



The following information resources have been selected by the National Health Library and Knowledge Service Evidence Virtual Team in response to your question. The resources are listed in our estimated order of relevance to practicing healthcare professionals confronted with this scenario in an Irish context. In respect of the evolving global situation and rapidly changing evidence base, it is advised to use hyperlinked sources in this document to ensure that the information you are disseminating to the public or applying in clinical practice is the most current, valid and accurate. For further information on the methodology used in the compilation of this document—including a complete list of sources consulted—please see our [National Health Library and Knowledge Service Summary of Evidence Protocol](#).

## What is the psychological impact of COVID-19 on patients recovering from the disease who need rehabilitation?

### IN A NUTSHELL

There is limited data on the psychological impact of COVID-19 on patients recovering from the disease<sup>2</sup>. Available studies so far list reduced sleep quality, depression, anxiety and post-traumatic stress disorder (PTSD) as the main symptoms<sup>1,3-12</sup>.

Evidence from previous SARS and MERS epidemics support this pattern<sup>20-26</sup>, as do studies looking at survivors of critical illness<sup>27-31</sup>. Follow-up data in these patient groups reported symptoms of anxiety, depression, and PTSD ranging from 15% to 44%<sup>17</sup>. One recent multi-centre Chinese study found self-reported PTSD symptoms in 96% of recovered COVID-19 patients<sup>3</sup>. Data from the SARS outbreak show that stress and other psychiatric symptoms persisted long term<sup>21,22</sup>.

In COVID-19, a small number of randomised controlled trials have been undertaken on: an internet-based intervention for depression and anxiety<sup>10</sup>; progressive muscle relaxation for anxiety and sleep quality<sup>8</sup>; and effects of respiratory rehabilitation on psychological function in elderly patients<sup>9</sup>. These studies showed positive results but patient numbers were small and benefits were mild.

Surveillance for psychopathology will be important in the recovery and rehabilitation phases. Recommendations are to anticipate a high prevalence of depression, anxiety, and PTSD symptoms, and to provide comprehensive and timely management. Particular consideration is required for those with pre-morbid psychiatric illness, healthcare workers<sup>13</sup>, and those who have been treated in Intensive Care.



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## INTERNATIONAL GUIDANCE

### What does the World Health Organization say?

#### [World Health Organization \(2020\) Clinical management of COVID 19: interim guidance 27 May 2020<sup>1</sup>](#)

See section 15. Management of neurological and mental manifestations associated with COVID 19.

Anxiety and depressive symptoms may constitute common reactions for people in the context of COVID-19 diagnosis, especially for those who may be hospitalized, due to concerns for one's own health or the health of others, the need for physical isolation (which can lead to social isolation), potential risk of death, concerns over the risk of infecting others, and concerns over leaving family members alone who may need care. Stressors particular to COVID-19 include: fear of falling ill and dying, fear of being socially excluded/placed in quarantine, loss of livelihood and loss of loved ones, and feelings of helplessness, boredom and loneliness due to being isolated. These stressors may trigger new symptoms or exacerbate underlying mental or neurological conditions. Patients with pre-existing mental health conditions and substance abuse disorders may also be adversely impacted. People with COVID-19 are at higher risk for sleep problems owing to acute stress responses, as well as additional reasons for those who are hospitalized such as environmental factors, invasive medical procedures (e.g. mechanical ventilation) and the frequent combination of multiple medications possibly disrupting sleep patterns.



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## POINT-OF-CARE TOOLS

### What does UpToDate say?

#### [UpToDate \(2020\) Coronavirus disease 2019 \(COVID-19\): Psychiatric illness<sup>2</sup>](#)

See section: Course of illness.

Few data are available regarding the occurrence of psychiatric illness in COVID-19 patients, but studies of other coronavirus epidemics suggest many hospitalized patients will have persistent psychiatric disorders. In a meta-analysis of patients who were hospitalized for severe acute respiratory syndrome or Middle East respiratory syndrome and assessed 3 to 46 months after recovery, the point prevalence of anxiety disorders, depressive disorders, and posttraumatic stress disorder was 15, 15, and 32 percent, respectively. For patients with COVID-19, unpublished data from one small study showed delirium and agitation in two-thirds of intensive care unit patients, and one-third had a dysexecutive syndrome at discharge. For patients who are discharged from the hospital following recovery from COVID-19, surveillance for psychopathology will likely be important.

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## INTERNATIONAL LITERATURE

### What does the international literature say?

#### [Bo et al \(2020\) Posttraumatic Stress Symptoms and Attitude Toward Crisis Mental Health Services Among Clinically Stable Patients With COVID-19 in China<sup>3</sup>](#)

This study found that most clinically stable COVID-19 patients suffered from significant posttraumatic stress symptoms associated with the COVID-19 prior to discharge. Considering the negative detrimental impact of significant posttraumatic stress symptoms, appropriate crisis psychological interventions and long-term follow-up assessments should be urgently initiated for COVID-19 survivors.



## **Boyratz and Legros (2020) Coronavirus Disease (COVID-19) and Traumatic Stress: Probable Risk Factors and Correlates of Posttraumatic Stress Disorder<sup>4</sup>**

The Coronavirus Disease (COVID-19) outbreak, which first began in December 2019 in China, has since become a global health crisis with vast and devastating consequences for individuals and societies. Both earlier research and recent findings suggest that infectious disease epidemics and pandemics can be highly traumatic experiences for some individuals and lead to posttraumatic stress disorder (PTSD) and chronic psychological distress. Mental health risks associated with COVID-19 have yet to be systematically studied; however, the emerging literature on COVID-19, as well as previous studies on infectious disease outbreaks provide insights into probable risk factors and correlates of PTSD. In this paper, we provide a brief review of these studies and discuss probable risk factors for PTSD and chronic psychological distress related to COVID-19.

## **Yuan et al (2020) Correlation Between Immune Response and Self-Reported Depression During Convalescence From COVID-19<sup>5</sup>**

Self-reported depression has been observed in coronavirus disease-2019 (COVID-19) patients, infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), during discharge from the hospital. However, the cause of this self-reported depression during the convalescent period remains unclear. Here, we report the mental health status of 96 convalescent COVID-19 patients who were surveyed using an online questionnaire at the Shenzhen Samii Medical Center from March 2 to March 12, 2020 in Shenzhen, China. After obtaining their informed consent, we retrospectively analysed the clinical characteristics of patients, including routine blood and biochemical data. The results suggested that patients with self-reported depression exhibited increased immune response, as indicated by increased white blood cell and neutrophil counts, as well as neutrophil-to-lymphocyte ratio. However, the mechanism linking self-reported depression to these cellular changes needs further study. In conclusion, self-reported depression occurred at an early stage in convalescent COVID-19 patients, and changes in immune function were apparent during short-term follow-up of these patients after discharge. Appropriate psychological interventions are necessary, and changes in immune function should be emphasized during long-term follow up of these patients.

## [Yang et al \(2020\) \[Preprint – not peer reviewed\] Analysis of psychological state and clinical psychological intervention model of patients with COVID-19<sup>6</sup>](#)

**Background:** Patients with the 2019 coronavirus disease (COVID-19) have different degrees of psychological pain, such as anxiety and depression, which may be related to their prognosis. Psychological intervention can be conducted in different ways to improve psychological pain and improve the treatment effect.

**Objective:** The present study aimed to investigate and analyse the psychological status of patients with COVID-19 during the course of illness, and to evaluate the effect and influencing factors of psychological crisis intervention, so as to explore the effective mode of clinical psychological intervention in acute patients under isolation environment.

**Methods:** A total of 143 persons participated in the study, including 26 patients diagnosed with COVID-19 in the isolation ward (COVID-19 group), 87 patients with general pneumonia in the observation ward (General Pneumonia group) and 30 healthy volunteers (Normal group). All the patients in the ward received comprehensive psychological intervention, including telephone psychological counselling (active and passive), self-adjustment of written materials and one-to-one psychological crisis intervention. Hamilton depression scale (HAMD) and Hamilton anxiety scale (HAMA) were used to evaluate the mental health status of all patients on the day of admission and 1 week after treatment.

**Results:** The scores of HAMA and HAMD of all patients (including isolation ward and observation ward) were significantly higher than the healthy volunteers at the time of admission. The total score of HAMA and HAMD in COVID-19 group were both higher than that General Pneumonia group. After 1 week's hospitalization with comprehensive psychological intervention, the scores of HAMA and HAMD in COVID-19 group were significantly decreased.

**Conclusion:** Patients those who diagnosed with COVID-19 in the isolation ward and/or general pneumonia in observation ward have different degrees of anxiety, depression and sleep problems. While receiving antiviral treatment, patients also need psychological intervention. Comprehensive psychological intervention model has been proved to be effective.



## [Ahmed et al \(2020\) \[Preprint – not peer reviewed\] Long-Term clinical outcomes in survivors of coronavirus outbreaks after hospitalisation or ICU admission: A systematic review and meta-analysis of follow-up studies<sup>7</sup>](#)

**Objective:** To determine the long-term clinical problems in adult survivors of coronavirus (CoV) infection [Coronavirus disease 2019 (COVID-19), Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS)] after hospitalisation or Intensive Care Unit (ICU) admission.

**Design:** Systematic review and meta-analysis of the literature. Data sources: Ovid MEDLINE, EMBASE, CINAHL Plus and PsycINFO were searched using the strategy: (Coronavirus OR Coronavirus Infections OR COVID OR SARS virus OR Severe acute respiratory syndrome OR MERS OR Middle east respiratory syndrome) AND (Follow-up OR Follow-up studies OR Prevalence). Original studies reporting the clinical outcomes of adult survivors of coronavirus outbreaks two months after discharge or three months after admission were included. The quality of the studies was assessed using the Oxford Centre for Evidence-Based Medicine (OCEBM) 2009 Level of Evidence Tool. Meta-analysis was conducted to derive pooled estimates of prevalence and severity for different outcomes at time points up to 6 months' follow-up and beyond 6 months' follow-up.

**Results:** The search yielded 1169 studies of which 28 were included in this review. There were 15 Level 1b, 8 Level 2b, 2 Level 3b and 3 Level 4 studies by OCEBM grading. Pooled analysis of studies revealed that complications commonly observed were impaired diffusing capacity for carbon monoxide (DLCO) [prevalence of 27.26%, 95% CI 14.87 to 44.57] and reduced exercise capacity [(6-minute walking distance (6MWD) mean 461m, 95% CI 449.66 to 472.71] at 6 months with limited improvement beyond 6 months. Coronavirus survivors had considerable prevalence of psychological disorders such as post-traumatic stress disorder (PTSD) [38.80%, CI 30.93 to 47.31], depression [33.20%, CI 19.80 to 50.02] and anxiety [30.04%, CI 10.44 to 61.26] beyond 6 months. These complications were accompanied by low Short Form 36 (SF-36) scores at 6 months and beyond indicating reduced quality of life which is present long-term.

**Conclusions:** The long term clinical problems in survivors of CoV infections (SARS and MERS) after hospitalisation or Intensive Care Unit (ICU) admission include respiratory dysfunction, reduced exercise capacity, psychological problems such as PTSD, depression and anxiety, and reduced quality of life. Critical care, rehabilitation and mental health services should anticipate a



high prevalence of these problems following COVID-19 and ensure their adequate and timely management with the aim of restoring pre-morbid quality of life.

### [Liu et al \(2020\) Effects of Progressive Muscle Relaxation on Anxiety and Sleep Quality in Patients With COVID-19<sup>8</sup>](#)

**Background:** Patients with Coronavirus Disease 2019 (COVID-19) will experience high levels of anxiety and low sleep quality due to isolation treatment. Some sleep-improving drugs may inhibit the respiratory system and worsen the condition. Prolonged bedside instruction may increase the risk of medical infections.

**Objective:** To investigate the effect of progressive muscle relaxation on anxiety and sleep quality of COVID-19.

**Methods:** In this randomized controlled clinical trial, a total of 51 patients who entered the isolation ward were included in the study and randomly divided into experimental and control groups. The experimental group used progressive muscle relaxation (PMR) technology for 30 min per day for 5 consecutive days. During this period, the control group received only routine care and treatment. Before and after the intervention, the Spielberger State-Trait Anxiety Scale (STAI) and Sleep State Self-Rating Scale (SRSS) were used to measure and record patient anxiety and sleep quality. Finally, data analysis was performed using SPSS 25.0 software.

**Results:** The average anxiety score (STAI) before intervention was not statistically significant ( $P = 0.730$ ), and the average anxiety score after intervention was statistically significant ( $P < 0.001$ ). The average sleep quality score (SRSS) of the two groups before intervention was not statistically significant ( $P = 0.838$ ), and it was statistically significant after intervention ( $P < 0.001$ ).

**Conclusion:** Progressive muscle relaxation as an auxiliary method can reduce anxiety and improve sleep quality in patients with COVID-19.

### [Lui et al \(2020\) Respiratory Rehabilitation in Elderly Patients With COVID-19: A Randomized Controlled Study<sup>9</sup>](#)

**Background:** Different degrees of disorders are reported in respiratory function, physical function and psychological function in patients with coronavirus disease 2019 (COVID-19), especially in elderly patients. With the experience of improved and discharged COVID-19 patients, timely respiratory rehabilitation intervention may improve prognosis, maximize functional

preservation and improve quality of life (QoL), but there lacks of studies worldwide exploring the outcome of this intervention.

**Objective:** To investigate the effects of 6-week respiratory rehabilitation training on respiratory function, QoL, mobility and psychological function in elderly patients with COVID-19.

**Methods:** This paper reported the findings of an observational, prospective, quasi-experimental study, which totally recruited 72 participants, of which 36 patients underwent respiratory rehabilitation and the rest without any rehabilitation intervention. The following outcomes were measured: pulmonary function tests including plethysmography and diffusing lung capacity for carbon monoxide (DLCO), functional tests (6-min walk distance test), Quality of life (QoL) assessments (SF-36 scores), activities of daily living (Functional Independence Measure, FIM scores), and mental status tests (SAS anxiety and SDS depression scores).

**Results:** After 6 weeks of respiratory rehabilitation in the intervention group, there disclosed significant differences in FEV1(L), FVC(L), FEV1/FVC%, DLCO% and 6-min walk test. The SF-36 scores, in 8 dimensions, were statistically significant within the intervention group and between the two groups. SAS and SDS scores in the intervention group decreased after the intervention, but only anxiety had significant statistical significance within and between the two groups.

**Conclusions:** Six-week respiratory rehabilitation can improve respiratory function, QoL and anxiety of elderly patients with COVID-19, but it has little significant improvement on depression in the elderly.

### [Wei et al \(2020\) Efficacy of Internet-Based Integrated Intervention on Depression and Anxiety Symptoms in Patients With COVID-19<sup>10</sup>](#)

Public health crises, such as the outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) since Dec. 2019, are widely acknowledged as severe traumatic events that impose threats not only because of physical concerns but also because of the psychological distress of infected patients. We designed an internet-based integrated intervention and evaluated its efficacy on depression and anxiety symptoms in patients infected by SARS-CoV-2.

### [Zhang et al \(2020\) The Differential Psychological Distress of Populations Affected by the COVID-19 Pandemic<sup>11</sup>](#)

Coronavirus disease 2019 (COVID-19) initially outbreak in Wuhan, China in December 2019 and promptly became a pandemic worldwide within the





following two months. The public health emergencies resulting from COVID-19 are negatively impacting the mental health of the population and increasing the incidence of psychological crises. Early identification of populations in the first stages of psychological crisis will allow for the efficient implementation of interventional strategies. The clinical characteristics of psychological distress have not been well established across the populations affected by the COVID-19 pandemic, although a general increased level of mental distress has been reported from both the general public and frontline medical personnel.

### [\*\*Lyons et al \(2020\) Fallout From the COVID-19 Pandemic - Should We Prepare for a Tsunami of Post Viral Depression?\*\*](#)<sup>12</sup>

The current COVID-19 pandemic is not just a medical and social tragedy, but within the threat of the outbreak looms the potential for a significant and persistent negative mental health impact, based on previous experience with other pandemics such as SARS in 2003 and the earlier H1N1 outbreak of 1918. This piece will highlight the links between depression and viral illnesses and explore important overlaps with Myalgic Encephalomyelitis/Chronic Fatigue Syndrome, potentially implicating inflammatory mechanisms in those exposed to a range of viral agents. While containment of psychological distress currently focuses on social anxiety and quarantine measures, a second wave of psychological morbidity due to viral illness may be imminent.

### [\*\*Barker-Davies et al \(2020\) The Stanford Hall Consensus Statement for post-COVID-19 Rehabilitation\*\*](#)<sup>13</sup>

The highly infectious and pathogenic novel coronavirus (CoV), severe acute respiratory syndrome (SARS)-CoV-2, has emerged causing a global pandemic. Although COVID-19 predominantly affects the respiratory system, evidence indicates a multisystem disease which is frequently severe and often results in death. Long-term sequelae of COVID-19 are unknown, but evidence from previous CoV outbreaks demonstrates impaired pulmonary and physical function, reduced quality of life and emotional distress. Many COVID-19 survivors who require critical care may develop psychological, physical and cognitive impairments. There is a clear need for guidance on the rehabilitation of COVID-19 survivors. This consensus statement was developed by an expert panel in the fields of rehabilitation, sport and exercise medicine (SEM), rheumatology, psychiatry, general practice, psychology and specialist pain, working at the Defence Medical

Rehabilitation Centre, Stanford Hall, UK. Seven teams appraised evidence for the following domains relating to COVID-19 rehabilitation requirements: pulmonary, cardiac, SEM, psychological, musculoskeletal, neurorehabilitation and general medical. A chair combined recommendations generated within teams. A writing committee prepared the consensus statement in accordance with the appraisal of guidelines research and evaluation criteria, grading all recommendations with levels of evidence. Authors scored their level of agreement with each recommendation on a scale of 0-10. Substantial agreement (range 7.5-10) was reached for 36 recommendations following a chaired agreement meeting that was attended by all authors. This consensus statement provides an overarching framework assimilating evidence and likely requirements of multidisciplinary rehabilitation post COVID-19 illness, for a target population of active individuals, including military personnel and athletes.

### [Carda et al \(2020\) COVID-19 Pandemic. What Should PRM Specialists Do? A Clinician's Perspective<sup>14</sup>](#)

**Background:** COVID-19 pandemic is rapidly spreading all over the world, creating the risk for a healthcare collapse. While acute care and intensive care units are the main pillars of the early response to the disease, rehabilitative medicine should play an important part in allowing COVID-19 survivors to reduce disability and optimize the function of acute hospital setting.

**Aim:** To share the experience and the international perspective of different rehabilitation centres, treating COVID-19 survivors.

**Design:** Not applicable.

**Population:** COVID-19 survivors.

**Methods:** A group of Physical Medicine & Rehabilitation specialists from eleven different countries in Europe and North America have shared their clinical experience in dealing with COVID-19 survivors and how they have managed the re-organization of rehabilitation services.

**Results:** In our experience the most important sequelae of severe and critical forms of COVID-19 are: 1) respiratory; 2) cognitive, central and peripheral nervous system; 3) deconditioning; 4) critical illness related myopathy and neuropathy; 5) dysphagia; 6) joint stiffness and pain; 7) psychiatric.

**Conclusions:** We analyse all these consequences and propose some practical treatment options, based on current evidence and clinical



experience, as well as several suggestions for management of rehabilitation services and patients with suspected or confirmed infection by SARS-CoV-2. **Clinical rehabilitation impact:** COVID-19 survivors have some specific rehabilitation needs. Experience from other centres may help colleagues in organizing their services and providing better care to their patients.

### [Dasgupta et al \(2020\) Long term complications and rehabilitation of COVID-19 patients<sup>15</sup>](#)

With the ongoing pandemic of COVID-19 having caught the world almost unaware millions of people across the globe are presently grappling to deal with its acute effects. Our previous experience with members of the same corona virus family (SARS and MERS) which have caused two major epidemics in the past albeit of much lower magnitude, has taught us that the harmful effect of such outbreaks are not limited to acute complications alone. Long term cardiopulmonary, glucometabolic and neuropsychiatric complications have been documented following these infections. In the given circumstance it is therefore imperative to keep in mind the possible complications that may occur after the acute phase of the disease subsides and to prepare the healthcare system for such challenges.

### [Singh et al \(2020\) \[Preprint – not peer reviewed\] The British Thoracic Society survey of rehabilitation to support recovery of the Post COVID-19 population<sup>16</sup>](#)

**Objectives:** Those discharged from hospital after treatment for COVID-19 are likely to have significant and ongoing symptoms, functional impairment and psychological disturbances. There is an immediate need to develop a safe and efficient discharge process and recovery programme. Pulmonary rehabilitation is well placed to deliver a rehabilitation programme for this group but will most likely need to be adapted for the post COVID-19 population. The purpose of this survey was to rapidly identify the components of a post-COVID-19 rehabilitation assessment and elements of a successful rehabilitation programme that would be required to deliver a comprehensive service for those post COVID-19 to inform service delivery.

**Design:** A survey comprising a series of closed questions and a free text comments box allowing for a qualitative analysis.

**Setting:** Online survey. Participants British Thoracic Society members and multi-professional clinicians, across specialities were invited to take part.

**Results:** 1031 participants responded from a broad range of specialities over 6 days. There was overwhelming support for early post discharge from

hospital phase of the recovery programme to advise patients about the management of fatigue (95% agreed/ strongly agreed), breathlessness (94%), and mood disturbances (including symptoms of anxiety and depression) 92%. At the 6-8-week time point an assessment was considered important, focusing on the assessment of a broad range of possible symptoms and the need to potentially return to work.

**Recommendations:** for the intervention described a holistic programme focusing on symptom management, return of function and return to employment. The free text comments added depth to the survey and the need not to reinvent the wheel rather adapt well established (pulmonary rehabilitation) services to accommodate the needs of the post COVID-19 population. Conclusion The responses indicate the huge interest and the urgent need establish a programme to support and mitigate the long term impact of COVID-19.

### [Sheehy \(2020\) Considerations for Post-acute Rehabilitation for Survivors of COVID-19<sup>17</sup>](#)

Coronavirus disease (COVID-19), the infection caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first reported on December 31, 2019. Because it has only been studied for just over three months, our understanding of this disease is still incomplete, particularly regarding its sequelae and long-term outcomes. Moreover, very little has been written about the rehabilitation needs of patients with COVID-19 after discharge from acute care. The objective of this report is to answer the question "What rehabilitation services do survivors of COVID-19 require?" The question was asked within the context of a subacute hospital delivering geriatric inpatient and outpatient rehabilitation services. Three areas relevant to rehabilitation after COVID-19 were identified. First, details of how patients may present have been summarized, including comorbidities, complications from an intensive care unit stay with or without intubation, and the effects of the virus on multiple body systems, including those pertaining to cardiac, neurological, cognitive, and mental health. Second, I have suggested procedures regarding the design of inpatient rehabilitation units for COVID-19 survivors, staffing issues, and considerations for outpatient rehabilitation. Third, guidelines for rehabilitation (physiotherapy, occupational therapy, speech-language pathology) following COVID-19 have been proposed with respect to recovery of the respiratory system as well as recovery of mobility and function. A thorough assessment and an individualized, progressive treatment plan which focuses on function,



disability, and return to participation in society will help each patient to maximize their function and quality of life. Careful consideration of the rehabilitation environment will ensure that all patients recover as completely as possible.

### [Simpson and Robinson \(2020\) Rehabilitation After Critical Illness in People With COVID-19 Infection<sup>18</sup>](#)

The current COVID-19 pandemic will place enormous pressure on healthcare systems around the world. Large numbers of people are predicted to become critically ill with acute respiratory distress syndrome and will require management in intensive care units. High levels of physical, cognitive, and psychosocial impairments can be anticipated. Rehabilitation providers will serve as an important link in the continuum of care, helping move patients on from acute sites to eventual discharge to the community. Likely impairment patterns, considerations for healthcare practitioner resilience, and organization of services to meet demand are discussed. Innovative approaches to care, such as virtual rehabilitation, are likely to become common in this environment.

### [Xiang et al \(2020\) Timely Mental Health Care for the 2019 Novel Coronavirus Outbreak Is Urgently Needed<sup>19</sup>](#)

Patients with confirmed or suspected 2019-nCoV may experience fear of the consequences of infection with a potentially fatal new virus, and those in quarantine might experience boredom, loneliness, and anger. Furthermore, symptoms of the infection, such as fever, hypoxia, and cough, as well as adverse effects of treatment, such as insomnia caused by corticosteroids, could lead to worsening anxiety and mental distress.

NON COVID-19

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SARS

### [Garnder and Moallem \(2015\) Psychological Impact on SARS Survivors: Critical Review of the English Language Literature<sup>20</sup>](#)

Severe acute respiratory syndrome (SARS) has been labelled a mental health catastrophe, an infectious atypical pneumonia condition that spread to 29 countries in 2002/2003, infecting over 8,000 people, 774 of whom died. A literature search on electronic databases, including MEDLINE, PsycINFO, CINAHL, and Cochrane Library was used to conduct a critical review of the

English language literature on the psychological impact of SARS for survivors. Twenty original studies pertaining to the psychological experience of patients revealed prominent symptoms: in the acute and early recovery stages, psychotic symptomatology, fear for survival, and fear of infecting others; across all timeframes, stigmatization, reduced quality of life, and psychological distress; posttraumatic stress symptoms were prevalent across all stages post-SARS. Health care workers with SARS were found to be at increased risk. Limitations within many studies restrict the optimal usefulness of the findings. Studies included in our review consistently reported high rates of emotional distress among survivors, persisting for years post infection.

### [Wing and Leung \(2012\) Mental Health Impact of Severe Acute Respiratory Syndrome: A Prospective Study<sup>21</sup>](#)

The severe acute respiratory syndrome (SARS) epidemic struck Hong Kong in 2003. Varying rates of mental health morbidity were reported during the acute and early discharge period. The impact of SARS did not end with the resolution of the infection. During the rehabilitation period, many patients had to face psychosocial difficulties including stigmatisation, grief reactions, unemployment, functional impairment, and medical co-morbidities. Despite improvements in physical condition, the stress and psychiatric symptoms persisted even after 1 year. Chronic fatigue was common among SARS survivors. There seemed to be a reciprocal association between fatigue problems and psychiatric disorders. Dysregulation in endocrine functions, especially of the hypothalamo-pituitary-adrenal (HPA) axis, was common in those with psychiatric disorders and chronic fatigue syndrome (CFS). This study aimed to investigate the prevalence and associated risk factors for psychiatric disorders and CFS in SARS survivors, and the association between HPA status and CFS.

### [Lam et al \(2009\) Mental Morbidities and Chronic Fatigue in Severe Acute Respiratory Syndrome Survivors: Long-Term Follow-Up<sup>22</sup>](#)

**Background:** Short-term follow-up studies of severe acute respiratory syndrome (SARS) survivors suggested that their physical conditions continuously improved in the first year but that their mental health did not. We investigated long-term psychiatric morbidities and chronic fatigue among SARS survivors.

**Methods:** All SARS survivors from the hospitals of a local region in Hong Kong were assessed by a constellation of psychometric questionnaires and a



semi-structured clinical interview for the Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition) to determine the presence of psychiatric disorders and chronic fatigue problems.

**Results:** Of 369 SARS survivors, 233 (63.1%) participated in the study (mean period of time after SARS, 41.3 months). Over 40% of the respondents had active psychiatric illnesses, 40.3% reported a chronic fatigue problem, and 27.1% met the modified 1994 Centres for Disease Control and Prevention criteria for chronic fatigue syndrome. Logistic regression analysis suggested that being a health care worker at the time of SARS infection (odds ratio [OR], 3.24; 95% confidence interval [CI], 1.12- 9.39;  $P = .03$ ), being unemployed at follow-up (OR, 4.71; 95% CI, 1.50-14.78;  $P = .008$ ), having a perception of social stigmatization (OR, 3.03; 95% CI, 1.20-7.60;  $P = .02$ ), and having applied to the SARS survivors' fund (OR, 2.92; 95% CI, 1.18-7.22;  $P = .02$ ) were associated with an increased risk of psychiatric morbidities at follow-up, whereas application to the SARS survivors' fund (OR, 2.64; 95% CI, 1.07-6.51;  $P = .04$ ) was associated with increased risk of chronic fatigue problems.

**Conclusions:** Psychiatric morbidities and chronic fatigue persisted and continued to be clinically significant among the survivors at the 4-year follow-up. Optimization of the treatment of mental health morbidities by a multidisciplinary approach with a view for long-term rehabilitation, especially targeting psychiatric and fatigue problems and functional and occupational rehabilitation, would be needed.

### [Lee et al \(2007\) Stress and Psychological Distress Among SARS Survivors 1 Year After the Outbreak<sup>23</sup>](#)

**Objective:** Our study examined the stress level and psychological distress of severe acute respiratory syndrome (SARS) survivors 1 year after the outbreak.

**Method:** During the SARS outbreak in 2003, we used the 10-item Perceived Stress Scale (PSS-10) to assess SARS survivors treated in 2 major hospitals (non-health care workers,  $n = 49$ ; health care workers,  $n = 30$ ). We invited SARS survivors from the same hospitals (non-health care workers,  $n = 63$ ; health care workers,  $n = 33$ ) to complete the PSS-10 again in 2004. At that time, they were also asked to complete the General Health Questionnaire (GHQ-12) and measures of depression, anxiety, and posttraumatic symptoms. PSS-10 scores were also obtained from matched community control subjects during the outbreak ( $n = 145$ ) and again in 2004 ( $n = 112$ ).

**Results:** SARS survivors had higher stress levels during the outbreak, compared with control subjects (PSS-10 scores = 19.8 and 17.9, respectively;

$P < 0.01$ ), and this persisted 1 year later (PSS-10 scores = 19.9 and 17.3, respectively;  $P < 0.01$ ) without signs of decrease. In 2004, SARS survivors also showed worrying levels of depression, anxiety, and posttraumatic symptoms. An alarming proportion (64%) scored above the GHQ-12 cut-off that suggests psychiatric morbidity. During the outbreak, health care worker SARS survivors had stress levels similar to those of non-health care workers, but health care workers showed significantly higher stress levels in 2004 (PSS-10 score = 22.8, compared with PSS-10 score = 18.4;  $P < 0.05$ ) and had higher depression, anxiety, posttraumatic symptoms, and GHQ-12 scores.

**Conclusions:** One year after the outbreak, SARS survivors still had elevated stress levels and worrying levels of psychological distress. The situation of health care worker SARS survivors is particularly worrying. The long-term psychological implications of infectious diseases should not be ignored. Mental health services could play an important role in rehabilitation.

### [Kwek et al \(2006\) Quality of Life and Psychological Status in Survivors of Severe Acute Respiratory Syndrome at 3 Months Post discharge<sup>24</sup>](#)

**Background:** Little is known about the long-term consequence of severe acute respiratory syndrome (SARS). We carried out an assessment on SARS patients after their recovery from their acute illness.

**Method:** Postal survey comprising Health-Related Quality of Life (HRQoL) questionnaires and anxiety and depression measures was sent to them at 3 months' post discharge.

**Results:** There was a significant impairment in both the HRQoL and mental functioning. Forty-one percent had scores indicative of a posttraumatic stress disorder (PTSD); about 30% had likely anxiety and depression.

**Conclusion:** SARS has significant impact on HRQoL and psychological status at 3 months.

### [Wu et al \(2005\) Posttraumatic Stress, Anxiety, and Depression in Survivors of Severe Acute Respiratory Syndrome \(SARS\)<sup>25</sup>](#)

This study examines the psychological impact of severe acute respiratory syndrome (SARS) in 195 adult patients in Hong Kong. The Impact of Event Scale-Revised and Hospital Anxiety and Depression Scale were administered to patients 1 month after their discharge. Of the participants 10% to 18% reported symptoms related to posttraumatic stress disorder, anxiety, and depression. Symptom severity was associated with high perceived life threat and low emotional support. Women and participants who had low education



level were more likely to have symptoms of avoidance. Participants who personally knew someone who had SARS were more likely to be affected by depressive symptoms.

### [Chua et al \(2004\) Stress and Psychological Impact on SARS Patients During the Outbreak<sup>26</sup>](#)

**Objective:** To examine stress and psychological impact in severe acute respiratory syndrome (SARS) patients during the 2003 outbreak. SARS is a novel, highly infectious pneumonia, and its psychological impact is still unclear.

**Method:** At the peak of the outbreak, SARS patients (n = 79) and healthy control subjects (n = 145) completed the Perceived Stress Scale (PSS) and documented a range of psychological responses. Groups were balanced for age, sex, education, and living circumstances.

**Results:** Stress was significantly higher in SARS patients than in healthy control subjects. Stress correlated significantly with negative psychological effects. Of SARS patients, 39% (n = 30) were infected health care workers; these individuals reported significantly more fatigue and worries about health than did other patients. Of patients, 25% (n = 20) requested psychological follow-up.

**Conclusions:** General stress and negative psychological effects are increased in SARS patients, particularly among infected health care workers. This may increase the risk of mood and stress-related disorders. Functional impairment is apparent in the post recovery phase.

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## CRITICAL ILLNESS

### [Dijkstra-Kersten et al \(2020\) Neuropsychiatric Outcome in Subgroups of Intensive Care Unit Survivors: Implications for After-Care<sup>27</sup>](#)

**Purpose:** Poor neuropsychiatric outcomes are common in survivors of critical illness but it is unclear what patient groups to target for interventions to improve mental health. We compared anxiety, depression, and post-traumatic stress disorder (PTSD) symptoms and health-related quality of life (HrQoL) across different subgroups of Intensive Care Unit (ICU) survivors.

**Materials and methods:** A single-centre cohort study was conducted in a mixed-ICU in the Netherlands among survivors of an ICU admission  $\geq 48$  h (n = 1730). Survivors received a survey one year after discharge, containing the Hospital Anxiety and Depression Scale (HADS), Impact of Event Scale

(IES/IES-R), and EQ-5D (response rate of 67%). Neuropsychiatric symptoms and quality of life were evaluated in a priori defined subgroups, by chi-square tests and Mann-Whitney U tests.

**Results:** Symptoms of anxiety (HADS anxiety  $\geq 8$ ), depression (HADS depression  $\geq 8$ ), and PTSD (IES  $\geq 35$ ; IES-R  $\geq 1.6$ ) were reported by 34%, 33%, and 19% of ICU survivors, with a median HrQoL utility score of 0.81 (IQR:0.65-1.00). These figures were similar for survivors of ARDS, sepsis, severe multiple organ failure (SOFA $>11$ ), or ICU stay  $\geq 7$  days.

**Conclusions:** This underlines the importance of prevention and treatment for neuropsychiatric symptoms in ICU survivors in general, not only in specific patient groups.

### [Hatch et al \(2018\) Anxiety, Depression and Post Traumatic Stress Disorder After Critical Illness: A UK-wide Prospective Cohort Study<sup>28</sup>](#)

**Background:** Survivors of intensive care are known to be at increased risk of developing longer-term psychopathology issues. We present a large UK multicentre study assessing the anxiety, depression and post-traumatic stress disorder (PTSD) cases in the first year following discharge from an intensive care unit (ICU).

**Methods:** Design: prospective multicentre follow-up study of survivors of ICU in the UK.

**Setting:** patients from 26 ICUs in the UK.

**Inclusion criteria:** patients who had received at least 24 h of level 3 ICU care and were 16 years of age or older.

**Interventions:** postal follow up: Hospital Anxiety and Depression Score (HADS) and the Post-Traumatic Stress Disorder (PTSD) Check List-Civilian (PCL-C) at 3 and 12 months following discharge from ICU.

**Main outcome measure:** caseness of anxiety, depression and PTSD, 2-year survival.

**Results:** In total, 21,633 patients admitted to ICU were included in the study. Postal questionnaires were sent to 13,155 survivors; of these 38% (4943/13155) responded and 55% (2731/4943) of respondents passed thresholds for one or more condition at 3 or 12 months following discharge. Caseness prevalence was 46%, 40% and 22% for anxiety, depression and PTSD respectively; 18% (870/4943 patients) met the caseness threshold for all three psychological conditions. Patients with symptoms of depression were 47% more likely to die during the first 2 years after discharge from ICU than those without (HR 1.47, CI 1.19-1.80).

**Conclusions:** Over half of those who respond to postal questionnaire following treatment on ICU in the UK reported significant symptoms of anxiety, depression or PTSD. When symptoms of one psychological disorder are present, there is a 65% chance they will co-occur with symptoms of one of the other two disorders. Depression following critical illness is associated with an increased mortality risk in the first 2 years following discharge from ICU.

### [Nikayin et al \(2016\) Anxiety Symptoms in Survivors of Critical Illness: A Systematic Review and Meta-Analysis<sup>29</sup>](#)

**Objectives:** To evaluate the epidemiology of and post intensive care unit (ICU) interventions for anxiety symptoms after critical illness.

**Methods:** We searched five databases (1970-2015) to identify studies assessing anxiety symptoms in adult ICU survivors. Data from studies using the most common assessment instrument were meta-analysed.

**Results:** We identified 27 studies (2880 patients) among 27,334 citations. The Hospital Anxiety and Depression Scale-Anxiety (HADS-A) subscale was the most common instrument (81% of studies). We pooled data at 2-3, 6 and 12-14month time-points, with anxiety symptom prevalence's [HADS-A $\geq$ 8, 95% confidence interval (CI)] of 32%(27-38%), 40%(33-46%) and 34%(25-42%), respectively. In a subset of studies with repeated assessments in the exact same patients, there was no significant change in anxiety score or prevalence over time. Age, gender, severity of illness, diagnosis and length of stay were not associated with anxiety symptoms. Psychiatric symptoms during admission and memories of in-ICU delusional experiences were potential risk factors. Physical rehabilitation and ICU diaries had potential benefit.

**Conclusions:** One third of ICU survivors experience anxiety symptoms that are persistent during their first year of recovery. Psychiatric symptoms during admission and memories of in-ICU delusional experiences were associated with post-ICU anxiety. Physical rehabilitation and ICU diaries merit further investigation as possible interventions.

### [Rabiee et al \(2016\) Depressive Symptoms After Critical Illness: A Systematic Review and Meta-Analysis<sup>30</sup>](#)

**Objectives:** To synthesize data on prevalence, natural history, risk factors, and post-ICU interventions for depressive symptoms in ICU survivors.



**Data sources:** PubMed, EMBASE, Cumulative Index of Nursing and Allied Health Literature, PsycINFO, and Cochrane Controlled Trials Registry (1970-2015).

**Study selection:** Studies measuring depression after hospital discharge using a validated instrument in more than 20 adults from non-specialty ICUs.

**Data extraction:** Duplicate independent review and data abstraction.

**Data synthesis:** The search identified 27,334 titles, with 42 eligible articles on 38 unique studies (n = 4,113). The Hospital Anxiety and Depression Scale-Depression subscale was used most commonly (58%). The pooled Hospital Anxiety and Depression Scale-Depression subscale prevalence (95% CI) of depressive symptoms at a threshold score greater than or equal to 8 was 29% (22-36%) at 2-3 months (12 studies; n = 1,078), 34% (24-43%) at 6 months (seven studies; n = 760), and 29% (23-34%) at 12-14 months (six studies; n = 1,041). The prevalence of suprathreshold depressive symptoms (compatible with Hospital Anxiety and Depression Scale-Depression subscale,  $\geq 8$ ) across all studies, using all instruments, was between 29% and 30% at all three time points. The pooled change in prevalence (95% CI) from 2-3 to 6 months (four studies; n = 387) was 5% (-1% to +12%), and from 6 to 12 months (three studies; n = 412) was 1% (-6% to +7%). Risk factors included pre-ICU psychologic morbidity and presence of in-ICU psychologic distress symptoms. We did not identify any post-ICU intervention with strong evidence of improvement in depressive symptoms.

**Conclusions:** Clinically important depressive symptoms occurred in approximately one-third of ICU survivors and were persistent through 12-month follow-up. Greater research into treatment is needed for this common and persistent post-ICU morbidity.

### [Parker et al \(2015\) Posttraumatic Stress Disorder in Critical Illness Survivors: A Meta-analysis<sup>31</sup>](#)

**Objective:** To conduct a systematic review and meta-analysis of the prevalence, risk factors, and prevention/treatment strategies for posttraumatic stress disorder symptoms in critical illness survivors.

**Data sources:** PubMed, Embase, CINAHL, PsycINFO, and Cochrane Library from inception through March 5, 2014.

**Study selection:** Eligible studies met the following criteria: 1) adult general/non-specialty ICU, 2) validated posttraumatic stress disorder instrument greater than or equal to 1 month post-ICU, and 3) sample size greater than or equal to 10 patients.



**Data extraction:** Duplicate independent review and data abstraction from all eligible titles/abstracts/full-text articles.

**Data synthesis:** The search identified 2,817 titles/abstracts, with 40 eligible articles on 36 unique cohorts (n = 4,260 patients). The Impact of Event Scale was the most common posttraumatic stress disorder instrument. Between 1 and 6 months post-ICU (six studies; n = 456), the pooled mean (95% CI) Impact of Event Scale score was 20 (17-24), and the pooled prevalence's of clinically important posttraumatic stress disorder symptoms (95% CI) were 25% (18-34%) and 44% (36-52%) using Impact of Event Scale thresholds greater than or equal to 35 and greater than or equal to 20, respectively. Between 7 and 12 months post-ICU (five studies; n = 698), the pooled mean Impact of Event Scale score was 17 (9-24), and pooled prevalence's of posttraumatic stress disorder symptoms were 17% (10-26%) and 34% (22-50%), respectively. ICU risk factors for posttraumatic stress disorder symptoms included benzodiazepine administration and post-ICU memories of frightening ICU experiences. Posttraumatic stress disorder symptoms were associated with worse quality of life. In European-based studies: 1) an ICU diary was associated with a significant reduction in posttraumatic stress disorder symptoms, 2) a self-help rehabilitation manual was associated with significant posttraumatic stress disorder symptom reduction at 2 months, but not 6 months; and 3) a nurse-led ICU follow-up clinic did not reduce posttraumatic stress disorder symptoms.

**Conclusions:** Clinically important posttraumatic stress disorder symptoms occurred in one fifth of critical illness survivors at 1-year follow-up, with higher prevalence in those who had comorbid psychopathology, received benzodiazepines, and had early memories of frightening ICU experiences. In European studies, ICU diaries reduced posttraumatic stress disorder symptoms.

### [Geense \(2019\) Non-pharmacologic Interventions to Prevent or Mitigate Adverse Long-Term Outcomes Among ICU Survivors: A Systematic Review and Meta-Analysis<sup>32</sup>](#)

**Objective:** ICU survivors suffer from long-lasting physical, mental, and cognitive health impairments, also called "post-intensive care syndrome". However, an overview of the effectiveness of interventions to prevent or mitigate these impairments is lacking. The aim of this study is to assess the effectiveness of non-pharmacologic interventions.

**Data sources:** PubMed, CINAHL, PsycINFO, Embase, and Cochrane Library were systematically searched from inception until July 19, 2018.



**Study selection:** (Non)randomized clinical trials, controlled before-after studies, and interrupted time series were included. Outcomes of interest included patients physical, mental and cognitive outcomes, quality of life, and outcomes such as social functioning and functional status, measured after hospital discharge.

**Data extraction:** Two independent reviewers selected studies, extracted data, and assessed the risk of bias. Pooled mean differences and standardized mean differences were calculated using random-effect meta-analyses.

**Data synthesis:** After screening 17,008 articles, 36 studies, including 10 pilot studies, were included (n = 5,165 ICU patients). Interventions were subdivided into six categories: 1) exercise and physical rehabilitation programs; 2) follow-up services; 3) psychosocial programs; 4) diaries; 5) information and education; and 6) other interventions. Many outcomes favoured the interventions, but significant differences were only found for diaries in reducing depression (two studies, n = 88; standardized mean difference, 0.68; 95% CI, 0.14-1.21) and anxiety (two studies, n = 88; standardized mean difference, 0.44; 95% CI, 0.01-0.87) and exercise programs in improving the Short Form Health Survey-36 Mental Component Score (seven studies, n = 664; mean difference, 2.62; 95% CI, 0.92-4.32).

**Conclusions:** There is thin evidence that diaries and exercise programs have a positive effective on mental outcomes. Despite outcomes favouring the intervention group, other commonly used non-pharmacologic interventions in daily ICU practice are not supported by conclusive evidence from this meta-analysis. To improve recovery programs for ICU survivors, more evidence is needed from robust intervention studies using standardized outcomes.

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## OTHER

### [European Respiratory Society Ad Hoc International Task Force \(2020\) REPORT OF AN AD-HOC INTERNATIONAL TASK FORCE TO DEVELOP AN EXPERT-BASED OPINION ON EARLY AND SHORT-TERM REHABILITATIVE INTERVENTIONS \(AFTER THE ACUTE HOSPITAL SETTING\) IN COVID-19 SURVIVORS<sup>33</sup>](#)

This is an expert-based opinion on early and short-term rehabilitative interventions in COVID-19 survivors after the acute hospital setting. The text consists of several parts: What do we know? What don't we know; and a preliminary expert-based conclusion and preliminary clinical recommendations, based on current knowledge. This is a living document and will be updated regularly.

### [British Society of Rehabilitation Medicine \(2020\) Rehabilitation in the wake of COVID-19 - A phoenix from the ashes<sup>34</sup>](#)

Rehabilitation forms a critical component of the acute care pathway, helping to relieve pressure on the acute and frontline services. It is shown to be both effective and cost-effective, whether through improving independence and societal reintegration; or managing the impacts of long-term disability including neuro-palliative care. The COVID-19 pandemic has already led to a marked increase in the burden of disease and disability and will continue to do so. It has produced many new challenges:

- A diminished workforce due to sickness, shielding and redeployment to frontline services.
- The many impacts of social distancing including
  - socio-economic and psychosocial effects
  - isolation of patients from their families
  - restrictions on interventions that involve hands-on treatment, group interventions or aerosol generating procedures.
- An as yet unquantifiable additional case-load of patients with post-Covid disability presenting with a wide range of problems due to cardio-pulmonary, musculoskeletal, neurological and psychological/psychiatric complications of the disease, compounded in many cases by deconditioning from prolonged stays in ITU.



Produced by the members of the National Health Library and Knowledge Service Evidence Team<sup>†</sup>. Current as at [5 June 2020]. This evidence summary collates the best available evidence at the time of writing and **does not replace clinical judgement or guidance**. Emerging literature or subsequent developments in respect of COVID-19 may require amendment to the information or sources listed in the document. Although all reasonable care has been taken in the compilation of content, the National Health Library and Knowledge Service Evidence Team makes no representations or warranties expressed or implied as to the accuracy or suitability of the information or sources listed in the document. This evidence summary is the property of the National Health Library and Knowledge Service and subsequent re-use or distribution in whole or in part should include acknowledgement of the service.

The following PICO(T) was used as a basis for the evidence summary:

<b>P</b> Population person location condition/patient characteristic	Patients recovering from COVID-19
<b>I</b> Intervention length location type	
<b>C</b> Comparison another intervention no intervention location of the intervention	
<b>O</b> Outcome	Psychological impact

The following search strategy was used:

Coronavirinae/ OR COVID-19 OR coronavirus OR "corona virus" OR (Wuhan adj3 virus) OR ("2019-NCov" OR "2019 nCoV") OR "severe acute respiratory syndrome coronavirus 2" OR SARS-Cov-2 OR ("2019" AND (new OR novel) AND coronavirus)  
 AND  
 Rehabilitation OR Rehabilitation care OR Rehabilitation medicine OR Rehabilitation patient OR Aftercare OR critical care OR Intensive care  
 AND  
 Psychological aspect OR Psychosocial rehabilitation OR "psychological impact" OR anxiety OR depression OR "posttraumatic stress disorder"

<sup>†</sup> Julia Reynolds, Librarian, Mayo University Hospital [Author]; Brendan Leen, Area Library Manager, HSE South [Editor];



<sup>1</sup> World Health Organization. (2020). *Clinical management of COVID-19: interim guidance, 27 May 2020* (No. WHO/2019-nCoV/clinical/2020.5). World Health Organization. <https://apps.who.int/iris/bitstream/handle/10665/332196/WHO-2019-nCoV-clinical-2020.5-eng.pdf> [Accessed 3 June 2020]

<sup>2</sup> UpToDate. Coronavirus disease 2019 (COVID-19): Psychiatric illness. <https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19-psychiatric-illness> [Accessed 3 June 2020]

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