



PRACTICAL IMPLICATIONS FOR LIFELONG STRENGTH DURING COVID-19

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- 2 Preliminary recommendations for early rehabilitation for COVID- 19 patients after hospital discharge and general guidelines for exercise
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1 PHYSIOTHERAPY MANAGEMENT FOR COVID-19 IN THE ACUTE HOSPITAL SETTING: CLINICAL PRACTICE RECOMMENDATIONS

- **Respiratory & functionality** supporting physiotherapy.

For patients with moderate to severe disease the two primary objectives of rehabilitation in this stage are promoting airway clearance and preventing complications of acute illness-related immobilization.

- Not all patients need respiratory physiotherapy.
- Workforce **planning and preparation** including:
Screening to determine indications for physiotherapy, delivery of pt interventions, personal protective equipment (PPE) requirements, staff planning, education etc.
- Safety and hygiene issues!

Recommendations for physiotherapists working with people with COVID-19



WHOM TO TREAT IN THE HOSPITAL?

- Physiotherapists provide interventions for airway clearance, mobility, exercise and rehabilitation.
- COVID-19 mostly associated with dry-non productive cough (rather than exudative consolidation) → no respiratory physiotherapy.
- If patients concurrently or subsequently develop exudative consolidation, mucous hypersecretion and/or difficulty clearing secretions → *respiratory physiotherapy*.
- If patients have comorbidities creating significant functional decline and/or ICU- acquired weakness or risk of it → *physiotherapy interventions* → *only* if clinical indicators → minimize staff exposure and the negative impact of unnecessary review of patients in isolation areas on PPE supplies.
- Actions require co-operation with medical staff to determine the indicators for physiotherapy review and screen according to the set/agreed guidelines.
- Screening via subjective review and basic assessment without direct contact with the patient should be tested first whenever possible (calling the patient into the isolation rooms and conduct subjective assessment for mobility information and providing education on airway clearance techniques).

Physiotherapy intervention	COVID-19 patient presentation (confirmed or suspected)	Physiotherapy referral
Respiratory	Mild symptoms without significant respiratory compromise (eg, fever, dry cough, no chest x-ray changes)	Physiotherapy interventions are not indicated for airway clearance or sputum sample collection No physiotherapy contact with patient
	Pneumonia presenting with features: <ul style="list-style-type: none"> • a low-level oxygen requirement (eg, oxygen flow ≤ 5 l/min for $SpO_2 \geq 90\%$) • non-productive cough • or patient coughing and able to clear secretions independently 	Physiotherapy interventions are not indicated for airway clearance or sputum sample collection No physiotherapy contact with patient
	Mild symptoms and/or pneumonia AND co-existing respiratory or neuromuscular comorbidity (eg, cystic fibrosis, neuromuscular disease, spinal cord injury, bronchiectasis, chronic obstructive pulmonary disease) AND current or anticipated difficulties with secretion clearance	Physiotherapy referral for airway clearance Staff use airborne precautions If not ventilated, where possible, the patient should wear a surgical mask during any physiotherapy
	Mild symptoms and/or pneumonia AND evidence of exudative consolidation with difficulty clearing or inability to clear secretions independently (eg, weak, ineffective and moist sounding cough, tactile fremitus on chest wall, wet sounding voice, audible transmitted sounds)	Physiotherapy referral for airway clearance Staff use airborne precautions If not ventilated, where possible, the patient should wear a surgical mask during any physiotherapy
	Severe symptoms suggestive of pneumonia/lower respiratory tract infection (eg, increasing oxygen requirements; fever; difficulty breathing; frequent, severe or productive coughing episodes; chest x-ray, CT or lung ultrasound changes consistent with consolidation)	Consider physiotherapy referral for airway clearance Physiotherapy may be indicated, particularly if weak cough, productive, evidence of pneumonia on imaging and/or secretion retention Staff use airborne precautions If not ventilated, where possible, the patient should wear a surgical mask during any physiotherapy Early optimisation of care and involvement of ICU is recommended

Mobilisation, exercise and rehabilitation	<p>Any patient at significant risk of developing or with evidence of significant functional limitations</p> <ul style="list-style-type: none"> • eg, patients who are frail or have multiple comorbidities impacting their independence • eg, mobilisation, exercise and rehabilitation in ICU patients with significant functional decline and/or (at risk of) ICU-acquired weakness 	<p>Physiotherapy referral</p> <p>Use droplet precautions</p> <p>Use airborne precautions if close contact required or possible aerosol generating procedures</p> <p>If not ventilated, where possible, the patient should wear a surgical mask during any physiotherapy</p>
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COVID-19 = coronavirus disease 2019, CT = computed tomography, ICU = intensive care unit, SpO₂ = oxyhaemoglobin saturation.

RECOMMENDATIONS FOR PHYSIOTHERAPY MOBILISATION, EXERCISE AND REHABILITATION INTERVENTIONS

Protective equipment
usage.

Importance of screening!
Nursing staff, patient,
family involvement.

No unnecessary entering in
the isolation space. Co-
operation with clinical staff.
Direct pt only when
significant functional
limitations.

Early mobilization is
advised but exercise
prescription needs careful
consideration of the
patients state.

Consider training and
assistive equipment carefully.

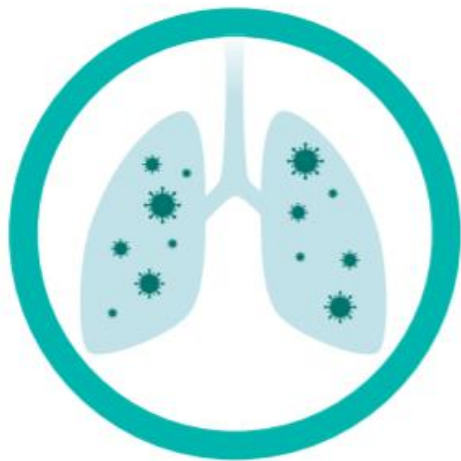
Plan well! Equipment,
therapy, staff.

Remember
patient safety.

2 PRELIMINARY RECOMMENDATIONS FOR EARLY REHABILITATION FOR COVID-19 PATIENTS AND GENERAL GUIDELINES FOR EXERCISE



People who have had severe cases of COVID-19 will need rehabilitation to recover from the effects of ventilation/oxygen support, prolonged immobilisation and bed rest. They may be suffering from:



- impaired **lung function**
- severe **muscle weakness**
- joint **stiffness**
- fatigue
- limited **mobility** and ability to do daily tasks
- delirium and other **cognitive impairments**
- difficulty **swallowing** and communicating
- **mental health** disorders and psychosocial support needs



Physiotherapy can play an important role in the rehabilitation of people who have been severely ill with COVID-19 in a hospital or other setting. These people are at risk of encountering (severe) limitations in physical, emotional, cognitive and/or social functioning.

PURPOSE OF (PHYSICAL) REHABILITATION AFTER DISCHARGE

- Supporting **recovery and functionality** gain.
- Returning to **daily activities** and **the society**.
- Preventing psychological disorders.
- Treating post discharge symptoms : fatigue, breathlessness, psychological distress, lower quality of life, pain, weakness, low exercise endurance.
- At discharge, an individual assessment of rehabilitation needs should be documented*
- Establishing comprehensive, holistic view of the rehabilitation.

MANY THINGS WE DON'T KNOW REGARDING COVID-19 BUT WHAT WE KNOW ABOUT ARDS AND ICU SURVIVORS, PATIENTS WITH SEVERE INFLUENZA A (H1N1) PNEUMONITIS, HOSPITALIZED PATIENTS WITH COPD AND PULMONARY REHABILITATIVE INTERVENTIONS COULD HELP...

- There is much we don't know about the rehabilitation needs, safety issues, organizing rehabilitation of COVID-19 patients → What is the expected impact of rehabilitative interventions?
- Prognosis for ICU- admitted patients is poor and 75-80% of the hospitalized patients have prolonged ward stays (± 21 days).
- Exercise capacity and quality of life can improve significantly following an 8-week pulmonary rehabilitation program (in survivors of ARDS due to severe influenza A (H1N1) pneumonitis). (3)
- Exercise training improves physical capacity, self-efficacy and readiness to exercise compared to usual care in patients discharged from the hospital following critical illness (mechanically ventilated >96hours). (2)
- The greatest change in physical function after diagnosis of acute respiratory failure appears to occur in the first 2 months after discharge. (4)

Box 1 Post-intensive care syndrome



Stam et al have highlighted the need to prepare for the aftershocks of the pandemic and ongoing rehabilitation needs associated with post-intensive care syndrome (PICS) and other severe conditions (Stam et al., 2020). Kiekens et al have described clinical experiences in Northern Italy indicating relatively long lengths of stay in the ICU units for patients with COVID-19, with immobilisation in the prone position. They describe specific problems in the post-acute phase such as severe muscle weakness, fatigue, joint stiffness, dysphagia, (neuro)psychological problems and impaired mobility and functioning, highlighting how crucial physiotherapists are in early and ongoing rehabilitation (Kiekens et al., 2020). The importance of coordinated rehabilitation approaches for patients with PICS, as part of the COVID-19 rehabilitation pathways, emphasises a multi-professional approach involving relevant health professionals and service providers across sectors to support individuals, families and carers (Smith et al., 2020).



Box 2 Post-viral fatigue syndrome

Physiotherapists have been highlighting the potential for people recovering from COVID-19 to develop post-viral fatigue syndrome (PVFS). Clague-Baker, a researcher from the University of Leicester (University of Leicester, 2020), notes that based on previous research on PVFS, up to 10% of people recovering from COVID-19 could develop the syndrome (Hickie et al., 2006, Moldofsky and Patcai, 2011). Physiotherapists should be aware of the signs and symptoms of PVFS and know the management strategies which should focus on rest, hydration and nutrition. If symptoms do not resolve by four to five months this could then be diagnosed as myalgic encephalomyelitis (ME). Physiotherapists should be familiar with the signs and symptoms of ME with the main symptom being post-exertional malaise (PEM) and know the appropriate treatment strategies. They should be aware that progressive physiotherapy can be harmful as people with ME have abnormal responses to exercise including: a lower anaerobic threshold, lower oxygen capacity, increased acidosis and abnormal cardiovascular responses (Carruthers et al., 2012). Appropriate management strategies include symptom-contingent pacing and heart rate monitoring (for advice see www.physiosforME.com).



SUMMARY OF ROYAL DUTCH SOCIETY FOR PHYSIOTHERAPY (KNGF) POSITION STATEMENT : PHYSIOTHERAPY RECOMMENDATIONS IN PATIENTS WITH COVID-19

- Patients with limitations (or severe risk of developing) of physical functioning have an indication for physiotherapy.
- There is still substantial uncertainty about the (duration of) contagiousness of COVID-19, or about the course of recovery, the physical capacity and physical limitations in patients who have had an active infection → the safety for the physiotherapist and their patients → caution when assessing and treating these patients.
- Physiotherapy should be provided adhering to principles of ‘social distancing’, e.g. using e-health, as much as possible.
- Always refer to the national guidelines on safety, infection control and transmission prevention.

INITIAL SIX WEEKS AFTER HOSPITAL DISCHARGE OR COVID-19 ILLNESS AT HOME

- During the first two weeks, contact the patient by telephone, e-consult or e-health to determine if any limitations are experienced in daily physical functioning and if there is an indication for physiotherapy.
- Advise the patient to gradually resume their activities of daily living and physical functioning. Ensure adequate monitoring of their daily physical functioning.
- Activities of daily living and additional exercise therapy should be performed at low to moderate intensity and with short interval durations.
- Use the following clinical outcome measures: the Patient Specific Functioning Scale, oxygen saturation and heart rate frequency, and the Borg Scale CR10 for Shortness of Breath and Fatigue. As maximum threshold for exercise intensity use a score of 4 (out of 10) on the Borg Scale for Shortness of Breath and Fatigue.
- Make sure patients are able to understand and apply adequate exercise load management (frequency, intensity, time/duration and type). Focus on physical functioning of activities of daily living.

AFTER SIX WEEKS

- Assessment → whether physiotherapy is indicated based on the patient's needs and their current, actual level of physical functioning.
 - Set further treatment goals related to physical activity and/or exercise capacity based on the exercise test and/or physical activity measurement.
 - Patient Specific Functioning Scale, Short Physical Performance Battery, hand-held dynamometer for grip strength, 6- Minute Walk Test and a pedometer / accelerometer to assess and evaluate the patient's daily physical functioning. Monitor oxygen saturation and heart rate frequency, and use the Borg Scale CR10 for Shortness of Breath and Fatigue before, during and immediately after physical exercise.
- Ensure a gradual increase in training frequency, intensity and time/duration based on the patient's needs, treatment goals and physical abilities.
 - During exercise, a score of 4 to 6 (out of 10) on the Borg Scale CR10 for Shortness of Breath and Fatigue and/or an intensity of 60-80% of the tested maximum exercise performance (e.g. bicycle test, 6MWT and/or the 1 RM) is recommended.

RECOMMENDATIONS FOR PHYSICAL ACTIVITY

NORMAL RECOMMENDATIONS

- **Exercise** 150 min/week, preferable 30 min/most days
- **Strength training** 2-3x/week
- **Healthy diet** with protein intake of at least 1.2 g/kg/day

COVID-19

- **Keep up exercise and activity:** walking, gardening, home exercises
- **Maintain muscle strength** by home exercises
- **Keep up a healthy diet** with a high protein content

RETURN TO NORMAL

- **Return** to normal exercise – **progressive strength training** to rebuild muscle
- **Healthy diet** with increased protein intake

HUR Gym – home-based alternative exercises



www.myactiveattitude.com.au

We have been contacted by clients for advice regarding possible home-based exercises to perform while not being able to go to the gym. While the benefits of the progressive resistance provided by HUR equipment cannot be replaced, it is still important to keep active with home-based exercises to maintain most of the strength gains you have made.



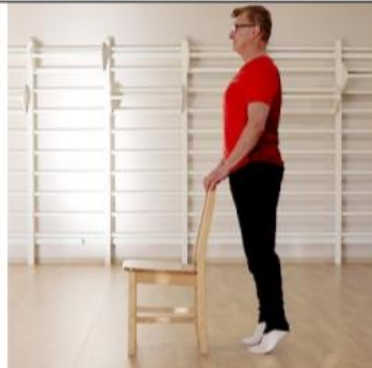
www.huraustralia.com.au

In this document you will find some ideas on exercises you can do instead of using your HUR gym equipment. You will also find a section containing balance exercises and stretches that you can do at home. When exercising at home, remember that the same safety precautions apply as at the gym – listen to your body, remember to breathe, do not rush your exercises. If you are unsure about doing any of these exercises, consult an accredited health professional. Aim to do 2 sets of 10 repetitions of each exercise.

Warm up exercises



March on the spot. You can alter your steps by sometimes lifting your knees higher, sometimes taking lower but fast steps or use a stepping board. Stand upright in front of a stepping board (or any stable, flat object). Step up on the board on leg at a time and straighten your body while stepping up.








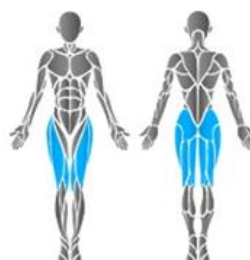



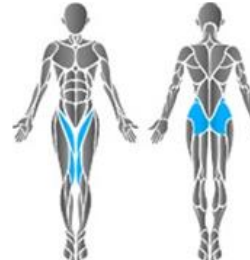


Heel raises are great for warming up, strengthening your calves and training balance. Hold on to a chair (or a table) and slowly raise to your toes, and lower back slowly.



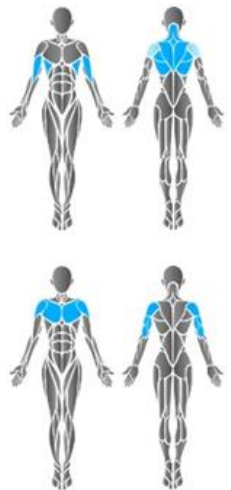


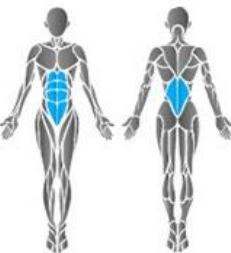




Stand upright with your feet shoulder-width apart. Swing your arms alternating back and forth in a relaxed manner. Bend your knees along the movement.



Sit or stand upright. Take at least a shoulder width grip on the physical activity stick (or a simple broom stick) and start to “paddle” in the air. Paddle from side to side and use a big movement.

Equipment	Muscle groups	Alternatives
 <p>Leg Extension/Curl</p>		<div data-bbox="743 278 1014 578">  <p>Sit stable on a chair with your back straight. If necessary, support yourself with your hands. Place potential weight or exercise band on your ankle. Extend your leg horizontal and return controlled into the starting position. Keep your other leg on the floor.</p> <p>Train both sides.</p> </div> <div data-bbox="1391 278 1593 578">  <p>Stand behind your chair (or table). Slowly <u>lift up</u> your heel, as high as you feel comfortable, then return back to the ground.</p> <p>Do the movement slowly.</p> </div>
 <p>Leg Press</p>		<div data-bbox="743 606 1014 921">  <p>Sit to stand Sit on a chair with your back straight. Lean forward and stand up. Sit back down in a controlled way.</p> </div> <div data-bbox="1391 606 1593 921">  <p>Stand with your feet hip-width apart, you can take support from a chair or a table. Squat down by shifting your hips back and down and keep your back in an upright, straight position. Make sure your knees and toes point straight ahead.</p> </div>
 <p>Adduction/Abduction</p>		<div data-bbox="743 949 1014 1263">  <p>Stand behind your chair (or table). Slowly <u>lift up</u> your leg to the side, as high as you feel comfortable, then return back to the ground. Remember to stand straight, do not lean to the side, try to activate your abdominals and buttocks.</p> </div> <div data-bbox="1391 949 1593 1263">  <p>Sit stable on a chair with your back straight, feet hip width apart on the floor. Place a wide pillow between your legs. Squeeze the pillow for 10 seconds, then relax. Remember to breathe normally while activating your muscles.</p> </div>

Equipment	Muscle groups	Alternatives	
  Chest Press Optimal Rhomb			<p>Stand approximately one step away from the wall, facing the wall.</p> <p>Place your palms on the wall at shoulder level or slightly below.</p> <p>Lower yourself toward the wall by bending your elbows.</p> <p>Keep your body straight.</p>
 Abdomen/Back			<div data-bbox="1149 842 1352 1063"> <p>Place yourself on all fours. Make sure your arms are under your shoulders and knees under your hips.</p> </div> <div data-bbox="724 1063 1342 1192"> <p>Extend your legs horizontally one at a time. Add more challenge by extending horizontally your opposite hand at the same time with the leg. Keep your gaze pointing down so that neck maintains a good position</p> </div> <div data-bbox="1371 842 1651 1120">  </div> <div data-bbox="1671 842 1912 1135"> <p>Lay on your back on the floor, knees bent and hands next to the body. Contract your buttock muscles, push through your feet and raise your hips toward the ceiling.</p> </div> <div data-bbox="1371 1142 1700 1170"> <p>Do not overextend your back.</p> </div>

Balance exercises



Tandem stand:
Place your feet one in front of the other, heel to toe and in line. Hold for 20 seconds.

Tandem walk:
Imagine that there is a straight line drawn on the floor that you have to walk along. Try walking both forward and backward.



Stand upright with your feet shoulder- width apart. If needed, use support to maintain your balance. Look straight forward and lift your other leg into the air. Hold your supportive leg slightly bent.

Try to maintain your balance on one leg for 15 seconds and extend the time as your balance improves.



Stand up on your toes and the press your heels back down.

Support yourself if needed to keep your balance.

Keep your head up, looking forward when doing these exercises. Use a chair or bench for support, if needed.

Stretches



Lift your other arm up towards the ceiling and stretch your side by bending your hand and upper body to the opposite side.

Stretch for 20 seconds and switch sides.



Stand upright with your feet shoulder- width apart. Grasp your other ankle behind your back and pull your heel towards your buttocks. Try to keep your knee pointing towards the floor. Hold your supportive knee slightly bent.
Stretch for 20 seconds and switch sides.



Hold your hands together in front of you with fingers interlaced. Round your shoulders and back. Feel the stretch in your upper back. Then, unlock your fingers and with your thumbs pointing to the ceiling open your arms wide, squeezing your shoulder blades together to open up your chest.



Sit on the edge of a chair with your back straight. Put one leg forward with knee straight and ankle bent. Bend forward as far as possible, keeping your back straight. Do not over-extend your knee. Feel the stretch in the back of your leg.
Stretch for 20 seconds for both legs.

3 PRACTICAL HUR SOLUTIONS DURING THE PANDEMIC

THE ISSUE:

- Around the world Covid-19 pandemic has caused the same problem; people are instructed to avoid large groups. Especially if they belong to the risk groups.
- The immobilization itself is a major health problem.
- Large gym centrals can't serve the full (old-normal) capacity, due to restrictions. People may feel inconvenient if they are forced to the gyms.
- Exceptional circumstances require a new way of thinking and breaking the old way of doing things.

SOLUTION?

- Decentralized gym services.
- Data is still stored in the same place.
- HUR machines are spread around the facilities to small units.
- HUR machines requires less space than conventional gym machines.
- Machines are virtually silent, and therefore the machines can be located near the residents in the long-term care facilities.
- Small gym units can have specialized purposes i.e. falls prevention, cardio purposes, balance, Covid-19 rehab. etc.
- If you already have HUR gym, the machines are easy to relocate due to the lower weight compared to weight stack systems.



DECENTRALIZING AND MOVING ACTIVITIES AWAY FROM THE GYM





SAVING SPACE, FULL WORKOUT



HYGIENE ASPECTS



Cleaning products

HUR Moly Desinfection wipes and HUR Aloe Cleaning Wipes are tested to beat COVID- 19.



Screen

HUR Hi5 screen can be used with gloves that contain leather.



Automacy

Minimal touching on the frame and hardware.

Frames and handles

Easy to clean surfaces on the whole machine.

Upholstery

Easy to clean, non cellular material so does not absorb impurities. Relatively little seams that helps to keep the cushions clean.



