

Rehabilitation considerations during the COVID-19 outbreak

Coronavirus

www.paho.org/coronavirus

Noncommunicable Diseases and Mental Health

www.paho.org/nmh

Rehabilitation

<https://www.paho.org/en/topics/rehabilitation>

COVID-19

In March 2020 the World Health Organization (WHO) declared the outbreak of a novel coronavirus disease (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), to be a pandemic. Across the Region of the Americas all countries and territories have reported cases of COVID-19. WHO, PAHO and public health authorities around the world are taking action to contain the spread of COVID-19 and manage its impact. While most people develop mild or uncomplicated forms of COVID-19, it is estimated that approximately 14% are associated with severe acute respiratory infection (SARI) and may require hospitalization and oxygen support, and 5% require admission to an intensive care unit (ICU).¹ Early reports from China indicate median (IQR) ICU lengths of stay for patients admitted with COVID-19 of 8.0 (4.0–12.0)² and 8.0 (4.0–11.0)³ days.

Rehabilitation improves the health outcomes of patients with severe cases of COVID-19 and benefits health services through:

- **Optimizing health and functioning outcomes:** Rehabilitation may reduce complications associated with admission to an ICU, such as post intensive care syndrome (PICS);⁴ it aims to optimize a patient's recovery and reduce the experience of disability. Rehabilitation interventions can help address many consequences of severe COVID-19, including physical, cognitive, and swallow impairments, and provide psychosocial support. Older patients, and those with pre-existing health conditions, may be more vulnerable to the effects of severe illness, and rehabilitation can be particularly beneficial for maintaining their prior levels of independence.
- **Facilitating early discharge:** Where there is high demand for hospital beds, patients may need to be discharged more rapidly than ordinarily. Rehabilitation is particularly important in preparing patients for discharge, coordinating complex discharges, and in ensuring continuity of care.
- **Reducing the risk of readmission:** Rehabilitation helps to ensure patients do not deteriorate following discharge and require readmission, which is critical in the context of hospital bed shortages.

COVID-19

Rehabilitation professionalsⁱ are frontline health workers who should be engaged in the care of patients who experience severe cases of COVID-19. Patients who develop a severe case of COVID-19 will experience multiple phases of care. Rehabilitation should be included in all care phases: as part of the acute phase delivered in the intensive and critical care units; during the sub-acute phase delivered in a hospital ward or stepdown facility;ⁱⁱ and during the long-term phase such as when patients return home and are still recovering.

Rehabilitation professionals provide essential care for some non-COVID-19 patient groups. Evidence highlights that there may be risks to some individuals, and reduced health outcomes when rehabilitation is withdrawn or unavailable for some patient groups.⁵⁻⁹ Therefore rehabilitation services for these patient groups should be considered essential services and continue to be provided throughout the outbreak period.

Rehabilitation should be integrated into national COVID-19 emergency health planning, including within any deployed Emergency Medical Teams (EMTs). This should occur at the earliest opportunity and through engagement with rehabilitation experts and/or professional associations and national rehabilitation institutions. A practical mechanism for this is the inclusion of a focal rehabilitation representative in national and centre-based health management and coordination structures. Rehabilitation service planning should consider the needs of people affected by COVID-19 as well as priority non-COVID-19 patient groups.

The evidence for rehabilitation in the COVID-19 context is emerging, including guidance being developed by international and national professional associations of physiotherapy, occupational therapy, speech and language therapy and psychiatry for both clinical management of COVID-19 patients and for non-COVID related service delivery options.

-
- i Rehabilitation professionals potentially involved in the management of patients with severe cases of COVID-19 may include physical and rehabilitation medicine doctors, physiotherapists, respiratory therapists, speech and language pathologists, occupational therapists, and psychologists.
 - ii A stepdown facility is an inpatient facility established to increase the surge capacity of the hospital system by decompressing acute hospitals while avoiding premature discharges. Stepdown facilities provide interim, sub-acute care for medically stable patients, with rehabilitation strongly embedded. Stepdown facilities may be purpose built alongside Severe Acute Respiratory Infection (SARI) centres, or by converting existing health facilities (e.g., community hospitals, rehabilitation centres and nursing homes).

COVID-19

1

The role of rehabilitation in the management of patients with severe COVID-19

Key messages

Severe cases of COVID-19 are associated with rehabilitation needs related to the consequences of ventilatory support, and prolonged immobilization and bed rest. These may include:

- Impaired lung function;
- Physical deconditioning and muscle weakness;
- Delirium and other cognitive impairments;
- Impaired swallow and communication; and
- Mental health disorders and psychosocial support needs.

Rehabilitation needs may be amplified by underlying health conditions and decrements in health associated with ageing,

Rehabilitation professionals play an important role in facilitating early discharge, which is especially critical in the context of hospital bed shortages.

Rehabilitation needs of people with severe COVID-19 exist during the acute, sub-acute and long-term phases of care; rehabilitation professionals should be positioned in ICUs, hospital wards, stepdown facilities and in the community.

Particularly in the acute phase, rehabilitation interventions for patients with severe COVID-19 requiring ventilatory support generally require a particular skill-set acquired through specialist training.

COVID-19

1.1 Rehabilitation needs of patients with severe COVID-19

Patients with severe COVID-19 require hospitalization and oxygen support. Those whose illness may be complicated by acute respiratory distress syndrome (ARDS), sepsis and septic shock, or multi-organ failure, including kidney, liver and cardiac injury will typically require invasive mechanical ventilation in the ICU.^{1, 2, 10-12} As COVID-19 is a novel disease, the short- and long-term consequences for patients who have experienced severe disease requiring admission to the ICU are anticipated based on knowledge gained from the general critical care population, in particular those with ARDS. Mechanical ventilation, coupled with sedation and/or paralysis, as well as potentially prolonged bed rest and immobilization, can have many detrimental musculoskeletal effects¹³ including reduced muscle strength and physical function.^{14, 15} Other effects may include impairments in respiratory function, cognitive status, swallow, and communication, as well as the potential for delirium. In the long-term, the multifaceted aspects of post intensive care syndrome,⁴ which can persist for many months or years after discharge, may also manifest in reduced exercise capacity, independence with activities of daily living, and health-related quality of life.¹⁶⁻²⁸

Patients with severe COVID-19 who do not receive invasive mechanical ventilation, either because these resources are not available or where illness severity does not warrant this, may also experience some degree of impaired physical and respiratory function, as well as psychosocial challenges, as a result of the illness and hospitalization. The rehabilitation needs associated with severe COVID-19 may be amplified by underlying health conditions and older age. Isolation from support networks as a result of pandemic-related containment measures, may also exacerbate many of these problems for patients as they recover from COVID-19.

COVID-19

1.2 Rehabilitation interventions for patients with severe COVID-19

The role that rehabilitation professionals play in the management of patients with severe COVID-19, and how interventions are allocated across disciplines will vary by context. This guidance should therefore be interpreted and applied based on local role distribution and scopes of practice. Guidance for this table was compiled via inputs from global experts in the field of respiratory rehabilitation and review of relevant evidence in relation to COVID-19 and rehabilitation.

Phase of care	Rehabilitation interventions	Typical delivery setting
Acute	While patients with severe COVID-19 are receiving ventilatory support, rehabilitation professionals may be involved in supporting acute respiratory management ²⁹ , and the maintenance and improvement of functioning to facilitate early recovery. Specialized rehabilitation professionals can provide interventions that assist in improving oxygenation, airway secretion clearance, and ventilation weaning, ^{30,31} and can also play a role in promoting nutrition ³¹ and preventing aspiration pneumonia, especially post-intubation and/or in patients with a tracheostomy. ³³	Intensive and/or critical care units, high dependency units (including in SARI centres)
Sub-acute	In the early recovery period, once patients have returned to a hospital ward or stepdown facility, or for patients where illness severity did not warrant admission to an intensive care unit and who have been managed in a hospital ward, rehabilitation interventions may focus on addressing ongoing impairments in mobility, respiratory function, cognition, swallow and nutrition, and communication. ^{34,35} Interventions during this period further aim to promote independence with activities of daily living, and to provide psychosocial support. Rehabilitation professionals also contribute significantly to discharge preparation and planning, which can be particularly complex for older patients and those with comorbidities. ³⁶	Hospital wards, stepdown facilities (including in SARI centres)
Long-term	Following discharge, rehabilitation professionals can provide graded exercise, education on energy conservation and behaviour modification, home modification, and assistive products, as well as rehabilitation for any specific individual impairments. During the long-term recovery of severe COVID-19, patients may benefit from pulmonary rehabilitative interventions, which target physical and respiratory impairments, and include a combination of graded exercise, education, activity of daily living, and psychosocial support. ³⁷ In many contexts, pandemic related constraints (physical distancing, limited human resources and limited public transport) and infection risks mean that telehealth ⁱⁱⁱ is likely to be required following discharge. This could be extended to include remote exercise (e.g. “virtual group” education and exercise) and peer-to-peer support from COVID-19 patients who have received the appropriate training. Rehabilitation services located in people’s communities are often best placed to deliver longer-term care.	Rehabilitation centres, outpatient programmes, in-home services, mobile services, telehealth

iii Telehealth refers to the use of telecommunications and virtual technology to deliver health care, including rehabilitation, to patients.

COVID-19

2

Considerations for the continuity of rehabilitation for non-COVID-19 patients

Key messages

Rehabilitation needs of non-COVID-19 patients will continue during the outbreak. Some rehabilitation services are essential and will need to continue to operate throughout the course of the COVID-19 outbreak.

Lack of access to rehabilitation can compromise health outcomes, extend inpatient stays, and result in preventable hospital admissions due to health complications.

Decisions regarding the continuity of rehabilitation services need to consider the implications for different patient groups and for health service delivery more broadly, as well as infection risk to patients and rehabilitation professionals.

The COVID-19 outbreak and its impact on health systems mean that health planners need to make decisions on the extent to which rehabilitation services continue to operate and how rehabilitation service continuity can be maximized. These decisions need to reflect the risks associated with a cessation or reduction of services for different patient groups and for health service delivery. Infection risks must also be considered, along with local factors that impact the feasibility and appropriateness of alternative modes of service delivery, such as telehealth.

2.1 Infection risks for patients and rehabilitation professionals

As with other health services, face-to-face rehabilitation poses an infection risk that must be balanced against the risks to patient outcomes and health services associated with ceasing or reducing rehabilitation. Decisions regarding how rehabilitation services are delivered during the outbreak should aim to minimize exposure for patients – especially those at risk of experiencing severe COVID-19 due to age or underlying health

COVID-19

condition – and rehabilitation professionals. The degree of risk will depend on the availability of personal protective equipment (PPE) and other infection control measures, which may vary across service delivery settings. If service delivery is continued, services should follow WHO and PAHO guidance on infection prevention and control^{iv}. Decisions should also reflect the feasibility of alternative modes of rehabilitation service delivery, such as telehealth, which may be appropriate for some types of rehabilitation interventions, especially those based on education and advice. The feasibility of telehealth depends on local telecommunications infrastructure, the affordability of internet data for different socio-economic groups, among other local factors.

2.2 The impact of rehabilitation cessation or reduction on patient outcomes

Some rehabilitation services for non-COVID-19 patients should be identified as essential health services and continue during the COVID-19 outbreak. Evidence indicates that for some patient groups (e.g. burns, spinal cord injuries, stroke), cessation or reduction of rehabilitation can seriously compromise health and functioning outcomes and increase mortality.⁵⁻⁹ Patient groups that should continue to have access to rehabilitation throughout the course of the outbreak include those that have, or have recently had, significant injury (e.g. burns, spinal cord injury, traumatic brain injury, and fractures), major surgery, stroke or myocardial infarction. A more comprehensive list of patient groups is included in Section 4.5.

Where rehabilitation services are temporarily ceased, decreased or diverted, a prioritization of patients will be required that considers the risks associated with withdrawal of their care. Rehabilitation services should identify which patients are suitable for the following service options:

1. Discharge from rehabilitation with a comprehensive home programme and knowledge of potential complications or indications for follow-up.
2. Continuation of rehabilitation through inpatient, outpatient, home-based or telehealth services, often with modifications to rehabilitation practice (see Section 4.6).
3. Temporary cessation of their programme (often with an interim education and home programme) with an established, systematic method for follow-up after rehabilitation services are resumed (e.g. coded rehabilitation service database with up-to-date contact details).

iv Latest PAHO Technical Documents can be found here: <https://www.paho.org/en/technical-documents-coronavirus-disease-covid-19>

COVID-19

4. As the outbreak progresses over time, certain countries may be able to resume some rehabilitation services for patients with priority needs who have been cleared of COVID-19 or have recovered (such as in smaller rehabilitation facilities outside the main hospitals).

2.3 The impact of rehabilitation cessation or reduction on health service delivery

Efforts should be made to continue operating rehabilitation services that contribute to achieving safe and timely discharge from hospital, for patients both with and without COVID-19. These services can be essential in building the surge capacity of hospitals, which requires rapid movement of patients through the acute health-care system. Lack of access to rehabilitation can result in extended lengths of stay, and poorly planned or poorly coordinated rehabilitation can lead to preventable complications and readmissions. Availability of rehabilitation follow-up beyond the hospital setting can be a precondition to safe and timely discharge; therefore any decision-making regarding which rehabilitation services should continue to operate needs to consider services across both hospital and community settings. The patient groups most likely to require follow-up are those at risk of compromised outcomes, as described above, and are further detailed in Section 4.5.

During and following the COVID-19 outbreak, health services will encounter a shift in the profile of demand for rehabilitation services. For example, rehabilitation services associated with elective surgeries will reduce, and new rehabilitation service needs may arise due to exacerbations of underlying health conditions resulting from COVID-19 containment measures. Furthermore, ceasing or reducing some rehabilitation services during the outbreak will inevitably lead to a backlog of rehabilitation needs that will have to be addressed once containment measures begin to lift. These shifts in rehabilitation burden need to be factored into COVID-19 response and recovery plans.

COVID-19

3

Actions for national and subnational government

Key messages

With adjustments to delivery, rehabilitation can continue during the outbreak, including through telehealth.

Optimal recovery from severe cases of COVID-19 will require the expansion of stepdown facilities that provide rehabilitation. These facilities enable early discharge from acute settings where bed shortages occur.

There will be increased demand for rehabilitation professionals working in acute and critical care settings, and action is needed to ensure staffing requirements are met. There will also be increased demand for specialised longer-stay rehabilitation, especially for older people who will frequently require these services.

During their planning, government should work closely with rehabilitation agencies, including rehabilitation service providers, professional associations and rehabilitation professionals.

3.1 Include rehabilitation in COVID-19 health planning and make necessary adjustments to health financing

- Consider embedding a focal rehabilitation representative or rehabilitation focal point in health emergency management and coordination structures, such as Health Emergency Operation Centres.
- Consider rehabilitation planning in terms of both the rehabilitation needs of people affected by COVID-19 and the normative rehabilitation needs within the population.
- Include rehabilitation in decisions regarding which health services are essential and which are non-essential. These decisions must take into account the risks of withdrawing access to rehabilitation for different population groups, and the risk of infection to patients and rehabilitation professionals. Local factors should also be considered, such as feasibility of telehealth, rehabilitation workforce capacity and access to PPE.

COVID-19

- Integrate rehabilitation into the clinical guidance and protocols for people with COVID-19, including their acute, sub-acute and long-term care. Where appropriate, work with relevant professional associations.
- Plan and finance for an increased demand for rehabilitation services associated with COVID-19, especially for severe cases. Ensure that people with COVID-19 related rehabilitation needs, including for assistive products, do not encounter financial barriers to services.
- Anticipate a potential surge in the normative rehabilitation needs of the population once the COVID-19 restrictions ease and regular health service delivery resumes.

3.2 Increase the capacity of the rehabilitation workforce

- Work with facilities to coordinate the movement of the rehabilitation workforce across all levels of health services in order to achieve an optimal distribution of skills that will meet population needs.
- Work with rehabilitation agencies, such as professional associations, to facilitate rapid upskilling of rehabilitation professionals related to the care needs of COVID-19 patients, including physical, cognitive and psychosocial needs. It is essential that rehabilitation professionals work only within their scope of practice.
- Implement interim measures to expedite professional registration and/or licensure and insurance coverage for newly recruited and volunteer rehabilitation workforce. Reduce bureaucratic recruitment barriers while maintaining quality and safety mechanisms.
- Ensure that rehabilitation professionals have access to guidance or training on operating through telehealth services.

3.3 Support ongoing access to rehabilitation through maintaining select services, expand delivery of telehealth, and in-home services for non-COVID-19 patients

- Consider designating some health and rehabilitation facilities specifically for non-COVID-19 patients.
- Explore the potential for outsourcing some rehabilitation services to the private sector.
- Make the necessary administrative and financial adjustments to support delivery of rehabilitation through telehealth. Ensure that health financing mechanisms (e.g. insurance, rebates) include delivery of rehabilitation via telehealth; this may extend for a time-limited period in accordance with the duration of the outbreak. Where appropriate, allow rehabilitation personnel to work from outpatient, private clinics, or their homes to deliver telehealth.

COVID-19

- Where other service options are not available, support home-delivered rehabilitation when appropriate (considering infection risks) for patients who have underlying health conditions that put them at risk of developing severe cases of COVID-19, and where there are potential negative health outcomes if rehabilitation ceases and other service options, such as telehealth, are not appropriate or available.

3.4 Expand the capacity of stepdown facilities for COVID-19 patients, with embedded rehabilitation, to enable early discharge from acute settings in the context of bed shortages

- Identify suitable locations that can be rapidly converted into stepdown facilities for COVID-19 patients. If SARI centres are created, then integrate COVID-19 stepdown facilities into these centres. If this is not possible, then establish stepdown facilities close by for ease of transition.
- Ensure stepdown facilities are accessible, including lavatories and handwashing stations.
- Identify an appropriate composition of the workforce required to staff stepdown services.
- Identify the necessary rehabilitation equipment required by the patient groups accessing these services. If newly created, consider re-locating equipment from closed inpatient gym spaces, loaning from private practices or purchasing if necessary.
- Develop clear referral criteria and pathways and ensure effective communication between these.
- Ensure stepdown facilities have sufficient stock to provide the necessary assistive products that support functioning and accelerate discharge.
- Work closely with, and strengthen, community level services. This includes services that provide social support to enable patients to be cared for at home when safe to do so.

3.5 Explore potential offsite, satellite or mobile clinic locations, and mobile multidisciplinary teams to facilitate access to outpatient rehabilitation and follow-up in community settings for COVID-19 patients with ongoing rehabilitation needs

- Identify fit-for-purpose locations that are separate from acute care settings that may facilitate access to rehabilitation for patients in the community.
- Ensure that these locations have the necessary infrastructure and equipment for appropriate infection prevention and control, as well as for delivery of rehabilitation.

COVID-19

- Consider the development of new COVID-19 focused mobile and remote multidisciplinary teams that provide rehabilitation in community settings and support transitions for complex patients requiring additional supports – for example those adjusting to oxygen therapy at home.
- Consider establishing new, or expanding existing, pulmonary rehabilitation outpatient programmes.
- Develop clear referral criteria and pathways for these services and ensure that they are clearly communicated and supported with the necessary infrastructure and administrative capacity.

3.6 Prepare health, social and community care services for increased demand associated with the care needs of some people following severe cases of COVID-19 (especially among the older population)

- Some older people, people with disability, and people with co-morbidities may experience significant long-term rehabilitation, health and social care needs after experiencing severe COVID-19. These people may face challenges returning to their previous home/ community settings and requiring increased long-term care and support.
- Health, social and community care services (e.g. nongovernmental organizations and advocacy groups) that support older people and people with pre-existing health conditions, should work together to increase the capacity of care services for those affected by COVID-19.
- Work with health and social agencies to ensure access to assistive products for COVID-19 patients. Plan appropriately for increased demand, including through stockpiling.

COVID-19

4

Actions for service providers (e.g. hospitals, rehabilitation centres, private practices)

Key messages

Service providers should take steps to increase the surge capacity of their teams, particularly in the areas of critical care and stepdown.

Infection prevention and control measures, and access to PPE are essential for the continuation of rehabilitation services.

Service providers should undertake multiple actions if rehabilitation is reduced. This includes prioritizing patients for ongoing care, providing early supported discharge, and developing systematic follow-up mechanisms.

Modifications relating to how rehabilitation is delivered will be required for infection control, this may include changes to team structures, roles and means of communication.

4.1 Keep up to date with information relating to the outbreak status and all Regional and/or National guidelines regarding COVID-19

- Develop and maintain communication links with relevant national COVID-19 coordination bodies and local care coordination networks.
- Source, disseminate and enforce COVID-19 guidelines and protocols, including latest WHO and PAHO guidelines.
- Communicate frequently with patients, and disseminate pertinent information, especially to high-risk patient groups (i.e. those aged more than 70 years; those living with noncommunicable diseases and/or other immuno-suppressing conditions, or with reduced mobility and/or lung function).

COVID-19

In low-resource settings with high-density living, and where social distancing may be difficult (e.g. refugee camps), work with health services to promote practices that shield high-risk patients. This could include demarcating a room in a home specifically for high-risk members, or identifying an entire home to be used by high-risk members from neighbouring households.³⁸

4.2 Integrate rehabilitation into Infection Prevention and Control (IPC) measures and ensure workers use PPE appropriate to their risk exposure

- Define protocols for IPC, including to whom, when, and how they apply, and ensure these are reflective of level of risk. Keep in mind rehabilitation professionals engaged in delivery of potentially high-risk aerosol generating procedures (AGP) such as airway clearance, and the essential PPE required for this.
- Facilitate priority access to COVID-19 testing for rehabilitation workforce and household members.
- Ensure ready access to training on infection prevention control. Deliver face-to-face and online trainings, consider verification and quality control measures (see WHO training^v).
- Ensure there is an adequate supply of PPE for the rehabilitation workforce, including those working in outpatient departments and community settings.
- Establish clear guidance on when and how to engage rehabilitation professionals in the face-to-face care of patients with, and without, COVID-19.

4.3 Increase the surge capacity of the rehabilitation workforce and promote well-being

- Work with relevant government bodies and other health services to rapidly address workforce shortages, especially in the context of acute respiratory management, in accordance with anticipated case load.
- Consider sourcing rehabilitation professionals from retired workforce (these people must be in good health and not of a group at high-risk of contracting COVID-19), trainees, academics, private practice, rehabilitation professionals in vocational and educational services).
- Implement competency-based training, capacity-building and supervision for rehabilitation professionals who are rejoining the workforce or shifting their roles to provide surge support.

COVID-19

- Optimize productivity of existing workforce through measures such as postponing leave, modifying shift structures (such as to accommodate
- 24-hour coverage when needed), and increasing part-time contracts to full time.
- Identify high-risk health workforce members and define clear conditions for their practice.
- Support workforce well-being in the context of sustained intensive workload and high stress through:
 - Monitoring for and taking steps to prevent and burnout.
 - Ensuring access to psychosocial support.

4.4 Attain additional equipment needed for increased rehabilitation demand related to COVID-19 patients, including assistive products

- Attain medical equipment such as pulse oximeters and rehabilitation equipment such as hoists (where relevant), slide sheets, walking aids, feeding and nutrition aids, and equipment used during respiratory/ pulmonary rehabilitation, such as static bikes.
- Attain additional assistive products that will support early discharge such as walking frames, commode chairs, mattresses and transfer products.

4.5 Where rehabilitation services are temporarily ceased, decreased or diverted, undertake multiple actions for a supported discharge and prioritize rehabilitation patients for ongoing care and follow-up

- Adopt clear guidance that considers the clinical risks related to withdrawal of rehabilitation; identify the priority patients that should continue rehabilitation. Patient groups with clinical risks may include, but are not limited to:
 - Patients with new acute injuries, such as burns, spinal cord injuries, and musculoskeletal who may develop serious preventable complications.
 - Patients recovering from surgery.
 - Patients with conditions who are at risk of suboptimal recovery, such as those recovering from stroke or myocardial infarction or perinatal complications.
 - Patient requiring long-term rehabilitation in hospitals, residential centres or community settings who may experience a loss of function or develop complications.

COVID-19

- Patients who are unable to be discharged to a setting and be safe, or who may return to a setting that is a very long distance from the service and likely preclude them from future access.
- Where early supported discharge from a hospital setting or rehabilitation service must occur, ensure access to:
 - Maximum patient and caregiver education, self-management and home exercise programmes where it is safe and appropriate to do so.
 - Assistive products, adaptive equipment and guidance in their use.
 - Clear advice on complications as well as instructions on where to call (telephone numbers and hotlines), and when to call, if concerned.
 - Telehealth services which can include remote assessment and treatment via telephone or video link, where safe and appropriate to do so.
 - Individually prescribed standard treatment plans via e-mail, app, telehealth, or postal service where safe and appropriate to do so.
- In the event where rehabilitation must temporarily cease, develop systematic methods such as a databases for COVID-19 and non-COVID-19 patients requiring follow-up so that they can be tracked, and services arranged as soon as normal health service delivery resumes.

4.6 Adapt rehabilitation clinical management for COVID-19 patients

- Develop (based on best available evidence) or adopt (where national guidance has been established) clinical management guidelines and protocols of care related to COVID-19 patients.
- Develop adaptable rehabilitation resources for COVID-19 patients who experience ongoing respiratory and physical deconditioning. These resources may include home exercise programmes with graded exercises, pacing, behaviour modification, advice on positioning and recognizing red flags such as signs of medical deterioration.
- Develop systems for tracking COVID-19 patients and remote follow-up.
- Develop referral pathways and contact lists for services required by COVID-19 patients, this includes for potential stepdown care, mobile remote teams, community care and social support services.

4.7 Modify rehabilitation practices for infection control

- Develop and implement protocols for management of rehabilitation equipment and assistive products to minimize infection risks.
- Prepare rehabilitation providers for the impact of PPE on practice, such

COVID-19

as the time needed to don/doff protective wear, heat, and impact on patient rapport.

- Plan for working in different team groups/modular structures to reduce health worker client exposure.
- Prepare the workforce for infection control-based changes to care, which may require amending typical scope of practice and greater trans/interdisciplinary practice to reduce patients' contact with multiple professionals.
- Plan for multidisciplinary teamwork with less face-to-face contact (e.g. undertake meetings through virtual communication).
- Utilize telehealth as much as appropriate and possible; address barriers in the workplace such as technology, devices, network and costs.
- For inpatient settings, consider grouping/cohorting patient beds and optimizing their spacing to minimize the risk of infection.
- Attempt to confine rehabilitation sessions to within the person's bed space in order to restrict the movement of patients within an inpatient setting. Avoid use of shared therapy spaces such as gyms; implement restrictions in accordance with status of outbreak and associated risks.
- Develop/review and modify protocols for discharge to maximize acute bed availability and minimize patient time in a health facility.

4.8 Bolster access to psychosocial and community support services for patients

- Where raised levels of anxiety or depression may occur in COVID-19 patients and their families, ensure they access the psychosocial care and support they need during their rehabilitation process (refer to WHO guidance on mental health^{vi}).
- Identify when a patient's normal family or social support networks may have been disrupted due to the COVID-19 outbreak and facilitate access to support, including communication with family members. On discharge, consider that they may be further isolated; develop psychosocial support mechanisms and follow-up accordingly.
- Equip the rehabilitation workforce in psychological first aid skills, providing access to training and resources when needed.^{vii}
- Facilitate peer-to-peer support mechanisms (whether face-to-face or remotely) as much as possible while infection prevention and control measures are in place.

vi https://www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf?sfvrsn=6d3578af_2

vii https://www.who.int/mental_health/publications/guide_field_workers/en/

COVID-19

References

1. World Health Organization. Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected. Interim Guidance, v1.2. 2020;WHO reference number: WHO/2019-nCoV/clinical/2020.4
2. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *The Lancet* 2020;395(10229):1054-62. doi: 10.1016/S0140-6736(20)30566-3
3. Chen J, Fan H, Zhang L, et al. Retrospective analysis of clinical features in 101 death cases with COVID-19. *medRxiv* 2020; Published Ahead of Print:2020.03.09.20033068. doi: 10.1101/2020.03.09.20033068
4. Needham DM, Davidson J, Cohen H, et al. Improving long-term outcomes after discharge from intensive care unit: report from a stakeholders' conference. *Crit Care Med* 2012;40(2):502-09.
5. Puhan MA, Scharplatz M, Troosters T, et al. Respiratory rehabilitation after acute exacerbation of COPD may reduce risk for readmission and mortality – a systematic review. *Respiratory Research* 2005;6(1):54. doi: 10.1186/1465-9921-6-54
6. Robison J, Wiles R, Ellis-Hill C, et al. Resuming previously valued activities post-stroke: who or what helps? *Disabil Rehabil* 2009;31(19):1555-66. doi: 10.1080/09638280802639327
7. Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database of Systematic Reviews* 2012(9) doi: 10.1002/14651858.CD007146.pub3
8. Silow-Carroll S, Edwards J, Lashbrook A. Reducing hospital readmissions: lessons from top-performing hospitals. The Commonwealth Fund, April 2011.
9. Nas K, Yazmalar L, Sah V, et al. Rehabilitation of spinal cord injuries. *World Journal of Orthopedics* 2015;6(1):8-16.
10. ICNARC report on COVID-19 in critical care (27 March 2020). 2020; Intensive Care National Audit and Research Centre, London, UK
11. Guan W-j, Ni Z-y, Hu Y, et al. Clinical characteristics of coronavirus disease 2019 in China. *N Engl J Med* 2020; Published Ahead of Print doi: 10.1056/NEJMoa2002032
12. Yang X, Yu Y, Xu J, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *Lancet Respiratory Medicine* 2020; Published Ahead of Print doi: 10.1016/S2213-2600(20)30079-5
13. Brower RG. Consequences of bed rest. *Crit Care Med* 2009;37(10 Suppl):S422-8. doi: 10.1097/CCM.0b013e3181b6e30a 00003246-200910001-00019 [pii] [published Online First: 2010/02/06]
14. Parry SM, El-Ansary D, Cartwright MS, et al. Ultrasonography in the intensive care setting can be used to detect changes in the quality and quantity of muscle and is related to muscle strength and function. *J Crit Care* 2015;30(5):1151.e9-51.e14. doi: 10.1016/j.jcrc.2015.05.024

COVID-19

15. Gandotra S, Lovato J, Case D, et al. Physical function trajectories in survivors of acute respiratory failure. *Annals of the American Thoracic Society* 2019;16(4):471-77. doi: 10.1513/AnnalsATS.201806-375OC
16. Dinglas V, Friedman L, Colantuoni E, et al. Muscle weakness and 5-year survival in acute respiratory distress syndrome survivors.* *Critical Care Medicine*; March 2017;45(3):446-53.
17. Herridge MS, Tansey CM, Matté A, et al. Functional disability 5 years after acute respiratory distress syndrome. *N Engl J Med* 2011;364(14):1293-304. doi: doi:10.1056/NEJMoa1011802
18. Hopkins R, Suchyta M, Kamdar B, et al. Instrumental activities of daily living after critical illness: a systematic review. *Annals of the American Thoracic Society* 2017;14(8):1332-43. doi: 10.1513/AnnalsATS.201701-059SR
19. Hopkins RO, Weaver LK, Collingridge D, et al. Two-year cognitive, emotional, and quality-of-life outcomes in acute respiratory distress syndrome. *Am J Respir Crit Care Med* 2005;171(4):340-47. doi: 10.1164/rccm.200406-763OC
20. Huang M, Parker AM, Bienvenu OJ, et al. Psychiatric symptoms in acute respiratory distress syndrome survivors: a 1-year national multicenter study. *Crit Care Med* 2016;44(5):954-65. doi: 10.1097/ccm.0000000000001621
21. Pandharipande PP, Girard TD, Jackson JC, et al. Long-term cognitive impairment after critical illness. *N Engl J Med* 2013;369(14):1306-16. doi: doi:10.1056/NEJMoa1301372
22. Brodsky M, Huang M, Shanholtz C, et al. Recovery from dysphagia symptoms after oral endotracheal intubation in acute respiratory distress syndrome survivors. A 5-year longitudinal study. *Annals of the American Thoracic Society* 2017;14(3):376-83. doi: 10.1513/AnnalsATS.201606-455OC
23. Pfoh E, Wozniak A, Colantuoni E, et al. Physical declines occurring after hospital discharge in ARDS survivors: a 5-year longitudinal study. *Intensive Care Med* 2016;42(10):1557-66.
24. Cuthbertson B, Roughton S, Jenkinson D, et al. Quality of life in the five years after intensive care: a cohort study. *Critical Care* 2010;14(1):R6.
25. Needham DM, Feldman DR, Kho ME. The functional costs of ICU survivorship: collaborating to improve post-ICU disability. *Am J Respir Crit Care Med* 2011;183(8):962-64. doi: 10.1164/rccm.201012-2042ED
26. Oeyen SG, Vandijck DM, Benoit DD, et al. Quality of life after intensive care: a systematic review of the literature. *Crit Care Med* 2010;38(12):2386-400. doi: 10.1097/CCM.0b013e3181f3dec5 [published Online First: 2010/09/15]
27. Dijkstra-Kersten SMA, Kok L, Kerckhoffs MC, et al. Neuropsychiatric outcome in subgroups of Intensive Care Unit survivors: implications for after-care. *J Crit Care* 2020;55:171-76 (available at: <https://doi.org/10.1016/j.jcrc.2019.11.006>, accessed 8 April 2020).
28. Mikkelsen ME, Shull WH, Biester RC, et al. Cognitive, mood and quality of life impairments in a select population of ARDS survivors. *Respirology* 2009;14(1):76-82. doi: 10.1111/j.1440-1843.2008.01419.x

COVID-19

29. Thomas P, Baldwin C, Bissett B, et al. Physiotherapy management for COVID-19 in the acute hospital setting: clinical practice recommendations. *Journal of Physiotherapy* 2020; Published Ahead of Print doi: <https://doi.org/10.1016/j.jphys.2020.03.011>
30. Main E, Denehy L. Cardiorespiratory physiotherapy: adults and paediatrics: fifth edition. *Elsevier* 2016
31. Pathmanathan N, Beaumont N, Gratrix A. Respiratory physiotherapy in the critical care unit. *Continuing Education in Anaesthesia Critical Care & Pain* 2014;15(1):20-25. doi: 10.1093/bjaceaccp/mku005
32. Terblanche E. The role of dietitians in critical care. *Journal of the Intensive Care Society* 2019;20(3):255-57. doi: 10.1177/1751143718774715
33. McRae J, Montgomery E, Garstang Z, et al. The role of speech and language therapists in the intensive care unit. *Journal of the Intensive Care Society* 2019; Published Ahead of Print doi: 10.1177/1751143719875687
34. Held N, Moss M. Optimizing post-intensive care unit rehabilitation. *Turkish Thoracic Journal* 2019;20(2):147-52.
35. Griffiths RD, Jones C. Seven lessons from 20 years of follow-up of intensive care unit survivors. *Current Opinion in Critical Care* 2007;13(5):508-13. doi: 10.1097/MCC.0b013e3282efae05
36. Holm SE, Mu K. Discharge Planning for the elderly in acute care: the perceptions of experienced occupational therapists. *Physical & Occupational Therapy In Geriatrics* 2012;30(3):214-28. doi: 10.3109/02703181.2012.719601
37. Bolton CE, Bevan-Smith EF, Blakey JD, et al. British Thoracic Society guideline on pulmonary rehabilitation in adults: accredited by NICE. *Thorax* 2013;68(Suppl 2):ii1-ii30. doi: 10.1136/thoraxjnl-2013-203808
38. COVID-19 control in low-income settings and displaced populations: what can realistically be done? *London School of Hygiene and Tropical Medicine* 2020 (available at: <https://www.lshtm.ac.uk/newsevents/news/2020/covid-19-control-low-income-settings-and-displaced-populations-what-can>, accessed 8 April 2020).

COVID-19

Acknowledgments

We gratefully acknowledge the authors of this document: Pauline Kleinitz, Jody-Anne Mills (both WHO), Bronwen Connelly, Peter Skelton, Gaëlle Smith and Zoe Clift (all UKEMT)

We also gratefully acknowledge the contributions of the rehabilitation experts and WHO colleagues who reviewed and provided contributions to the document: Helen Barrett, Wouter DeGroute, Linda Denehy, Yasaman Etimadi, Rik Gosslink, Debbie Grey, Brooke Hallowell, Peter Lim, Elanie Marks, Satish Mishra, Larry Molt, Sheila Purves, Reuben Samuel, Vanessa Seijas Bermudez, Toby Smith, Alexandra Rauch, Cheryl Xavier, Mauro Zampolini.

The document was prepared for PAHO/WHO by Antony Duttine