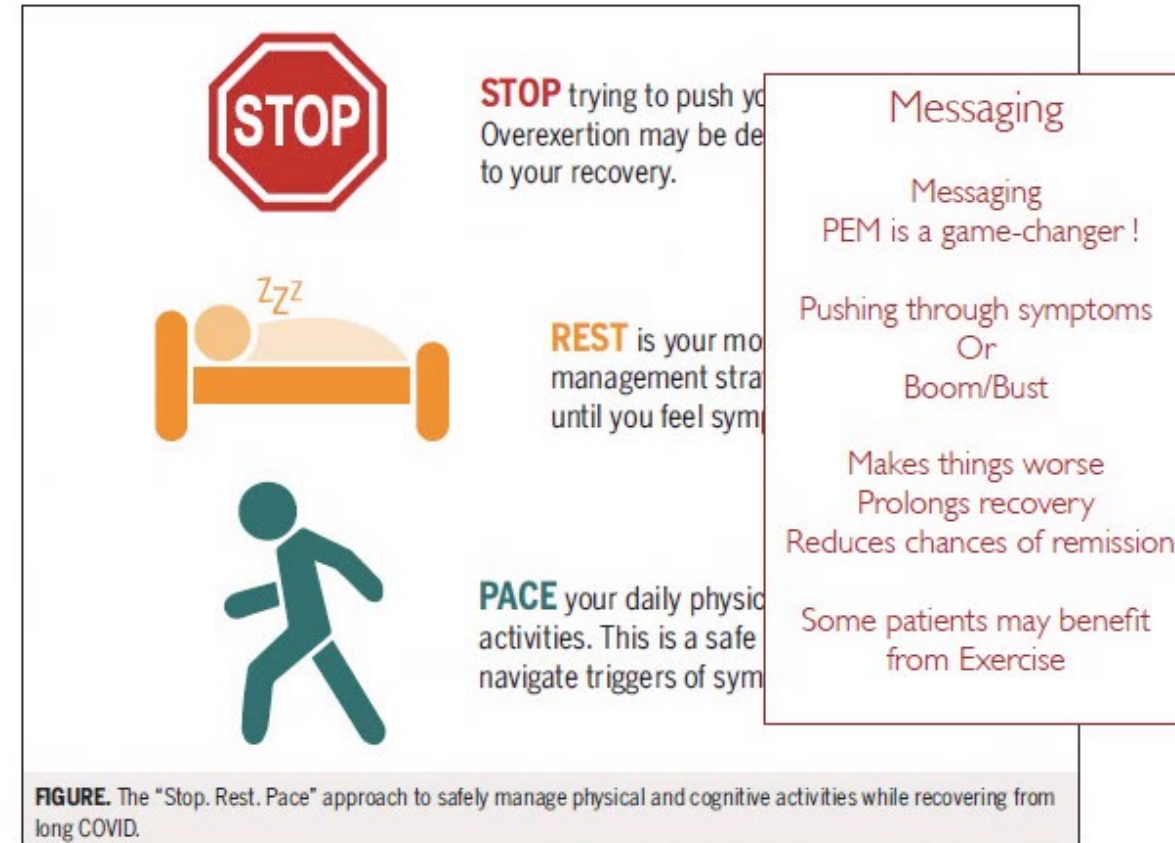
Fatigue is not always due to deconditioning

In PEM, debility is much greater than that seen with deconditioning; even mild physical/cognitive/social/emotional exertion can aggravate symptoms & in turn reduce function

Symptom titrated pacing:

- aim is to avoid symptoms and conserve energy
- physical & mental activities should be carried out in small manageable chunks with a period of rest or relaxation in between
- activity should be stopped before an exacerbation of fatigue or other symptoms occurs.

THEY CANNOT EXERCISE THEIR WAY OUT OF POST-COVID FATIGUE!



Distinguishing Between Deconditioning vs PEM

Ask the right questions:

- do you experience post-activity crashes?
- onset time between activity and symptoms?
- duration of symptoms?
- what are your top 3 symptoms of a crash?
- what activities do you do?
- how do you feel immediately after you do them, the next day, and beyond?

**IF THEY ARE NOT RECOVERING WITHIN 24 HOURS THEN IT IS MOST LIKELY
NOT JUST DECONDITIONING!**

Screening Tool for PEM

The PEM subscale of the DePaul Symptom Questionnaire (DSQ) can be used to assess PEM in Post-COVID

Asks patient to rate the severity and frequency of 5 statements about post-exertional malaise using a scale from 0 to 4

A frequency of at least 2 and a severity of at least 2 on any one of the 5 questions on the DSQ PEM subscale indicate that PEM is present

For each symptom below, please circle one number for frequency and one number for severity:
Please complete the chart from left to right.

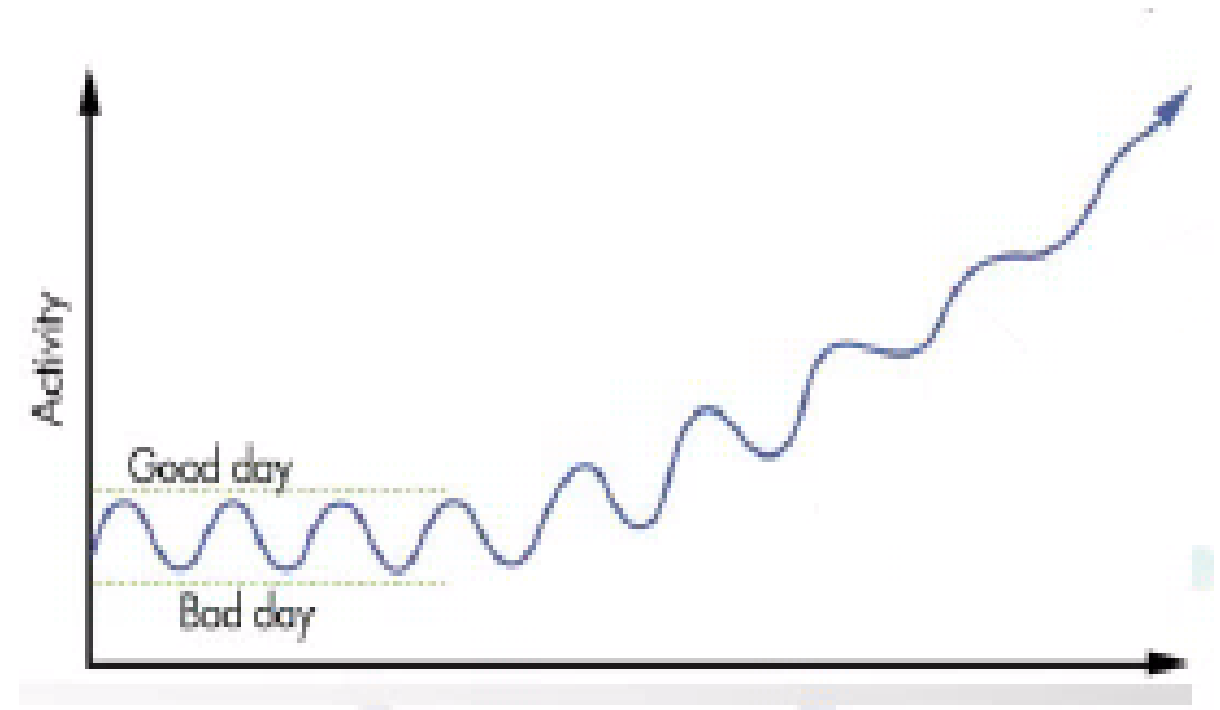
Symptoms	Frequency:	Severity:
	Throughout the <u>past 6 months</u> , how <u>often</u> have you had this symptom? For each symptom listed below, circle a number from: 0 = none of the time 1 = a little of the time 2 = about half the time 3 = most of the time 4 = all of the time	Throughout the <u>past 6 months</u> , how <u>much</u> has this symptom bothered you? For each symptom listed below, circle a number from: 0 = symptom not present 1 = mild 2 = moderate 3 = severe 4 = very severe
1. Dead, heavy feeling after starting to exercise	0 1 2 3 4	0 1 2 3 4
2. Next day soreness or fatigue after non-strenuous, everyday activities	0 1 2 3 4	0 1 2 3 4
3. Mentally tired after the slightest effort	0 1 2 3 4	0 1 2 3 4
4. Minimum exercise makes you physically tired	0 1 2 3 4	0 1 2 3 4
5. Physically drained or sick after mild activity	0 1 2 3 4	0 1 2 3 4

Slow Recovery – Fluctuations & Relapses

Recovery can be **slow** & is usually **not linear**; such that there will be good days, bad days, as well as setbacks or relapses

Relapses can reduce the threshold at which symptom flares occur

This threshold improves over time if patients are able to avoid relapses



Progression of Physical Activity with Post COVID-19 patients: **Symptom Stabilization**

Management programs should aim to reduce & stabilize symptoms before increasing activity levels

Educate patients to **stop** pushing to the point of over-exertion

Instead encourage them to **rest** until symptoms stabilize

Encourage patients to think of rest as an activity & rest before they need to rest, by scheduling rest into their daily schedule



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.



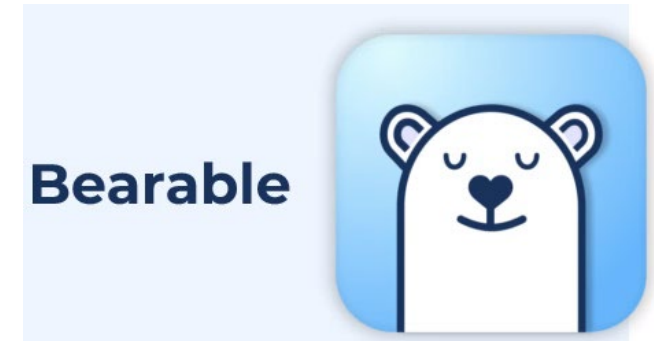
PACE your daily physical and cognitive activities. This is a safe approach to navigate triggers of symptoms.

Progression of Physical Activity with Post COVID-19 patients: **Energy Envelope & Activity Pacing**

Staying within their **energy envelope** by using energy conservation techniques is an effective way for them to manage their symptoms & avoid relapses

Teach patients how to find their energy envelope

- track symptoms
- journal daily activities (**physical/mental/social/emotional**)



Only once symptoms are stable, encourage them to utilize diligent pacing strategies, to build up activity within their energy envelope

Energy Conservation: the 4 P's & the 3 D's

Staying within the limit

Energy Conservation and Pacing- the "4Ps"



Staying within the limit

Energy Conservation and Pacing- the "3Ds"

Delete



Delegate



Defer



THE 4 P'S



Plan

Take time each night to review the day and plan the next day

List activities and schedule tasks that need to be done

Schedule in breaks e.g. activity-break-activity-break

Do your activities based on when you feel best. e.g. if you feel best in the morning schedule more difficult tasks for the morning



Pace

Break up a task by doing a little each day

Take your time to do each task

Plan to take a break before you feel tired

Spread your "energy drainers" over the week

Consider using heart rate monitoring or an activity journal to help you pace



Prioritize

Decide which activities are most important to you and do these first

Invest your energy wisely

Schedule in "energy boosting activities"



Position

Think about how you are positioning your body when you do activities and aim to save energy using equipment when you can.

Some examples are:

- Sit down when you are cooking or washing
- Avoid lifting and carrying objects, put them in a cart
- Use both hands if you do need to lift something
- Store items you use often within easy reaching distance

THE 3 D'S



Delete

Remove any non essential or unnecessary tasks from your "to do" list



Delegate

If a task doesn't specifically require you to be there ask family or a friend to do it for you



Defer

Temporarily pause a task that doesn't need to be completed right away.

You can schedule it later once you feel up to it

Progression of Physical Activity with Post COVID-19 patients: **Pacing using Heart Rate Monitoring**

Their therapeutic zone will be the amount of activity/exercise that doesn't aggravate their symptoms

Initially this therapeutic zone could be very thin

In order to expand their energy envelope/therapeutic zone, teach patients to slowly build up their activity

Activity progression should be **symptom titrated** & patients should be taught to use **heart rate monitoring** as a biofeedback tool to pace themselves during activities to avoid over-exertion



Heart Rate Monitoring as a Biofeedback Tool

Activity Biofeedback

- Purchase a heart rate tracking device (heart rate watch or pulse oximeter)
- Maintain a heart rate log with daily activities (some watches will maintain a log for you)
- Calculate heart rate at anaerobic threshold
- Maintain heart rate below anaerobic threshold by using pacing strategies

How to Measure Your Effort With Daily Activities and Exercise Post COVID-19

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While you recover from COVID-19 it is important to monitor your effort during daily activities (washing, dressing, shopping etc.) or exercise to make sure that you don't become too tired.

Ideally, when doing activities or exercise, you should aim for no more than "moderate effort" – your breathing and heart beating a little bit harder/faster but not to the point that you are breathless or your heart is pounding.

There are 2 main ways to check how hard your body is working during activity or exercise:

1. Heart rate – how many times your heart beats over one minute.
2. Rating of Perceived Exertion (RPE) – how hard you think you are pushing yourself during activity or exercise.

Heart Rate

You can measure your heart rate (pulse) by counting the number of times you feel your heart beat, using 2 fingers placed lightly on either your neck (just under end of your jaw bone) or wrist (in the small space under your thumb), for 1 minute. If you have a smart watch or FitBit you can simply check the heart rate records.



A "moderate effort" for activity or exercise aim should keep your heart rate at about 50%-70% of the maximum heart rate recommended for your age. The table below shows examples of the maximal heart rate and 50-70% of your maximal heart rate based on your gender and age. For example, if you are a 60-year-old male, when exercising, your "target" heart rate should be between 80-112 beats per minute (which is 50-70% of the recommended maximum heart rate of 160 beats per minute). This means that you should try to work a little harder if your heart rate is below 80 beats per minute but ease up on your effort if your heart rate is more than 112 beats per minute. When recovering from COVID, aim to keep at this level of effort for 5 minutes then gradually add 1-2 minutes per day to eventually exercise for a total of 30 minutes.

If you have symptoms of, or have been diagnosed with, Post Exertional Malaise (PEM), please speak with your doctor or physiotherapist before very carefully trying to increase your activity. PEM is an abnormal response to minimal levels of physical, cognitive, or socioemotional/psychological exertion. Stop, rest and pace if your symptoms get worse with even a tiny increase in activity. More information can be found on the PHSA website.



DOES NOT APPLY TO PATIENTS WITH POTS OR ON BETA BLOCKERS!

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AGE		20	30	40	50	60	70	80	90
MEN	Maximum heart rate	200	190	180	170	160	150	140	130
	50 - 70% of maximum heart rate (Target)	100 - 140	95 - 133	90 - 126	85 - 119	80 - 112	75 - 105	70 - 98	65 - 91
WOMEN	Maximum heart rate	168	173	170	162	154	145	136	127
	50 - 70% of maximum heart rate (Target)	84 - 132	87 - 125	85 - 119	81 - 113	77 - 108	73 - 102	68 - 95	64 - 89

Progression of Physical Activity with Post COVID-19 patients: **A Symptom Titrated Approach**

Once symptoms are stable, they can be encouraged to increase activity by a small increment (~10 %), then track symptoms for the days following

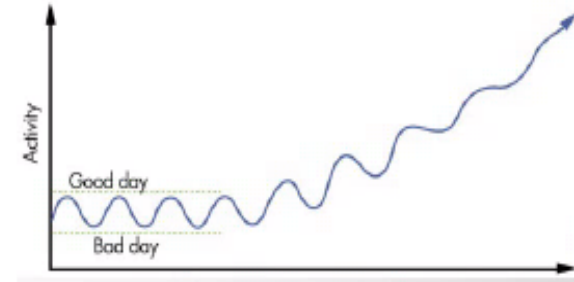
If they experience a symptom flare, then they need to scale back the activity, but if symptoms are stable, then they can continue to progress their activity in the same manner

Rehab is a SLOW careful process!

Expanding the limit

SLOWLY building up activity

- Symptoms are stable
- Try new (small) activity
- Track symptoms for days following
- Symptom flare = scale back
- Symptoms are stable = try new (small) activity



Progression of Physical Activity/Exercise with Post COVID-19 Patients

PHASE	POST COVID-19 PHASED AND SYMPTOM TITRATED INTERVENTIONS
INITIAL	<ul style="list-style-type: none"> -screen for PEM/PESE & POTS, cardiac issues, LFT's/exertional desaturation, etc. -determine prominent symptoms and baseline activity level -provide support: listen, empathize, validate, advocate
1	<ul style="list-style-type: none"> -education re: breathing pattern disorders (assess respiratory rate & SpO₂ if possible) & management of dyspnea -breathing re-training (breath control & diaphragmatic breathing – “NOSE, LOW, SLOW”) -education re: rest/relaxation techniques
2	<ul style="list-style-type: none"> -education re: management of fatigue & PEM/PESE (provide tools: energy envelope & symptom journal) -education re: pacing (4P's & 3D's) -stretching exercises for chest expansion (rib cage and lungs)/posture -education re: management of POTS, cough (dry vs productive), etc.
3	<ul style="list-style-type: none"> -education re: pacing using HR monitoring -recovery breathwork with AROM exs in supine – monitoring RPE, symptoms, HR
4	<ul style="list-style-type: none"> -incorporate seated/chair exs when and if stable – monitoring RPE, symptoms, HR -incorporate light weights when and if stable
5	<ul style="list-style-type: none"> -incorporate standing exs when and if stable– monitoring RPE, symptoms, HR -education re: walking intervals or recumbent bike/rower intervals to be initiated when stable

**ALWAYS MONITOR RESPONSE TO INTERVENTION - ALL ACTIVITY/EXERCISE IS SYMPTOM LIMITED AND HEART RATE PACED!
GO SLOW & DO NO HARM - PROGRESS ONLY WHEN SYMPTOMS ARE STABLE (NOT TIME-FRAME BASED)!**

Home POTS Test

Instructions:

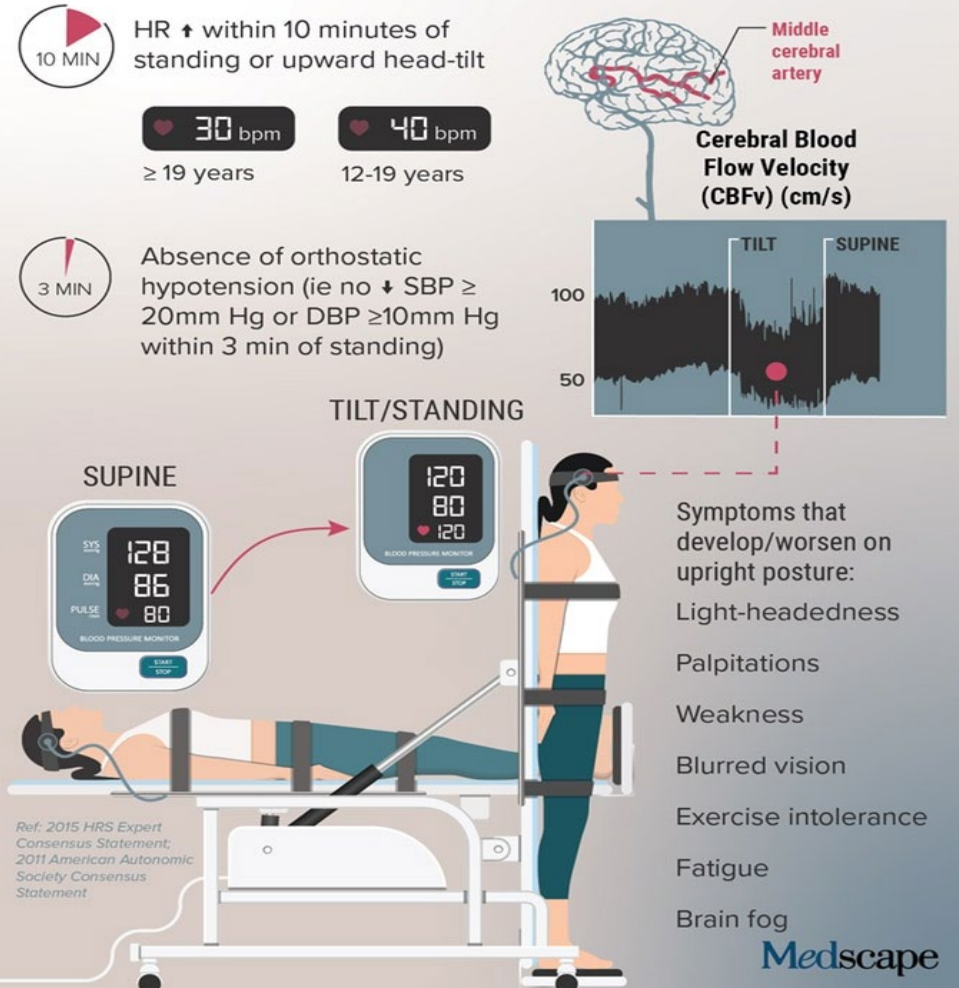
- Lie down for 5-10 minutes.
- Take your resting pulse after you've been lying down for a few minutes.
- Stand up and recheck your pulse immediately upon standing.
- Recheck your pulse at 1, 3, 5 and 10 minutes of standing.

You may have POTS if your heart rate spikes to **more than 120 beats per minute** or **increases by more than 30 beats per minute** at any time during the 10 minutes. You can stop the test.

Note: Lie down immediately if you feel like you're going to faint.

Bring the results to your next visit with your family doctor.

Postural Orthostatic Tachycardia Syndrome (POTS)



Breathing Re-Training

Breath Control & Diaphragmatic Breathing

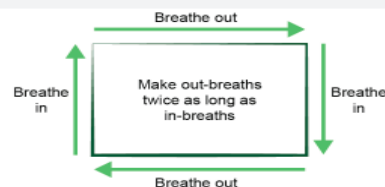
“NOSE, LOW, SLOW”

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Breathe a Rectangle

Once you have found a comfortable position, look around for a rectangle. This might be a window, a door, picture or television screen. Now follow the sides of the rectangle, tracing them with your eyes, as you breathe - breathing in when you are tracing the short sides and breathing out when you are tracing the long sides. Gradually slow the speed at which your eyes move around the rectangle, pausing at the corners to help slow your breathing.



Breath Control (tummy breathing)

When breathing you should see your tummy rise and fall as you breathe in and out. Practicing control of your breathing can help improve your breathlessness and strengthen your diaphragm muscle:

1. Sit comfortably with your back well supported.
2. Place a hand on your tummy just beneath your ribs – don't press too hard.
3. Keep your breathing steady and relaxed – do not take deep breaths.
4. Your hand should move forward as you breathe in, and back as you breathe out – this means that your diaphragm is working properly.

Try to do this for 3-4 times minutes, 3-4 times per day.

Be kind to yourself

You should expect to have some days that are better than others. The progress will likely not be consistent or predictable. Do not compare today's results to that of yesterday, or to how you were prior to your illness, or to other people.

Remember that practicing diligent pacing strategies and staying within your energy envelope is an effective way of managing breathlessness.

Breathing exercises

Breathing exercises can help your lungs recover after COVID-19. As well as helping you deal with feelings of anxiety and stress, breathing exercises can help restore diaphragm function and increase lung capacity. Breathing should be effortless and quiet - if you can hear your breathing you may be working too hard.

A physiotherapist can guide you through the following exercises.

1	Breathing exercise while on your back	2	Breathing exercise while on your stomach	3	Breathing exercise while sitting	4	Breathing exercise while standing
Lie on your back and bend your knees so that the bottom of your feet are resting on the bed.		Lie on your stomach and rest your head on your hands to allow room to breathe.		Sit upright on the edge of a bed or in a sturdy chair.		Stand upright and place your hands around the sides of your stomach.	

- Place your hands on top of or around the sides of your stomach.
- Keep your mouth closed throughout.
- Breathe in gently through your nose and feel your stomach rise/expand.

- You don't have to breathe all the way in - save big breathing for activity.
- As you exhale, just let the air leave your lungs gently; you don't have to push or force the air out. Feel tension release as you breathe out.
- Repeat for one minute.

5	Yawn to a smile breathing exercise	6	Humming breathing exercise
<ul style="list-style-type: none"> - Sit upright on the edge of your bed or in a sturdy chair. - Reach arms overhead and create a big stretching yawn. - Bring your arms down and finish by smiling for three seconds. - Repeat for one minute. <p>This exercise incorporates motion with deep breathing, which helps increase coordination and build strength in the arms and shoulders. It also opens up the muscles in your chest to give the diaphragm space to expand.</p>		<ul style="list-style-type: none"> - Sit upright on the edge of your bed or in a sturdy chair. - Place your hands around the sides of your stomach. - With your lips closed, breathe in gently through your nose and feel your stomach rise/expand. - Once your lungs are full, keep your lips closed and exhale while humming, making the "hmmmmmm" sound. Notice how your hands lower back down. - Again, inhale through your nose, then exhale through your nose while humming. - Repeat for one minute. 	

This information has been adapted from the following sources:
www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/coronavirus-recovery-breathing-exercises;
www.physiotherapyforbpd.org.uk/wp-content/uploads/2017/06/YOUR-Guide-to-Good-Breathing.pdf

Do not begin exercises, and contact your doctor, if you have: a fever; shortness of breath or difficulty breathing while resting; chest pain or palpitations; new swelling in your legs.
STOP exercise immediately if you develop any of the following symptoms: dizziness; shortness of breath more than normal; chest pain; cool, clammy skin; excessive fatigue; irregular heartbeat; any symptoms you consider an emergency.

Supine Exercises

(Autonomic Conditioning Therapy for Post-Acute Covid-19 Syndrome)

1. Breathing | Diaphragmatic



Sets: Repeat before each exercise
Reps: 5-6 breaths
Tempo: aim for 8-12 breaths per min

2. Heel Slides - Alternating



Sets: 1
Intensity: RPE 2 (light)
Duration: 30 seconds

3. Hip Abduction - Alternating



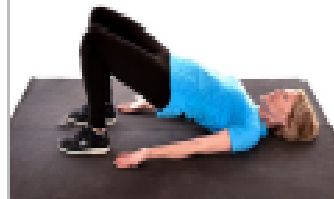
Sets: 1
Intensity: RPE 2 (light)
Duration: 30 seconds

4. Straight Leg Raise - Alternating



Sets: 1
Intensity: RPE 2 (light)
Duration: 30 seconds

5. Bridge



Sets: 1
Intensity: RPE 2 (light)
Duration: 30 seconds

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Symptom Titrated Exercise

Initiation of a Walking Program

Each progression is performed over a minimum of 1 week, and increased based on feeling well for the entire week (avoid the post exertional malaise fatigue).

The intensity of the exercise is very light.

When you finish your walk you should feel like you haven't really done anything.

Take as much time as you need between repeats, minimum of 1 minute at all levels.

Don't progress unless you feel you are ready; it's ok to progress slower or even move backwards until your energy levels improve and start to build again from that point.

Don't be afraid to turn daily exercise in to alternating days! Especially as intervals get longer!

Week	Repeats	Duration	Intensity	Frequency
1	5	1 minute	easy	daily
2	5	70 seconds	easy	daily
3	5	80 seconds	easy	daily
4	5	90 seconds	easy	daily
5	3	2 minutes	easy	daily
6	4	2 minutes	easy	daily
7	5	2 minutes	easy	daily
8	6	2 minutes	easy	daily
9	4	3 minutes	easy	daily
10	5	3 minutes	easy	daily
11	6	3 minutes	easy	daily
12	4	4 minutes	easy	daily
13	5	4 minutes	easy	daily
14	4	5 minutes	easy	daily
15	3	6 minutes	easy	daily
16	4	6 minutes	easy	daily
17	3	8 minutes	easy	daily
18	2	10 minutes	easy	daily
19	2	13 minutes	easy	daily
20	2	15 minutes	easy	daily
21	1	20 minutes	easy	daily
22	1	22 minutes	easy	daily
23	1	25 minutes	easy	daily
24	1	28 minutes	easy	daily
25	1	30 minutes	easy	daily
26	1	35 minutes	easy	daily

PHSA Symptom Management Resource Sheets

Managing Fatigue in Post COVID-19 Recovery with Pacing

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Why is pacing important?

After getting COVID-19, you may find you have less energy than you did before. Everyday tasks that need physical, cognitive (thinking), and/or emotional effort may be exhausting.

You may notice that if you “push through” your symptoms, you feel worse. This is often called over-exertion.

Over-exertion can lead to an unhelpful pattern where you “go until you can’t go any more” and then “crash” with worsened symptoms. This can force you to rest and may result in spending a lot of time stuck in bed or unable to go out.

This handout includes some tips on how to avoid the “push and crash” pattern and start better routines.



What is Pacing?

Pacing is a way to approach activity so that you can reduce the “big ups and downs” in your symptoms.

Pacing is about being smart about how you use your energy. Think of it like how you carefully manage money in a bank account – like “budgeting” your energy so that it does not run out. You can spread your energy out over days, weeks and months. This will make sure that you have enough energy to do in the things that are most meaningful to you.

How to Pace Yourself

All activities take some form of energy (physical, cognitive, or social/emotional/spiritual) and are therefore “energy draining”. Different activities may drain different types of energy. For example, vacuuming may drain physical energy, reading a book may take cognitive energy and having a friend over to dinner may drain social energy. Different activities may also drain different amounts of energy. For example it will likely take more physical energy to mow the lawn than it would to cook dinner.

The only way to increase energy in your “energy bank account” is by frequently stopping and resting. You must balance your “energy spending activities” with “energy saving activities” in order to stay within your “Energy Envelope”. Your “Energy Envelope” is the amount of activity you can do without your symptoms worsening (link to handout on PEM).



Adapted from: www.concussion.vch.ca/pacing

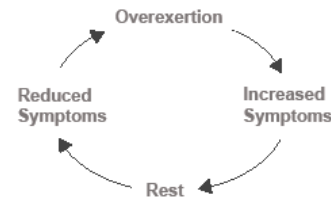
Page 1 of 3

Post-Exertional Malaise in Post COVID-19 Recovery and Finding your “Energy Envelope”

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Some people who are recovering from COVID-19 have times where they feel exhausted, have difficulty thinking, and other symptoms after a minimal amount of activity – this is known as post-exertional malaise (PEM). These symptoms are similar to those reported with “myalgic encephalomyelitis” or “chronic fatigue syndrome”. The symptoms can occur 24-72 hours after activity and perhaps last for days or weeks and are often referred to as “crashes”.

Some people with PEM experience a cycle of “push and crash”. They find themselves caught in a frustrating loop, swinging between over-activity and forced rest. When their symptoms are low, they push to get as much done as they can, this overexertion triggers an increase in symptoms, which in turn leads to forced rest or a crash.



To avoid the cycle of “push and crash”, you can use pacing strategies. Pacing means that you spread out your activities into “little bits” with rest periods in between the activities so you do not overdo activity and worsen your symptoms. This idea of staying within your limits and avoiding “crashes”, is what we call staying in your “Energy Envelope”.

Staying within your Energy Envelope offers the possibility of a more stable and predictable life. You can live your life according to a plan, rather than always reacting to your symptoms, giving you a sense of managing your illness, rather than it controlling you.



Some people with PEM experience a cycle of “push and crash”. They find themselves caught in a frustrating loop, swinging between over-activity and forced rest. When their symptoms are low, they push to get as much done as they can, this overexertion triggers an increase in symptoms, which in turn leads to forced rest or a crash.

Push and crash leads to feeling like things are not controllable. It can be very discouraging.



Adapted from: www.cfsselfhelp.org/pacing-tutorial

Page 1 of 3

Managing Breathlessness in Post COVID-19 Recovery

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It is very common for people recovering from COVID-19 to feel breathless. Breathlessness can occur for many reasons. It can make people feel scared, anxious or panicky and it may limit their activities.

The following ideas may help you feel less breathless. You might find some of them more helpful than others. Try them out and use the ones that you find most helpful:



Resting Positions

Use these 3 positions to help ease your breathlessness when you are resting or after you have just finished an activity.

Try to relax your hands, wrists, shoulders, neck and jaw as much as possible.

You can use any position that you find comfortable for breathing – you may wish to try changing positions.



Pursed Lip Breathing

Step 1: Breathe in gently through your nose

Step 2: Purse your lips as though you’re going to blow out a candle and blow out through your pursed lips for as long as is comfortable. This helps empty all of the air out of your lungs.

Repeat steps 1 & 2 three to five times.

Step 3: Breathe normally for 1 minute.

You can use these 3 steps whenever you are feeling breathless.



Page 1 of 2

Information Sheets by World Physiotherapy

Fatigue and post-exertional symptom exacerbation

World PT Day 2021

FATIGUE

Fatigue is a feeling of extreme exhaustion and is the most common symptom of Long COVID. It:

- is not easily relieved by rest or sleep
- is not the result of unusually difficult activity
- can limit functioning in day-to-day activities
- negatively impacts quality of life



PESE

Post-exertional symptom exacerbation (PESE) is a disabling and often delayed exhaustion disproportionate to the effort made. It is sometimes described as a "crash". The activity that can trigger this worsening of symptoms can be something that was easily tolerated before, such as:

- a daily activity (eg a shower)
- a social activity
- walking (or other exercise)
- reading, writing or working at a desk
- an emotionally charged conversation
- being in a sensory environment (eg loud music or flashing lights)



Many of the symptoms experienced by those living with Long COVID are very similar to those of myalgic encephalomyelitis (ME)/chronic fatigue syndrome (CFS).

The World Health Organization recommends that Long COVID rehabilitation should include educating people about resuming everyday activities conservatively, at an appropriate pace that is safe and manageable for energy levels within the limits of current symptoms, and exertion should not be pushed to the point of fatigue or symptom exacerbation.



PESE is most often triggered by physical activity and exercise. Nearly 75% of people living with Long COVID still experience PESE after 6 months.

The symptoms worsened by exertion can include:

- disabling fatigue/exhaustion
- cognitive dysfunction or "brain fog"
- pain
- breathlessness
- heart palpitations
- fever
- sleep-disturbance
- exercise intolerance

Symptoms typically worsen 12 to 48 hours after activity and can last for days, weeks or even months.

Your physiotherapist can guide you in pacing as an activity management tool that is also used successfully for people with ME/CFS to prevent triggering PESE.

- STOP** trying to push your limits. Overexertion may harm your recovery.
- REST** is your most important management strategy. Do not wait until you feel symptoms to rest.
- PACE** your daily activities and cognitive activities. This is a safe approach to navigate triggers to symptoms.

Physical activity and exercise interventions warrant caution as rehabilitation strategies among people with Long COVID and persistent symptoms of disproportionate breathlessness on exertion, inappropriately high heartbeat (tachycardia), and/or chest pain.
Graded exercise therapy should not be used, particularly when post-exertional symptom exacerbation is present.



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.

1 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.



2 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.



3 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.



4 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.



5 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.



Breathing exercises

World PT Day 2021

Breathing exercises can help your lungs recover after COVID-19. As well as helping you deal with feelings of anxiety and stress, breathing exercises can help restore diaphragm function and increase lung capacity. Breathing should be effortless and quiet – if you can hear your breathing you may be working too hard.

A physiotherapist can guide you through the following exercises.

- | | | | |
|--|---|---|--|
| <h3>1 Breathing exercise while on your back</h3> <p>Lie on your back and bend your knees so that the bottom of your feet are resting on the bed.</p> | <h3>2 Breathing exercise while on your stomach</h3> <p>Lie on your stomach and rest your head on your hands to allow room to breathe.</p> | <h3>3 Breathing exercise while sitting</h3> <p>Sit upright on the edge of a bed or in a sturdy chair.</p> | <h3>4 Breathing exercise while standing</h3> <p>Stand upright and place your hands around the sides of your stomach.</p> |
|--|---|---|--|

- Place your hands on top of or around the sides of your stomach.
- Keep your mouth closed throughout.
- Breathe in gently through your nose and feel your stomach rise/expand.
- You don't have to breathe all the way in – save big breathing for activity.
- As you exhale, just let the air leave your lungs gently; you don't have to push or force the air out. Feel tension release as you breathe out.
- Repeat for one minute.

- | | |
|---|---|
| <h3>5 Yawn to a smile breathing exercise</h3> <ul style="list-style-type: none"> - Sit upright on the edge of your bed or in a sturdy chair. - Reach arms overhead and create a big stretching yawn. - Bring your arms down and finish by smiling for three seconds. - Repeat for one minute. <p>This exercise incorporates motion with deep breathing, which helps increase coordination and build strength in the arms and shoulders. It also opens up the muscles in your chest to give the diaphragm space to expand.</p> | <h3>6 Humming breathing exercise</h3> <ul style="list-style-type: none"> - Sit upright on the edge of your bed or in a sturdy chair. - Place your hands around the sides of your stomach. - With your lips closed, breathe in gently through your nose and feel your stomach rise/expand. - Once your lungs are full, keep your lips closed and exhale while humming, making the "hmmmmmm" sound. Notice how your hands lower back down. - Again, inhale through your nose, then exhale through your nose while humming. - Repeat for one minute. |
|---|---|

This information has been adapted from the following sources:
www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/coronavirus-recovery-breathing-exercises;
www.physiotherapyforbpd.org.uk/wp-content/uploads/2017/06/YOUR-Guide-to-Good-Breathing.pdf

Do not begin exercises, and contact your doctor, if you have: a fever; shortness of breath or difficulty breathing while resting; chest pain or palpitations; new swelling in your legs.
STOP exercise immediately if you develop any of the following symptoms: dizziness; shortness of breath more than normal; chest pain; cool, clammy skin; excessive fatigue; irregular heartbeat; any symptoms you consider an emergency.



Patient Case Scenario


- Post-COVID, 1 year post infection, functioning at 25-30% pre-COVID levels, has PEM
 - Walks 5 minutes in the morning and afternoon, below anaerobic threshold
 - 3 x 20 minutes of cognitive activity per day
 - Started on gentle stretches in supine position for last 2 months, incorporating breathing exercises
 - Patient stabilized symptoms with no flares
 - Started 4 supine exercises with 1 minute rest in between each exercise, incorporating recovery breathwork, for past 1 month

Physical Rehabilitation Tools & Resources

- Symptom management resource sheets and videos (breathlessness, fatigue/PEM/pacing vs graded exercise, dysautonomia/POTS, etc):
<http://www.phsa.ca/health-info/post-covid-19-care-recovery#Self-Care--Info>
- Living in Your Energy Envelope tool, Symptom Tracking journal, pacing using heart rate monitoring:
<http://www.phsa.ca/health-info/post-covid-19-care-recovery#Additional--Care--Info>
- Previous ECHO sessions video recordings and slides:
<http://www.phsa.ca/health-professionals/education-development/bc-echo-for-post-covid-19-recovery#Past--Sessions>
- COVID-19 briefing paper: Safe rehabilitation approaches for people living with Long COVID: physical activity and exercise
 - <https://world.physio/covid-19-information-hub/long-covid>
- Information sheets by World Physiotherapy:
<https://longcovid.physio/quick-access>
- Link to ACT for PACS article and Appendix (Mount Sinai Long COVID Recovery programme) :
<https://assets.researchsquare.com/files/rs-440909/v1/2d114b41-2789-41d2-8ce5-68097594b3a9.pdf?c=1631881293>
<https://assets.researchsquare.com/files/rs-440909/v1/9ea5814f40cbe4c912e248b4.pdf>


Previous ECHO Sessions: Video Recordings & Slides

<http://www.phsa.ca/health-professionals/education-development/bc-echo-for-post-covid-19-recovery>




The screenshot shows the website header for the Provincial Health Services Authority. It includes a logo of British Columbia, the text "Provincial Health Services Authority", and social media icons for LinkedIn, Twitter, and Facebook. A navigation menu contains "Our Services", "Health Info", "Our Research", "About", and "Contact". Below the menu is a breadcrumb trail: "Menu", "Health Professionals / Education & Development / BC Echo for Post-COVID-19 Recovery". The main heading is "BC ECHO for Post-COVID-19 Recovery". The text describes a free virtual learning community for health-care providers. It mentions that the program is based on the "global ECHO model" and aims to improve care for patients recovering from "symptoms post-COVID-19". It also states that each monthly session is one hour long, starting with a 20-minute presentation from specialists on participant-identified topics, followed by a case presentation and Q&A.

Provincial Health Services Authority

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Menu  Health Professionals / Education & Development / [BC Echo for Post-COVID-19 Recovery](#)

BC ECHO for Post-COVID-19 Recovery

This free virtual learning community gives health-care providers the help and support needed to care for patients experiencing symptoms after COVID-19 infection.

Based on the [global ECHO model](#), the BC ECHO for Post-COVID-19 Recovery is a virtual learning community of specialists and community health-care providers who use instructive and case-based learning to improve care for patients recovering from [symptoms post-COVID-19](#).

Each monthly ECHO session is one hour, and starts with a 20-minute presentation from specialists on participant-identified topics, followed by a case presentation submitted by a participant. Each session will wrap up with resources and recommendations, and an opportunity for Q&A.

Upcoming Sessions Past Sessions About

The current cycle of our ECHO runs July 2021 to July 2022. Register for an

Network partners





Returning to Work after COVID-19

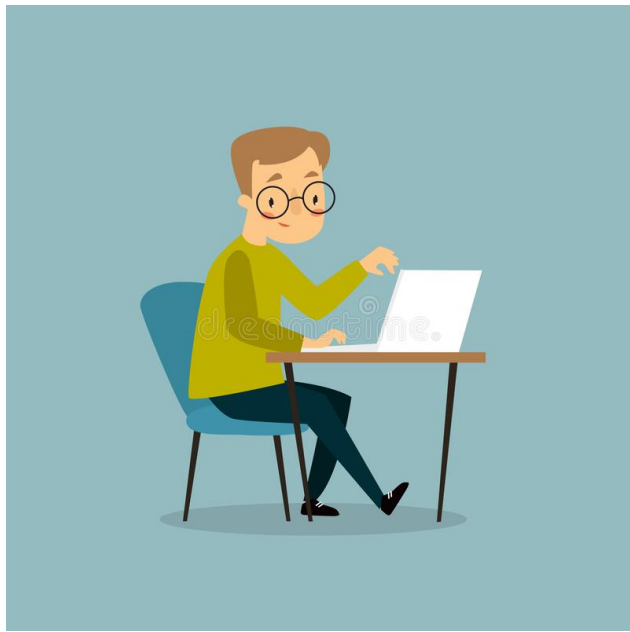
Jennifer K. Yao, MD, FRCPC
Physical Medicine & Rehabilitation

Post-COVID-19
Interdisciplinary Clinical Care Network
Recovery | Care | Research | Education

“Doc, when can I go back to work?”

General approach to return to work (RTW)

- Understand the social and environmental context of the patient, the job and the work environment
- Is the patient currently “job-attached”? (i.e. has a job waiting for their return)
- Is the patient on disability benefits through work (i.e. STD or LTD)?
- Assess readiness for RTW
- Determine additional resources needed for successful RTW
- Alternatives to paid work



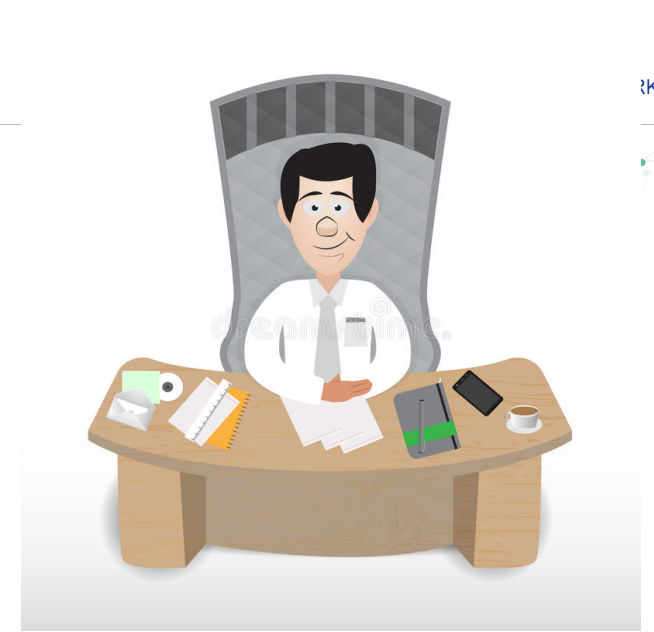
Dave Script

- 33 yo
- Not job attached
- Freelance writer
- Works from home
- Lives alone
- No benefits



Alice Safeway

- 42 yo
- Grocery store cashier
- Union job
- Takes transit to work
- 2 teenage kids
- On medical EI

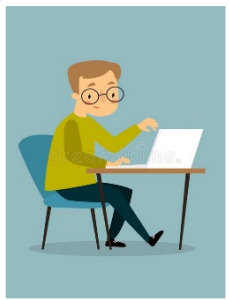


Peter Ledger

- 55 yo
- Corporate accounting manager
- Downtown office
- On short-term disability



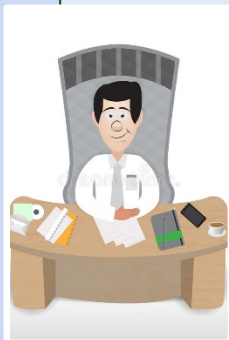
Are they ready to return to work?



Poor sleep
Fatigues easily
Screen tolerance <30 min
Low mood
Financial pressures



Sore muscles / body aches
Easy physical fatigue
Feeling overwhelmed
Delegating household tasks



Brain fog – slow processing, decreased concentration
Irritable, low frustration tolerance
Tachycardia and dizziness with exertion
Attending many medical appointments

- What are the physical, psychological and cognitive impairments and limitation?
- Do they have sufficient energy reserves to work after doing necessary daily tasks?
- How do symptoms fluctuate from day to day?
- Are there ongoing treatments / interventions that would interfere with return to work?
- Are there barriers getting to and from work?
- After returning from work, how much energy do they have to take on daily tasks?

Job characteristics and environment

Consider the following aspects of the job:

- Physical demands required – strength, endurance, positioning, climbing, etc.
- Temperaments required – people-facing, leadership, etc.
- Psychological and cognitive demands - situational awareness, level of focus
- Environmental variables of the job – e.g. field vs. office, predictability of workload, level of sensory stimulation, ability to control one's time / activities

What supervision and supports may be available?

What accommodations may be realistic?



Examples of Accommodations

- More frequent rest breaks
- Quieter workspace
- Access to rest space
- Time off for health appointments / treatments
- Start return to work with more routine, less demanding tasks first
- Work from home on some days
- Job reassignment or retraining

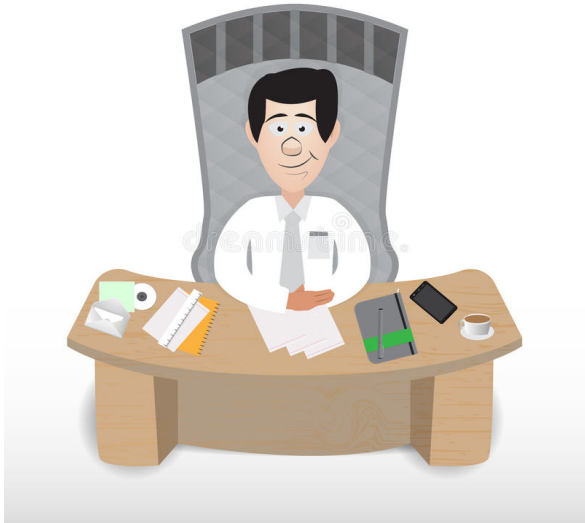


Graduated return to work plan - Alice



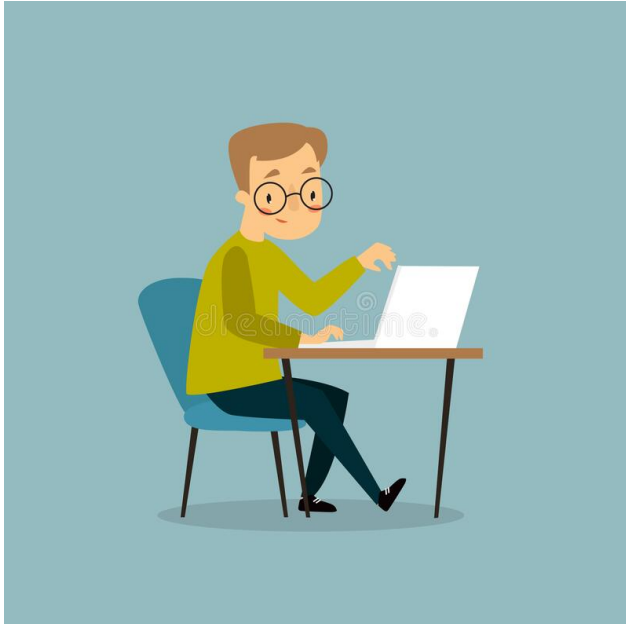
- Weeks 1,2 – Half day Tuesday and Friday
- Weeks 3,4 – Half day Tuesday, Thursday, Friday
- Weeks 5,6 – Half day Mon, Tues, Thus, Friday
- Weeks 7-9 – Full day Mon, Thurs; Half day Tues, Fri
- Weeks 10-12 – Full days Mon, Tues, Thurs, Fri
- Weeks 13 – Full days Monday – Friday
- Monitor symptoms as weeks progress
- May need to hold progression for a week or longer if unable to progress to next stage

Graduated return to work - Peter



- Start with limited hours / days
- Start with more familiar and routine tasks with flexible deadlines
- Ensure opportunity for rest breaks
- Explore memory strategies
- May need another colleague to “check” the work
- Avoid large group meetings / presentations if possible

Return to work plan - Dave



- Breakdown writing time into 30 min chunks 2-3x per day to start
- Try dictation or writing rather than typing onto screen
- Build in rest periods or more restorative activities between writing times
- Consider what non-work tasks can be reduced or delegated (e.g. grocery delivery, make meals that can be consumed later in the week)
- Maintain sleep routine
- Explore other possible benefits and social supports

Not Job-Attached



Eligible for public employment services and employment counseling



Explore work options and preferences



Consider change of work, return to training / school, or retirement



Community vocational resources

Job-Attached

- If on leave, job-attached and receiving private STD/LTD, they are NOT eligible for public employment services
- Need to connect with own HR departments, occupational health, unions, WorkSafe if available
- May need medical letters or forms for recommended accommodations, graduated RTW plan, medical justifications, etc.

See BC ECHO presentation Nov. 9, 2021 on support for disability, programs and forms – Dr. Jill Calder

<http://www.phsa.ca/health-professionals/education-development/bc-echo-for-post-covid-19-recovery#Past—Sessions>

Additional resources

- Great resources from other organizations that are very helpful:
 - <https://www.cancerandwork.ca/healthcare-providers/assessment-of-work-abilities/>
- Resources from UK:
 - https://www.som.org.uk/COVID-19_return_to_work_guide_for_recovering_workers.pdf
- PHSA Post-COVID ICCN Website resource with video
 - <http://www.phsa.ca/health-info/post-covid-19-care-recovery#Additional--Care--Info>

Returning to Work

Returning to work can help you connect with others, relieve financial stress, and give you a sense of purpose. However, it can be challenging after COVID-19 to return to work. Stay off work until you feel well enough to return AND you have carefully planned how to make your return successful. Talk with your healthcare provider and your employer about what is best for you.

Below are some things to consider:

- Prepare by slowly increasing the demands (both social and cognitive [thinking]) at home and in your community first. Perhaps do some volunteer work for a short time. Monitor your response. Consider what changes are needed for your responsibilities at home. Ask others to help so you can continue your self-care routines. You may need extra support when you are first starting your return to work.
- If you feel ready, talk to your doctor and employer (Human resources / Occupational Health) about getting permission to return to your duties and perhaps slowly easing in by starting with those that are easiest. Ask for this plan in writing.
- Review your work responsibilities. Think about whether you are able to do everything that you usually do in your job. Discuss with your employer a return-to-work plan that ideally involves a gradual increase in duties over time and is reviewed often. Listen to your body. Watch your symptoms. Be prepared to make changes as you go. This can help prevent symptom flares that lead to missing more work. These steps are important to keep you on the path to recovery.
- Consider changing how you work if you can. Try to change your start and finish times, schedule more breaks, or work from home if possible. Start with lighter or less demanding tasks and limit distractions if you can. Remember the goal is to successfully balance your recovery and work.
- Be kind and patient with yourself. This process takes time for everyone.
- Your employer should be supportive in this gradual return to work. It can take weeks or months depending on your symptoms and your work. If your employer is not supportive, ask for help from your doctor, your union and/or disability case manager.
- If you are unable to meet the requirements of your job, consider extending your time off, changing your duties or moving into a different position if possible.



- If you think your medical condition is likely to affect your work long term, ask your doctor and employer about options. There are policies and legal requirements in place to guide the next steps in this process.

***Please review our Video Education Session which discusses returning to work after an illness. This module reviews how to assess if you are ready, steps to take, and explores tips for a successful and sustained return to work plan.**
<https://www.youtube.com/watch?v=beKcWMIgpc4>

The Post COVID Recovery Clinics do **not** fill out disability forms at this time. Please speak to your primary care provider for help.

If you require additional support or one-to-one assistance please visit:
<https://disabilityalliancebc.theightfbc.org/direct-service/apply-for-disability-benefits/>

An appointment can be made with an advocate at BC Disability Benefits Alliance by calling 604-872-1278 in the Lower Mainland - Toll Free: 1-800-663-1278



Alternatives to Paid Work



Work simulations



Volunteer work



Course auditing



Staying socially
connect with work
environment



Opportunity to
“reset” life priorities
and directions

BC ECHO for Post-COVID-19 Recovery sessions

Session #	Date	Topic	Presenter
1	July 13, 2021	Post-COVID-19 Recovery: What the family practitioner needs to know	Dr. Renee Janssen
2	August 10, 2021	Post-COVID-19 Recovery: An Overview of Long-Haulers	Dr. Ric Arseneau
3	September 14, 2021	Top 10 Challenges Faced by Family Practitioners in Caring for the Post-COVID Patient and How to Navigate Them	Dr. Zachary Schwartz, Dr. Peter Birks, and Dr. Aman Nijjar
4	October 12, 2021	Post-COVID-19 Neurological Symptoms and Rehabilitation	Dr. Evan Kwong, and Dr. Jennifer Yao
5	November 9, 2021	Post-COVID-19 Support for Persistent Disability, Programs and Required Forms	Dr. Jill Calder
6	December 14, 2021	Post-COVID-19 – A Mental Health Perspective	Dr. Grant Millar

BC ECHO for Post-COVID-19 Recovery sessions

Session #	Date	Topic	Presenter
7	January 11, 2022	Post-COVID-19 Recovery: What the family practitioner needs to know	Dr. Renee Janssen
8	March 8, 2022	Self-Management, Strategies, Resources and Tools for Common Post-COVID-19 Symptoms	Dr. Jesse Greiner, Dr. Jill Calder, and Elise Bocknek
9	April 12, 2022	Physical Rehabilitation and Return to Work for the Post-COVID-19 Patient	Dr. Jennifer Yao and Amy Sangha
10	May 10, 2022	Post-COVID-19 Recovery: An Overview of Long-Haulers	Dr. Ric Arseneau
11	June 14, 2022	Post-COVID-19 – A Cardiology Perspective	Dr. Krishnan Ramanathan
12	July 12, 2022	Post-COVID-19 – A Respiriology Perspective	Dr. Aditi Shah



Network partners

