# A rapid systematic review to establish what rehabilitation may enable recovery from COVID-19

# Study protocol

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**Authors**

Vicki Goodwin[1]

Louise Allan[1]

Alison Bethel[1]

Rachel Botell[3]

Alison Cowley[2]

Jane Cross[4]

Jo Day[1]

Avril Drummond[2]

Jo Thompson Coon[1]

Sallie Lamb[1]

[1] *University of Exeter*

[2] *University of Nottingham*

[3] *Royal Devon and Exeter NHS Foundation Trust*

[4] *University of East Anglia*

Corresponding Author: Professor Vicki Goodwin, University of Exeter Medical School, 2.05D South Cloisters, St Luke's Campus, Magdalen Rad, Exeter EX1 2LU, UK

v.goodwin@exeter.ac.uk

**Introduction:**

People who survive COVID-19 may have experienced a spectrum of disease presentations, typically involving a fever and a persistent cough. Approximately 81% of those with confirmed COVID-19 have mild to moderate disease presentation, 14% have a more severe form, and 5% experience respiratory failure which is deemed 'critical' [1]. However, it would also seem that older people are presenting differently from the rest of the population, with fever and breathlessness much less common and with delirium, lethargy, falls and a loss of appetite as the most frequently reported atypical manifestations [2].

In some countries, including the UK, the use of ventilation may be restricted to those without comorbidity or frailty when need outstrips demand as this group are most likely to benefit from this level of care [3]. As such, those who are older and have pre-existing conditions are unlikely to receive the most intensive interventions. Wherever those with COVID-19 are being managed, be it in hospital or in the community, there is limited empirical data currently available on the resulting impairments they have. Those recovering from severe non-COVID respiratory infections, such as Adult Respiratory Distress Syndrome (ARDS), are reported to have notable impairments of lung, neuromuscular, physical, psychological and cognitive function, as well as reduced quality of life [4-10] and we would anticipate similar issues for with those recovering from COVID-19. In addition, both younger and older people have long lasting functional disability following an intensive care admission [10] with associated increased health care use and costs [11]. However, anecdotal reports from clinicians suggest excessive fatigue, muscle weakness, breathlessness, cognitive impairment and frailty are the most commonly reported issues affecting COVID-19 survivors of all ages whether they require ventilation, hospitalisation or remain in their own homes. Such signs and symptoms are likely to have substantial consequences, particularly for older people and those with pre-existing conditions or frailty who survive [12]. It is therefore important to consider the rehabilitation needs of all those who have residual problems due to COVID-19.

Physical rehabilitation, in hospital and in the community has a vital role in the recovery of those surviving COVID-19. There is no existing COVID evidence to support rehabilitation interventions that will be effective in people's recovery. Thus, it is important to develop practice guidelines drawn upon on populations that have been extensively investigated in previous rehabilitation studies who display similar impairments to those anticipated in people with COVID-19. This rapid review will therefore consider the evidence for rehabilitation strategies for patients with respiratory illness that leave critical care with residual impairments.

**Aims and Objectives:**

Our aim is to produce a pragmatic summary of the relevant evidence for rehabilitation which is likely applicable to adults recovering from COVID-19. Our primary objective is to establish:

- What rehabilitation interventions could improve functional ability and quality of life for adults recovering from COVID-19?

Our secondary objectives are to establish:

- What rehabilitations interventions could improve functional ability and quality of life in older people (age 65+) and people with pre-existing conditions or frailty recovering from COVID-19?
- The views and experiences of those undergoing such rehabilitation.

- What COVID-19-related circumstances and context would need to be considered when implementing interventions into practice?

**Methods**

A rapid review with stakeholder and expert engagement will be undertaken to address the study aims and objectives. The protocol was developed in conjunction with national UK experts in rehabilitation and will be registered on Open Science Framework. We will follow Cochrane guidance for rapid reviews [13].

**Identification of studies**

The search strategy was developed in consultation with topic and methodological experts using a combination of controlled vocabulary (eg MeSH) and free text terms. Seven bibliographic databases will be searched, Medline (via OvidSP), CINAHL Complete (via EBSCOhost), Cochrane Library, CDSR and CENTRAL (via Wiley), Epistemonikos (via Epistemonikos.org), PEDro (via pedro.org.au) and OTseeker (via otseeker.com). Study type filters will be applied to the stepwise searches. English language papers only will be identified.

***Inclusion and exclusion criteria***

As this is a new disease, there is no current research regarding the effectiveness of rehabilitation following COVID-19. We will therefore examine rehabilitation interventions for other respiratory conditions including influenza, pneumonia, Adult Respiratory Distress Syndrome (ARDS), Severe Adult Respiratory Syndrome (SARS), and Middle East Respiratory Syndrome (MERS) that require intensive or critical care for which there are symptom parallels.

*Population*

Included: Adults (aged 18 and over) with respiratory conditions requiring intensive or critical care.

Excluded: those receiving palliative care; children.

*Setting*

Included: any care setting including inpatient, outpatient, home-based, community-based or residential care

Excluded: hospices

*Intervention(s)*

Included: Rehabilitation that aims to enhance and restore functional ability and quality of life to those with physical impairments or disabilities. This may include behavioural or physical interventions.

Excluded: cognitive rehabilitation; respiratory-focussed interventions such as chest physiotherapy.

*Comparator(s)*

No exclusions

*Outcomes*

Included: Impairments, functional ability, participation, quality of life; Experiences or views of adults

Excluded: Experiences and views of staff

*Types of study*

Included: Systematic reviews of randomised controlled trials or qualitative studies; Randomised controlled trials that have not been included in the reviews; Qualitative studies that have not be included in the reviews

Excluded: conference abstracts, opinion papers, non-systematic reviews, non-randomised trials.

**Searching and screening**

We will use a stepwise approach to search for then identify included studies based on study type.

Firstly, we will identify systematic reviews. Pilot screening of a random sample of 30 titles and abstracts will be completed by the review team. Decisions will be discussed to ensure consistent application of criteria. Where necessary inclusion and exclusion criteria will be revised to reflect reviewer interpretation and judgements.

Twenty five percent of titles and abstracts will be dual screened, with disagreements resolved between the two reviewers. Of the remaining abstracts, one reviewer will screen all and a second reviewer will screen all excluded abstracts. Pilot screening of five full text papers will be undertaken by the review team. One reviewer will screen all full texts and a second reviewer will screen all excluded full text papers. Resolution will be sought with a third reviewer where necessary.

Included reviews will be checked for the RCTs and primary qualitative studies they included and these will be added to a Master list.

Secondly, a search for RCTs, will be run and those already included in the Master list removed. Twenty five percent of titles and abstracts will be dual screened, with disagreements resolved between the two reviewers. Of the remaining abstracts, one reviewer will screen all and a second reviewer will screen all excluded abstracts. Pilot screening of five full text papers will be undertaken by the review team. One reviewer will screen all full texts and a second reviewer will screen all excluded full text papers. Resolution will be sought with a third reviewer where necessary. Included RCTs will be added to the Master list.

The same process used for RCTs will be followed to identify additional primary qualitative studies.

Reviewers will be paired with each pairing having someone with a clinical background. Endnote will be used to support study selection.

***Data extraction***

Data will be extracted by one reviewer using a piloted form and checked for accuracy by a second reviewer. Data will be extracted based on a minimal dataset. Where possible, existing data from systematic reviews will be utilised.

Focussed data extraction will include:

- Study population (condition, country, setting)

- Sample characteristics including age, comorbidities
- Intervention descriptor including what provided (including adjunct interventions such as oxygen therapy and discharge planning), who provided, how delivered, where delivered, when delivered and how much [14]
- Outcomes:
    - Individual (impairments, activities and participation, quality of life, experiences, safety)
    - Service (length of stay, discharge destination)
- Study findings in relation to the individual and service outcomes; influential contextual factors

**Quality assessment**

Study quality will be established using the relevant CASP quality appraisal tool. One reviewer will extract relevant data with a second reviewer checking. Risk of bias ratings will be limited to the most important outcomes.

**Strategy for data synthesis**

A narrative synthesis will be undertaken for both the quantitative and qualitative studies involving (a) all adults, and (b) older adults and those pre-existing conditions or frailty. Analysis will be synthesised by setting*:* Intensive care; step-down hospital care; community care. A single reviewer will grade the certainty of evidence with verification by a second reviewer.

**Logic Model**

A logic model will be developed iteratively to provide a framework to understand the elements, mechanisms and influential circumstances for rehabilitation to support recovery of from COVID-19 within the current clinical context. This process will include clinical stakeholder engagement activities and targeted supplementary searches where indicated.

**Clinical Stakeholder Engagement**

In order to ensure that we understand the current issues facing rehabilitation professionals and that our findings and outputs are relevant we will undertake a range of stakeholder engagement activities.

A multidisciplinary expert panel has been established comprising topic experts in rehabilitation. They have contributed to the development of the protocol and search strategy and will have ongoing involvement in all activities to support the review and development of outputs and dissemination materials.

Stakeholder engagement will be facilitated through tweetchats hosted through @physiotalk and/or @OTalk on rehabilitation after COVID. @physiotalk is an online international discussion group open to all (not just physiotherapists) that takes place on a Monday 8pm (GMT) for an hour every two weeks with a transcript available online afterwards. At the start of the COVID, they made these groups weekly and responsive to current COVID-related topics. They have previously held sessions on Personal Protective Equipment (PPE) and on respiratory care. The transcript of the online discussions will be

used to identify contextual and current practice issues relating to rehabilitation for those recovering from COVID-19.

**Dissemination**

A set of evidence-based clinical practice recommendations will be produced based on setting and, where relevant, recommendations specific to older people or those with pre-existing conditions or frailty will be included. Visual materials and lay summaries will be developed to share key messages. In addition, academic peer reviewed publications and conference abstracts will be submitted.

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