



Irish Society of  
Chartered  
Physiotherapists  
The Voice of Physiotherapy in Ireland

## Guide

for treating adults with neurological conditions  
post COVID-19 in hospital, post-acute care and  
the community

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CPNG Guide for treating adults with neurological conditions post COVID-19 in hospital, post-acute care  
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## Introduction

COVID-19 emerged in China in December 2019. Due to the relatively short timeframe there is limited evidence available in relation to rehabilitation needs and no evidence detailing long-term outcomes for this patient cohort. The Chartered Physiotherapists in Respiratory Care (CPRC) recently published “Guide on Rehabilitation for treating patients with COVID-19 in hospital” which was endorsed by the Chartered Physiotherapists in Neurology and Gerontology (CPNG). This document is an evidence based outline and highlights the vital role of physiotherapy in the recovery process for adults with neurological conditions.

It is not yet known if adults with pre-existing neurological conditions are presenting any differently than other illness cohorts, when diagnosed with COVID-19. Herman et al (2020) have shown that approximately 8% of hospitalised patients with COVID-19 had a pre-existing neurological condition. Although emerging work suggests that co-existing conditions, such as hypertension, might increase the severity of COVID-19, conditions such as Multiple Sclerosis and the effects of COVID-19 on it remain relatively uncertain. An Italian study found 96% of patients with MS who were hospitalised with COVID-19 were categorised as mild, 2% as severe and 2% as critical (Sormani, 2020).

For COVID-19 patients with new onset neurological conditions, Mao et al (2020) found 36.4% of patients had neurological symptoms. Phillips et al (2020), having further investigated the evidence, highlight the more frequent complications in patients recovering from COVID-19. These include post intensive care syndrome, including critical illness polyneuropathy, critical illness myopathy and/or combination of these. As well as other neurological consequences of the virus and critical care, such as encephalopathy, cerebrovascular events and cerebral hypoxia, this will all have an impact on the rehabilitation needs of patients.

Adults with a pre-existing or new onset neurological condition can also experience significant functional decline after an acute event or hospital admission. Both adults with pre-existing or new onset neurological conditions, recovering following COVID-19, will

need a comprehensive, person-centred approach to the physiotherapy management and rehabilitation plan.

Therefore, the CPNG identified a need for a specific guide for the management of people with neurological conditions post COVID-19. This document focuses specifically on adults with neurological conditions and their recovery pathway post COVID-19. For the purpose of this document neurological conditions will be defined as disorders of the brain, spinal cord and nerves.

**Disclaimer:**

This guide has been developed for reference and guidance by the Irish Society of Chartered Physiotherapists' (ISCP) Clinical Interest Group in Neurology and Gerontology (CPNG). It is based on the available evidence on May 10th 2020. It is expected that all physiotherapists using this document will work within their scope of practice in line with local policies, procedures and guidelines.

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## Information common to all phases

- As this guide is focused on the physiotherapy management of adults who may have pre-existing neurological conditions; it is important to ascertain each patient's baseline function and impairments. This will aid in formulating goals and a person-centred rehabilitation plan. Use of the International Classification of Functioning, Disability and Health will be helpful.
- Physiotherapy management may include passive, active-assisted, active or resisted joint range of movement (ROM) exercises, bed mobility, sitting balance, sitting out of bed, sit to stand, walking, task specific training, tilt table, standing hoists, upper limb or lower limb ergometry, exercise programmes and neuromuscular electrical stimulation (Thomas et al. 2020).
- The use of equipment should be carefully considered and discussed with local infection control teams to ensure it can be properly decontaminated prior to being used with patients with COVID-19

## Considerations for likely pre-existing factors

- Physical Impairment - ICF Framework
- Sensory Issues -
  - Full Neurological Assessment in line with local policies
  - Postural Control and Balance
- Respiratory Issues - Baseline, Adjuncts
- Cognitive Impairment - Liaise with IDT re Cognitive Assessment
- Polypharmacy
- Continence
- Comorbidities

## Outcome Measurements

Consider using condition-specific, ICF Classification and participation related outcome measures. Listed below are examples of Outcome Measures which might be appropriate:

- Dynamometry
- 9 Hole Peg Test
- Scale for Assessment and Rating of Ataxia
- Dynamic Gait Index
- Timed Up & Go
- Berg Balance Scale
- Tinetti Test
- Mini-Best Test
- Fatigue Rating Scales



## Phase 1: Initial Presentation

Although this virus is known most commonly for its severe acute respiratory syndrome, Mao et al. (2020) show that some patients are developing neurological symptoms including headache, dizziness, disturbed level of consciousness, and paresthesia with more severely affected patients at increased risk of developing neurological symptoms. Research (Wu et al, 2020; Xiang et al 2020) also highlights further evidence of nervous system damage with Wu et al (2020) finding nervous system diseases such as Viral Encephalitis, Infectious Toxic Encephalopathy and Acute Cerebrovascular Disease related to COVID-19 infections. Herman et al (2020) found that approximately 8% of hospitalised patients with COVID-19 had a pre-existing neurological condition.

## Intensive Care Unit

- Rehabilitation should start early, ideally while the patient is still in the intensive care setting
- Growing evidence exists that early physiotherapy interventions (mobilisation and stimulation of activities) in critically ill intensive care patients may influence or even prevent physical impairments (Sommers et al 2015)
- ICU survivors with ICU-acquired weakness also experience significant long-term impairment in respiratory muscle strength, physical functioning, and quality of life, lasting for months and years after hospital discharge (Hashem et al, 2016)
- Early mobilisation and rehabilitation of critically ill patients may play an important role in preventing the effects of bed rest and prolonged ICU stays.
- From a neurological point of view, patients with respiratory insufficiency from neuromuscular disease or musculoskeletal limitations such as kyphoscoliosis are likely to be at higher risk in severe COVID-19 infection.
- Patients with <60% predicted Forced Vital Capacity (FVC) are unlikely to wean from ventilation and patients with <40% FVC are likely to already be on Non-Invasive Positive Pressure Ventilation (Manji et al, 2020).



- For patients with neurological conditions requiring respiratory techniques such as Manual Cough Assist, Breath Stacking or Mechanical Insufflation-Exsufflation, please refer to *Guidelines for the Physiotherapy Management of Motor Neuron Disease* when considering use of adjuncts for patients with neuro-respiratory needs.
- The use of such equipment/adjuncts should be carefully considered and discussed with local infection control teams to ensure it can be properly decontaminated prior to being used with patients with COVID-19. While also considering the use of appropriate Personal Protective Equipment (PPE) during Aerosol Generating Procedures (AGPs), please refer to the international guidelines contained in: [\*Physiotherapy Management for COVID-19 in the Acute Hospital Setting.\*](#)

## Phase 2: Ward based management

Neurological patients, along with many other patient cohorts, post COVID-19, may present with a wide range of problems due to cardio-pulmonary, musculoskeletal, neurological and psychological/psychiatric complications of the COVID-19 infection, compounded in many cases by deconditioning from prolonged stays in ICU (Phillips et al 2020).

On discharge from intensive care, physiotherapists working within the acute rehabilitation setting can provide early intervention (looking at joint range of motion, strengthening, exercise prescription) and advice regarding return to daily living, physical activity and exercise. The physiotherapist, in collaboration with the patient, multidisciplinary team, carers and family, should plan the most suitable pathway for discharge and further rehabilitation if indicated.

Rehabilitation should be highlighted and commenced as soon as possible for patients with neurological presentations, who may fall into the cohort of more complex rehabilitation needs or a slower trajectory towards recovery.

Fatigue is present in 40% of cases and this should be taken into account in rehabilitation (Wang et al, 2020). It is also commonplace in many neurological conditions such as Stroke, Motor Neuron Disease, Multiple Sclerosis and Parkinson's disease (Hinkle et al 2017; Kluger et al, 2016; Gibbons et al, 2013; Braley et al, 2010).

As fatigue appears to be a common feature both in COVID-19 and neurological conditions, fatigue management and education will play a role in all stages of rehabilitation. It is also important that physiotherapists have an understanding and knowledge of complications of viral infections such as Post-Viral Fatigue Syndrome (PVFS). Please see <https://www.physiosforme.com/covid-19> for further information on recognising and managing PVFS.

### Discharge Planning from Hospital Care

Before hospital discharge patients should receive verbal information from the MDT regarding their experience in hospital, as well as physical and psychological symptoms

that may be experienced later, explanation of causes of these symptoms, and MDT recommendations to enhance rehabilitation and recovery (British Psychological Society, 2020). Any follow-up of care, such as transfer to an offsite rehabilitation facility or community physiotherapy services, should be discussed and agreed with the patient as well as the MDT. The referring physiotherapist, where possible, should liaise with onward services to optimise follow up physiotherapy management for patients.

The ISCP CPRC Patient Information Leaflet “*Physiotherapy Advice for Patients with COVID-19 after Discharge from Hospital*”, which is endorsed by the CPNG, can also be given to patients at this stage.

## Phase 3: Post-Acute Phase

### Rehabilitation Needs in the Community

COVID-19 is a multi-systemic condition and some of the effects are long lasting. Experience from China and Italy suggests that at least one third of patients discharged from hospital require assistance in ADL's and a similar proportion have significant neurological sequelae (Mao et al. 2020). Therefore, there may be an increase in the number of patients presenting with neurological conditions in the community post hospital discharge. In order to regain full function, those recovering from COVID-19 but still suffering from respiratory dysfunction or muscle weakness after discharge from hospital should continue physiotherapy at home, supervised by an experienced physiotherapist

Community neurological rehabilitation services need to continue throughout the pandemic where possible. Rehabilitation services are essential to maintaining functional independence and wellbeing as well as keeping people out of hospital. Lack of rehabilitation may cause long term deterioration and impact on a person's ability to live independently in the community. It may also lead to secondary issues such as falls.

### Considerations for rehabilitation in the community

Patients should have an individualised assessment in order to document immediate needs including muscle strength, mobility, balance, symptom control, dyspnoea, fatigue, pain, need for supplemental oxygen, adequate nutrition, sufficient psychological/social support and short/medium term needs including improved physical and emotional functioning, return to work (NICE 2017, Spruit et al, 2020). Based on the functional assessment, the physiotherapist should create and agree rehabilitation goals with the patient. With the patient's consent, the family/caregiver should be involved in goal-setting.

As with the critical care cohort, early mobilisation is encouraged. Early mobilisation reduces length of stay in adults hospitalised with pneumonia (Larsen et al 2019) and an

8-day period of in-patient rehabilitation improves functional capacity, peripheral muscle strength and quality of life in patients with community-acquired pneumonia (Jose & Dal Corso, 2016). Patients can be initially encouraged to sit out of bed (Mundy et al, 2003) and perform simple activities of daily living. The ISCP-CPRC Patient Information Leaflet “*Exercise Advice in Isolation*” can act as a guide for intervention at this stage. Mobilisation and exercise prescription should involve careful consideration of the patient's state e.g. stable clinical presentation with stable respiratory and haemodynamic function (Thomas et al 2020). Exercise is likely to be needed by all patients to overcome deconditioning, to improve pulmonary function and address any neuromuscular complications. The practice of functional activities will re-establish patients' autonomy in important and meaningful tasks. Providing education and information is an important aspect of patient care. Making full use of technology may assist in the rehabilitation and educational needs of our patients (Barsom et al 2020).

Providing information to patients and carers about voluntary organisations such as the Parkinson's Association Ireland [Parkinson's Association of Ireland](#), MS Society [MS Ireland](#); Irish Heart [Irish Heart](#), may offer further support networks and links within the community setting. Some patients may require equipment or adaptations, even on a short term basis, therefore assessment with multidisciplinary colleagues or onward referral to appropriate services may be required

## Conclusion

Adults with pre-existing neurological conditions exposed to COVID-19 may have a complex recovery and rehabilitation journey. Those with pre-existing neurological conditions who have been stringently following cocooning advice may experience functional deterioration during the prolonged pandemic. In addition, some adults affected by COVID-19 have residual neurological impairment as result of the virus. Physiotherapists have a critical role with each cohort in the prevention or delay of functional decline, rehabilitation and recovery of independence and social reintegration post-cocooning. Integrated working with multidisciplinary teams across all outlets of care will ensure optimal patient outcome. The limitations of social distancing, infection control measures and reduced “face-to-face” contact will require physiotherapists to modify their approach and interventions within these restrictions. This document should be read in conjunction with local policies and guidelines in relation to infection control and patient care.

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