COVID-19: updates on follow-up & long-term effects

11th February 2021

**guidance**

**Title:** **WHO RECOMMENDS FOLLOW-UP CARE, LOW-DOSE ANTICOAGULANTS FOR COVID-19 PATIENTS**

**Source**: WHO, 26th January 2021

WHO recommends that patients who have COVID-19 - both confirmed and suspected - should have access to follow-up care if they have persistent, new or changing symptoms. This is one of the recommendations made by WHO in revised clinical management guidelines.

Evidence was gathered on the post COVID condition, so-called ‘long COVID’, where people who have recovered from COVID-19 continue to have longer-term issues like extreme fatigue, persistent cough and exercise intolerance.

Understanding this condition is one of WHO’s priority areas of work. In February 2021, WHO will organize a series of consultations to reach consensus on a description of this condition and its subtypes, and case definitions. This scientific understanding will inform the name of the condition. The consultations will include a broad range of stakeholders, including patient groups.

<https://www.who.int/news-room/feature-stories/detail/who-recommends-follow-up-care-low-dose-anticoagulants-for-covid-19-patients>

**research papers**

**Title:** **RESPIRATORY AND PSYCHOPHYSICAL SEQUELAE AMONG PATIENTS WITH COVID-19 FOUR MONTHS AFTER HOSPITAL DISCHARGE**

**Source**: JAMA Network Open, 2021;4, 21 January 2021

Question: What respiratory, functional, and psychological sequalae are associated with recovery from coronavirus disease 2019 (COVID-19)? Findings: In this cohort study of 238 patients with COVID-19 hospitalized in an academic hospital in Northern Italy, more than half of participants had a significant reduction of diffusing lung capacity for carbon monoxide or measurable functional impairment and approximately one-fifth of patients had symptoms of posttraumatic stress 4 months after discharge. Meaning: These findings suggest that despite virological recovery, a sizable proportion of patients with COVID-19 experienced respiratory, functional, or psychological sequelae months after hospital discharge.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2775643?utm_source=silverchair&utm_campaign=jama_network&utm_content=covid_weekly_highlights&utm_medium=email>

**Title:** **THE POST-ICU PRESENTATION SCREEN (PICUPS) AND REHABILITATION PRESCRIPTION (RP) FOR INTENSIVE CARE SURVIVORS PART II: CLINICAL ENGAGEMENT AND FUTURE DIRECTIONS FOR THE NATIONAL POST-INTENSIVE CARE REHABILITATION COLLABORATIVE**  
Source: Journal of The Intensive Care Society; Feb 2021

Background: Many Intensive Care Unit (ICU) survivors suffer from a multi-system disability, termed the post-intensive care syndrome. There is no current national coordination of either rehabilitation pathways or related data collection for them. In the last year, the need for tools to systematically identify the multidisciplinary rehabilitation needs of severely affected COVID-19 survivors has become clear. Such tools offer the opportunity to improve rehabilitation for all critical illness survivors through provision of a personalised Rehabilitation Prescription (RP). The initial development and secondary refinement of such an assessment and data tools is described in the linked paper. We report here the clinical and workforce data that was generated as a result.

<https://journals.sagepub.com/doi/10.1177/1751143720988708>

**Title:** **SHORT-TERM OUTPATIENT FOLLOW-UP OF COVID-19 PATIENTS: A MULTIDISCIPLINARY APPROACH**  
Source: EClinical Medicine (publ. by The Lancet); Jan 2021 ; p. 100731 Publication Date Jan 2021

Background: Short-term follow-up of COVID-19 patients reveals pulmonary dysfunction, myocardial damage and severe psychological distress. Little is known of the burden of these sequelae, and there are no clear recommendations for follow-up of COVID-19 patients. In this multi-disciplinary evaluation, cardiopulmonary function and psychological impairment after hospitalization for COVID-19 are mapped. Methods: We evaluated patients at our outpatient clinic 6 weeks after discharge. Cardiopulmonary function was measured by echocardiography, 24-hours ECG monitoring and pulmonary function testing. Psychological adjustment was measured using questionnaires and semi-structured clinical interviews. A comparison was made between patients admitted to the general ward and Intensive care unit (ICU), and between patients with a high versus low functional status.

Findings: Eighty-one patients were included of whom 34 (41%) had been admitted to the ICU. New York Heart Association class II-III was present in 62% of the patients. Left ventricular function was normal in 78% of patients. ICU patients had a lower diffusion capacity (mean difference 12,5% P = 0.01), lower forced expiratory volume in one second and forced vital capacity (mean difference 14.9%; P<0.001; 15.4%; P<0.001; respectively). Risk of depression, anxiety and PTSD were 17%, 5% and 10% respectively and similar for both ICU and non-ICU patients. Interpretation: Overall, most patients suffered from functional limitations. Dyspnea on exertion was most frequently reported, possibly related to decreased DLCOc. This could be caused by pulmonary fibrosis, which should be investigated in long-term follow-up. In addition, mechanical ventilation, deconditioning, or pulmonary embolism may play an important role.

<https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(21)00011-0/fulltext>

**Title:** **DISCHARGE CLINICAL CHARACTERISTICS AND POST-DISCHARGE EVENTS IN PATIENTS WITH SEVERE COVID-19: A DESCRIPTIVE CASE SERIES**

**Source**: Journal of General Internal Medicine; Feb 2021

BACKGROUND: As the SARS-CoV-2 pandemic continues, little guidance is available on clinical indicators for safely discharging patients with severe COVID-19. OBJECTIVE: To describe the clinical courses of adult patients admitted for COVID-19 and identify associations between inpatient clinical features and post-discharge need for acute care. DESIGN: Retrospective chart reviews were performed to record laboratory values, temperature, and oxygen requirements of 99 adult inpatients with COVID-19. Those variables were used to predict emergency department (ED) visit or readmission within 30 days post-discharge. PATIENTS (OR PARTICIPANTS): Age ≥ 18 years, first hospitalization for COVID-19, admitted between March 1 and May 2, 2020, at University of California, Los Angeles (UCLA) Medical Center, managed by an inpatient medicine service. MAIN MEASURES: Ferritin, C-reactive protein, lactate dehydrogenase, D-dimer, procalcitonin, white blood cell count, absolute lymphocyte count, temperature, and oxygen requirement were noted. KEY RESULTS: Of 99 patients, five required ED admission within 30 days, and another five required readmission. Fever within 24 h of discharge, oxygen requirement, and laboratory abnormalities were not associated with need for ED visit or readmission within 30 days of discharge after admission for COVID-19. CONCLUSION: Our data suggest that neither persistent fever, oxygen requirement, nor laboratory marker derangement was associated with need for acute care in the 30-day period after discharge for severe COVID-19. These findings suggest that physicians need not await the normalization of laboratory markers, resolution of fever, or discontinuation of oxygen prior to discharging a stable or improving patient with COVID-19.

<https://link.springer.com/article/10.1007/s11606-020-06494-7>

**Title:** **COVID-19 AND ITS SEQUELAE: A PLATFORM FOR OPTIMAL PATIENT CARE, DISCOVERY AND TRAINING**  
Source: Journal of Thrombosis and Thrombolysis; Jan 2021

COVID-19- related patient care and research have focused on short-term outcomes, particularly among those with underlying or pre-existing medical conditions. A major focus has been on mortality rates. Broadening the dialogue is neither meant nor intended to disparage the near-term devastation felt globally each day, but rather to begin preparation for optimally caring for and addressing the needs of survivors. The sequelae of COVID-19 includes acute, subacute and chronic stages of the condition. If one applies current World Health Organization (WHO) statistics to calculate the global burden of disease, there are 98,000,000 COVID-19 survivors. The following editorial focuses on post-COVID sequelae as a continuum of patient care needs, as well as discovery and training opportunities in an academic setting.

<https://pubmed.ncbi.nlm.nih.gov/33501596/>

**Title:** **MORE THAN 50 LONG-TERM EFFECTS OF COVID-19: A SYSTEMATIC REVIEW AND META-ANALYSIS**  
MedRxiv : the preprint server for health sciences; 30th Jan 2021

[*This article is a preprint and has not been peer-reviewed. It reports new medical research that has yet to be evaluated and so should*not*be used to guide clinical practice.*](https://www.medrxiv.org/content/what-unrefereed-preprint)

COVID-19, caused by SARS-CoV-2, can involve sequelae and other medical complications that last weeks to months after initial recovery, which has come to be called Long-COVID or COVID long-haulers. This systematic review and meta-analysis aims to identify studies assessing long-term effects of COVID-19 and estimates the prevalence of each symptom, sign, or laboratory parameter of patients at a post-COVID-19 stage. LitCOVID (PubMed and Medline) and Embase were searched by two independent researchers. All articles with original data for detecting long-term COVID-19 published before 1st of January 2021 and with a minimum of 100 patients were included. For effects reported in two or more studies, meta-analyses using a random-effects model were performed using the MetaXL software to estimate the pooled prevalence with 95% CI. Heterogeneity was assessed using I2 statistics. The Preferred Reporting Items for Systematic Reviewers and Meta-analysis (PRISMA) reporting guideline was followed. A total of 18,251 publications were identified, of which 15 met the inclusion criteria. The prevalence of 55 long-term effects was estimated, 21 meta-analyses were performed, and 47,910 patients were included. The follow-up time ranged from 15 to 110 days post-viral infection. The age of the study participants ranged between 17 and 87 years. It was estimated that 80% (95% CI 65-92) of the patients that were infected with SARS-CoV-2 developed one or more long-term symptoms. The five most common symptoms were fatigue (58%), headache (44%), attention disorder (27%), hair loss (25%), and dyspnea (24%). All meta-analyses showed medium (n=2) to high heterogeneity (n=13). In order to have a better understanding, future studies need to stratify by sex, age, previous comorbidities, severity of COVID-19 (ranging from asymptomatic to severe), and duration of each symptom. From the clinical perspective, multidisciplinary teams are crucial to developing preventive measures, rehabilitation techniques, and clinical management strategies with whole-patient perspectives designed to address long COVID-19 care.

<https://www.medrxiv.org/content/10.1101/2021.01.27.21250617v2>

**TITLE: SIX-MONTH NEUROLOGICAL AND PSYCHIATRIC OUTCOMES IN 236,379 SURVIVORS OF COVID-19**

Source: MedRxiv : the preprint server for health sciences; 24th January 2021

[*This article is a preprint and has not been peer-reviewed. It reports new medical research that has yet to be evaluated and so should*not*be used to guide clinical practice.*](https://www.medrxiv.org/content/what-unrefereed-preprint)

Background: Neurological and psychiatric sequelae of COVID-19 have been reported, but there are limited data on incidence rates and relative risks.

Methods Using retrospective cohort studies and time-to-event analysis, we estimated the incidence of ICD-10 diagnoses in the 6 months after a confirmed diagnosis of COVID-19: intracranial haemorrhage; ischaemic stroke; Parkinsonism; Guillain-Barré syndrome; nerve/nerve root/plexus disorders; myoneural/muscle disease; encephalitis; dementia; mood, anxiety, and psychotic disorders; substance misuse; and insomnia. Data were obtained from the TriNetX electronic health records network (over 81 million patients). We compared incidences with those in propensity score-matched cohorts of patients with influenza or other respiratory infections using a Cox model. We investigated the effect on incidence estimates of COVID-19 severity, as proxied by hospitalization and encephalopathy (including delirium and related disorders).

Findings 236,379 patients survived a confirmed diagnosis of COVID-19. Among them, the estimated incidence of neurological or psychiatric sequelae at 6 months was 33.6%, with 12.8% receiving their first such diagnosis. Most diagnostic categories were commoner after COVID-19 than after influenza or other respiratory infections (hazard ratios from 1.21 to 5.28), including stroke, intracranial haemorrhage, dementia, and psychotic disorders. Findings were equivocal for Parkinsonism and Guillain-Barré syndrome. Amongst COVID-19 cases, incidences and hazard ratios for most disorders were higher in patients who had been hospitalized, and markedly so in those who had experienced encephalopathy. Results were robust to sensitivity analyses, including comparisons against an additional four index health events.

Interpretation The study provides evidence for substantial neurological and psychiatric morbidity following COVID-19 infection. Risks were greatest in, but not limited to, those who had severe COVID-19. The information can help in service planning and identification of research priorities.

<https://www.medrxiv.org/content/10.1101/2021.01.16.21249950v1#:~:text=Findings%20236%2C379%20patients%20survived%20a,receiving%20their%20first%20such%20diagnosis>

**Title: PERSISTENT COVID-19-ASSOCIATED NEUROCOGNITIVE SYMPTOMS IN NON-HOSPITALIZED PATIENTS**

**Source**: Journal of Neurovirology; Feb 2021

Abstract As cases of coronavirus disease 2019 (COVID-19) mount worldwide, attention is needed on potential long-term neurologic impacts for the majority of patients who experience mild to moderate illness managed as outpatients. To date, there has not been discussion of persistent neurocognitive deficits in patients with milder COVID-19. We present two cases of non-hospitalized patients recovering from COVID-19 with persistent neurocognitive symptoms. Commonly used cognitive screens were normal, while more detailed testing revealed working memory and executive functioning deficits. An observational cohort study of individuals recovering from COVID-19 (14 or more days following symptom onset) identified that among the first 100 individuals enrolled, 14 were non-hospitalized patients reporting persistent cognitive issues. These 14 participants had a median age of 39 years (interquartile range: 35-56), and cognitive symptoms were present for at least a median of 98 days (interquartile range: 71-120 following acute COVID-19 symptoms); no participants with follow-up evaluation reported symptom resolution. We discuss potential mechanisms to be explored in future studies, including direct viral effects, indirect consequences of immune activation, and immune dysregulation causing auto-antibody production.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7852463/>

**Title:** **PERSISTENT HYPOKALEMIA POST SARS-COV-2 INFECTION, IS IT A LIFE-LONG COMPLICATION? CASE REPORT**  
Source Annals of Medicine and Surgery (2012); Feb 2021; vol. 62 ; p. 358-361

Introduction and importance SARS-CoV-2 is a novel infection that has affected millions of people around the world. Complications of the infection may affect multiple systems including cardiovascular, neurological, gastrointestinal, urinary, and pulmonary systems. Hypokalemia, which is a life-threatening condition that may lead to arrhythmia and possibly death, has been noticed in more than half of the COVID-19 patients. Further understanding of the disease process and its complications is necessary to guide in preventing the complications from happening in the first place and finding treatment for patients with an already established complications. Case presentation A 34-year old male from Philippines who lives in Saudi Arabia - Riyadh and works as health care provider with no previous history of any medical illness. Presented by himself to the emergency department (ED) with dry cough, shortness of breath, fever, malaise, and fatigability for five days. On examination (RR 25), (T 38.6 °C) and (O2 89% Room air), on auscultation there was a decrease on air entry bilaterally with scattered crepitations, no wheezing or stridor. Covid-19 swab was positive, (Day 1) potassium 2.91 (mmol/L) magnesium (mmol/L) with normal baseline before getting infected. Clinical discussion Patient while in the hospital was on daily potassium oral and IV replacement with IV magnesium replacement. Investigation showed 24Hr urine potassium 47.3 (mmol/L), 24Hr urine magnesium 5.52 (mmol/L), 24Hr urine Creatinine 9.25 (mmol/L), (TTKG) Transtubular Potassium Gradient 18 and (VBG) PH:7.38, Pco2:44 (mmHg) Po2:55 (mmHg) HCO3:25 (mEq/L). Patient has an increased renal potassium loss with normal VBG on separate days and normal Blood pressure that excludes diseases with associated acidemia or alkalemia. Our patient didn't want to go for any invasive diagnostic procedures and favored to wait for spontaneous recovery. Conclusion We followed up the potassium level of our patient for more than 5 months since he was diagnosed with COVID-19 to find out that he is still having hypokalemia, as well as, hypomagnesemia. Long term complications of COVID-19 infection such as hypokalemia and hypomagnesemia need to be observed and followed up closely to avoid life-threatening arrythmias and seizures. The attention of the scientific community to possible long term or permanent complications is needed to help find preventive measures and treatment for patients with complications.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7839393/>

**Title:** **HIGH PREVALENCE OF PULMONARY SEQUELAE AT 3 MONTHS AFTER HOSPITAL DISCHARGE IN MECHANICALLY VENTILATED SURVIVORS OF COVID-19**  
Source: American journal of respiratory and critical care medicine; Feb 2021; vol. 203 (no. 3); p. 371-374

Severe coronavirus disease (COVID-19) is characterized by acute hypoxemic respiratory failure, usually with extensive consolidations and areas with ground glass on chest computed tomographic (CT) scans ([1](https://www.atsjournals.org/doi/full/10.1164/rccm.202010-3823LE)). Whether long-term respiratory sequelae persist in survivors of severe COVID-19 remains to be established. This report describes our findings of respiratory outcomes in mechanically ventilated survivors of COVID-19 at 3 months after hospital discharge.

<https://www.atsjournals.org/doi/full/10.1164/rccm.202010-3823LE>

**Title:** **MUSCLE STRENGTH AND PHYSICAL PERFORMANCE IN PATIENTS WITHOUT PREVIOUS DISABILITIES RECOVERING FROM COVID-19 PNEUMONIA**  
Source: American journal of physical medicine & rehabilitation; Feb 2021; vol. 100 (no. 2); p. 105-109

ABSTRACT In this cross-sectional study, we evaluated skeletal muscle strength and physical performance (1-min sit-to-stand and short physical performance battery tests), dyspnea, fatigue, and single-breath counting at discharge from a post-acute COVID department, in patients recovering from COVID-19 pneumonia who had no locomotor disability before the infection. Quadriceps and biceps were weak in 86% and 73% of the patients, respectively. Maximal voluntary contraction for quadriceps was 18.9 (6.8) kg and for biceps 15.0 (5.5) kg (i.e., 54% and 69% of the predicted normal value, respectively). The number of chair rises in the 1-min sit-to-stand test was 22.1 (7.3 corresponding to 63% of the predicted normal value), whereas the short physical performance battery score was 7.9 (3.3 corresponding to 74% of the predicted normal value). At the end of the 1-min sit-to-stand test, 24% of the patients showed exercise-induced desaturation. The single-breath counting count was 35.4 (12.3) corresponding to 72% that of healthy controls. Mild-to-moderate dyspnea and fatigue were found during activities of daily living (Borg scale score, median value = 0.5 [0-2] and 1 [0-2]) and after the 1-min sit-to-stand (Borg scale score, median value = 3 [2-5] and 1 [0-3]). Significant correlations were observed between muscle strength and physical performance indices (R = 0.31-0.69).The high prevalence of impairment in skeletal muscle strength and physical performance in hospitalized patients recovering from COVID-19 pneumonia without previous locomotor disabilities suggests the need for rehabilitation programs after discharge.

<https://journals.lww.com/ajpmr/Fulltext/2021/02000/Muscle_Strength_and_Physical_Performance_in.1.aspx>

**Title:** **INCIDENCE AND TREATMENT OF ARRHYTHMIAS SECONDARY TO CORONAVIRUS INFECTION IN HUMANS: A SYSTEMATIC REVIEW**

**Source**: European Journal of Clinical Investigation, 2021 Feb;51(2):e13428

Background: The coronavirus disease 2019 (COVID-19) pandemic has affected millions of people worldwide resulting in significant morbidity and mortality. Arrhythmias are prevalent and reportedly, the second most common complication. Several mechanistic pathways are proposed to explain the pro-arrhythmic effects of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. A number of treatment approaches have been trialled, each with its inherent unique challenges. This rapid systematic review aimed to examine the current incidence and available treatment of arrhythmias in COVID-19, as well as barriers to implementation.

Methods: Our search of scientific databases identified relevant published studies from 1 January 2000 until 1 June 2020. We also searched Google Scholar for grey literature. We identified 1729 publications of which 1704 were excluded.

Results: The incidence and nature of arrhythmias in the setting of COVID-19 were poorly documented across studies. The cumulative incidence of arrhythmia across studies of hospitalised patients was 6.9%. Drug-induced long QT syndrome secondary to antimalarial and antimicrobial therapy was a significant contributor to arrhythmia formation, with an incidence of 14.15%. Torsades de pointes (TdP) and sudden cardiac death (SCD) were reported. Treatment strategies aim to minimise this through risk stratification and regular monitoring of corrected QT interval (QTc).

Conclusion: Patients with SARS-CoV-2 are at an increased risk of arrhythmias. Drug therapy is pro-arrhythmogenic and may result in TdP and SCD in these patients. Risk assessment and regular QTc monitoring are imperative for safety during the treatment course. Further studies are needed to guide future decision-making.

<https://pubmed.ncbi.nlm.nih.gov/33043453/>

**Title:** **POTENTIAL MECHANISMS OF SARS-COV-2 ACTION ON MALE GONADAL FUNCTION AND FERTILITY: CURRENT STATUS AND FUTURE PROSPECTS**

**Source**: Andrologia; Feb 2021; vol. 53 (no. 1); p. e13883

Abstract: The novel coronavirus was recognised in December 2019 and caught humanity off guard. The virus employs the angiotensin-converting enzyme 2 (ACE2) receptor for entry into human cells. ACE2 is expressed on different organs, which is raising concern as to whether these organs can be infected by the virus or not. The testis appears to be an organ enriched with levels of ACE2, while the possible mechanisms of involvement of the male reproductive system by SARS-CoV-2 are not fully elucidated. The major focus of the present studies is on the short-term complications of the coronavirus and gains importance on studying the long-term effects, including the possible effects of the virus on the male reproductive system. The aim of this review was to provide new insights into different possible mechanisms of involvement of male gonads with SARS-CoV-2 including investigating the ACE2 axis in testis, hormonal alterations in patients with COVID-19, possible formation of anti-sperm antibodies (ASA) and subsequently immunological infertility as a complication of SARS-CoV-2 infection. Finally, we suggest measuring the sperm DNA fragmentation index (DFI) as a determiner of male fertility impairment in patients with COVID-19 along with other options such as sex-related hormones and semen analysis. Invasion of SARS-CoV-2 to the spermatogonia, Leydig cells and Sertoli cells can lead to sex hormonal alteration and impaired gonadal function. Once infected, changes in ACE2 signalling pathways followed by oxidative stress and inflammation could cause spermatogenesis failure, abnormal sperm motility, DNA fragmentation and male infertility.

<https://pubmed.ncbi.nlm.nih.gov/33108833/>

**Title:** **MATERNAL IMMUNE RESPONSES AND OBSTETRICAL OUTCOMES OF PREGNANT WOMEN WITH COVID-19 AND POSSIBLE HEALTH RISKS OF OFFSPRING**

**Source**: Journal of Reproductive Immunology; Feb 2021; vol. 143 ; p. 103250

Abstract: Coronavirus disease 2019 (COVID-19) pandemic has spread rapidly across the world. The vast majority of patients with COVID-19 manifest mild to moderate symptoms but may progress to severe cases or even mortalities. Young adults of reproductive age are the most affected population by SARS-CoV-2 infection. However, there is no consensus yet if pregnancy contributes to the severity of COVID-19. Initial studies of pregnant women have found that COVID-19 significantly increases the risk of preterm birth, intrauterine growth restriction, and low birth weight, which have been associated with non-communicable diseases in offspring. Besides, maternal viral infections with or without vertical transmission have been allied with neurological and behavioral disorders of the offspring. In this review, obstetrical outcomes of women with COVID-19 and possible risks for their offspring are discussed by reviewing maternal immune responses to COVID-19 based on the current evidence. Structural and systemic follow-up of offspring who are exposed to SARS-CoV-2 in-utero is suggested.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7676367/>

**Title:** **CARDIAC MANIFESTATIONS IN SARS-COV-2-ASSOCIATED MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN: A COMPREHENSIVE REVIEW AND PROPOSED CLINICAL APPROACH**

**Source**: European Journal of Pediatrics; Feb 2021; vol. 180 (no. 2); p. 307-322

Abstract: Initial reports on COVID-19 described children as largely spared from severe manifestations, with only 2-6% of children requiring intensive care treatment. However, since mid-April 2020, clusters of pediatric cases of severe systemic hyperinflammation and shock epidemiologically linked with COVID-19 have been reported. This condition was named as SARS-Cov-2-associated multisystem inflammatory syndrome in children and showed similarities to Kawasaki disease. Here, we present a narrative review of cases reported in literature and we discuss the clinical acute and follow-up management of these patients. Patients with SARS-Cov-2-associated multisystem inflammatory syndrome frequently presented with persistent fever, gastrointestinal symptoms, polymorphic rash, conjunctivitis, and mucosal changes. Elevated inflammatory markers and evidence of cytokine storm were frequently observed. A subset of these patients also presented with hypotension and shock (20-100%) from either acute myocardial dysfunction or systemic hyperinflammation/vasodilation. Coronary artery dilation or aneurysms have been described in 6-24%, and arrhythmias in 7-60%. Cardiac support, immunomodulation, and anticoagulation are the key aspects for the management of the acute phase. Long-term structured follow-up of these patients is required due to the unclear prognosis and risk of progression of cardiac manifestations. Conclusion: Multisystem inflammatory syndrome is a novel syndrome related to SARS-CoV-2 infection. Evidence is still scarce but rapidly emerging in the literature. Cardiac manifestations are frequent, including myocardial and coronary involvement, and need to be carefully identified and monitored over time. What is Known: • Multisystem inflammatory syndrome in children (MIS-C) has been described associated with SARS-CoV-2. What is New: • Patients with MIS-C often present with fever, gastrointestinal symptoms, and shock. • Cardiac involvement is found in a high proportion of these patients, including ventricular dysfunction, coronary artery dilation or aneurysm, and arrhythmias. • Management is based on expert consensus and includes cardiac support, immunomodulatory agents, and anticoagulation. • Long-term follow-up is required due to the unclear prognosis and risk of progression of cardiac manifestation.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7429125/>

**TITLE:** **MULTIPLE NEUROINVASIVE PATHWAYS IN COVID-19**

**Source**: Molecular Neurobiology; Feb 2021; vol. 58 (no. 2); p. 564-575

Abstract: COVID-19 is a highly infectious viral disease caused by the novel coronavirus SARS-CoV-2. While it was initially regarded as a strictly respiratory illness, the impact of COVID-19 on multiple organs is increasingly recognized. The brain is among the targets of COVID-19, and it can be impacted in multiple ways, both directly and indirectly. Direct brain infection by SARS-CoV-2 may occur via axonal transport via the olfactory nerve, eventually infecting the olfactory cortex and other structures in the temporal lobe, and potentially the brain stem. A hematogenous route, which involves viral crossing of blood-brain barrier, is also possible. Secondary mechanisms involve hypoxia due to respiratory failure, as well as aberrant immune response leading to various forms of encephalopathy, white matter damage, and abnormal blood clotting resulting in stroke. Multiple neurological symptoms of COVID-19 have been described. These involve anosmia/ageusia, headaches, seizures, mental confusion and delirium, and coma. There is a growing concern that in a number of patients, long-term or perhaps even permanent cognitive impairment will persist well after the recovery from acute illness. Furthermore, COVID-19 survivors may be at increased risk for developing neurodegenerative diseases years or decades later. Since COVID-19 is a new disease, it will take months or even years to characterize the exact nature, scope, and temporal extent of its long-term neurocognitive sequelae. To that end, rigorous and systematic longitudinal follow-up will be required. For this effort to succeed, appropriate protocols and patient registries should be developed and put in place without delay now.

<https://link.springer.com/article/10.1007/s12035-020-02152-5>

**TITLE: SIX-MONTH FOLLOW-UP CHEST CT FINDINGS AFTER SEVERE COVID-19 PNEUMONIA  
So**urce: Radiology; Jan 2021 ; p. 203153

Abstract: Background Little is known about the long-term lung radiographic changes in convalescent COVID-19 patients, especially the severe cases. Purpose To prospectively assess pulmonary sequelae and explore the risk factors for lung fibrotic-like changes on six-month follow-up chest CT of survivors of severe COVID-19 pneumonia. Materials and Methods 114 patients (80[70%] men; mean age, 54±12 years) were studied prospectively. Initial and follow-up CT scans were obtained on 17±11 days and 175±20 days respectively after symptom onset. Lung changes (opacification, consolidation, reticulation, and fibrotic-like changes) and CT extent scores (score per lobe, 0-5; maximum score, 25) were recorded. Patients were divided into two groups: group#1 presence and group#2 absence of CT evidence of fibrotic-like changes (traction bronchiectasis, parenchymal bands, and/or honeycombing) based on their six-month follow-up CT. Between-group differences were assessed by Fisher's exact test, two-sample t-test or Mann-Whitney U test. Multiple logistic regression analyses were performed to identify the independent predictive factors of fibrotic-like changes. Results On follow-up CT, evidence of fibrotic-like changes was observed in 40/114 (35%) of patients (group#1), while the remaining 74/114 (65%) patients (group#2) showed either complete radiological resolution (43/114, 38%) or residual ground-glass opacification or interstitial thickening (31/114, 27%). Multivariable analysis identified age >50 years (odds ratio [OR]:8.5, 95%CI:1.9-38, p=.01), heart rate >100bpm at admission (OR:5.6, 95%CI:1.1-29, p=.04), duration of in-hospital stay ≥17 days (OR:5.5, 95%CI:1.5-21, p=.01), and acute respiratory distress syndrome (OR:13, 95%CI:3.3-55, p<.001), non-invasive mechanical ventilation (OR:6.3, 95%CI:1.3-30, p=.02) and total CT score ≥18 (OR:4.2, 95%CI:1.2-14, p=.02) on initial CT as independent predictors for lung fibrotic-like changes at 6 months. Conclusions Six-month follow-up CT showed lung fibrotic-like changes in more than one-third of patients who survived severe COVID-19 pneumonia. These changes were associated with an older age, acute respiratory distress syndrome, longer in-hospital stays, tachycardia, non-invasive mechanical ventilation and higher initial chest CT score. See also the editorial by Wells, Devaraj, and Desai

<https://pubs.rsna.org/doi/full/10.1148/radiol.2021203153#:~:text=In%20summary%2C%20follow%2Dup%20CT,disease%20during%20the%20acute%20phase>.

**TITLE: FOLLOW-UP SERVICES FOR DELIRIUM AFTER COVID-19-WHERE NOW?**  
Source: Age and ageing; Jan 2021

Abstract: Delirium is a common presentation in older inpatients with COVID-19, and a risk factor for cognitive decline at discharge. The glaring gaps in the service provision in delirium care, regardless of aetiology, after a hospital admission pre-existed the pandemic, but the pandemic arguably offers an opportunity now to address them. Whilst a delirium episode in itself is not a long-term condition, the context of it may well be, and therefore patients might benefit from personalised care and support planning. There is no reason to believe that the delirium following COVID-19 is fundamentally different from any other delirium. We propose that the needs of older patients who have experienced delirium including from COVID-19 could be addressed through a new model of post-acute delirium care that combines early supported discharge, including discharge-to-assess, with community-based follow-up to assess for persistent delirium and early new long-term cognitive impairment. Such a drive could be structurally integrated with existing memory clinic services. To succeed, such an ambition has to be both flexible, adaptable and person-centred. To understand the impact on resource and service utilisation, techniques of quality improvement should be implemented, and appropriate metrics reflecting both process and outcome will be essential to underpin robust and sustainable business cases to support implementation of delirium care as a long-term solution.

<https://academic.oup.com/ageing/advance-article/doi/10.1093/ageing/afab014/6106229>

**TITLE: CONSIDERING THE LONG-TERM RESPIRATORY EFFECTS OF COVID-19**  
Source: Occupational Medicine (Oxford, England); Jan 2021

The Covid-19 pandemic arrived in Western Europe in the early spring of 2020. It has had a devastating effect on almost every aspect of our lives. There have been immediate impacts on those most affected with significant loss of life and prolonged periods of illness. So many families are unable to be with loved ones and the immediate effect of their loss can be seen in those most affected. The virus has significant ramifications on all aspects of our society which will continue for the foreseeable future. The consequences for societal norms, career and employment opportunities, both physical and mental health remain have yet to fully unfold.

<https://academic.oup.com/occmed/advance-article/doi/10.1093/occmed/kqaa224/6105804>

**news & local SERVICE DEVelopments**

**TITLE: ONLINE PEER SUPPORT MEETING FOR OUR RECOVERING ICU COVID PATIENTS**

Source: Fiona Hall, Senior ICU nurse at GICU University Hospitals Southampton, UK. Lead for ICU follow up, patient experience team and post ICU peer support.   
  
‘Tonight we held another online peer support meeting for our recovering ICU covid patients. Those from the first surge are now truly offering empathy, practical advice and support to those recently discharged’.  
<https://twitter.com/followupfi/status/1356710238779547648>

**TITLE: NHS LAUNCHES NEW SERVICE TO HELP PATIENTS SUFFERING WITH LONG COVID**

Source: Southern Health NHS Trust, 20th Jan 2021

Southern Health NHS Foundation Trust and its partners Solent NHS Trust and Isle of Wight NHS Foundation Trust have opened a number of clinics across Hampshire and Isle of Wight to help patients suffering from the effects of Long COVID.  The new service is part of a 10 million pound initiative by NHS England who are funding 69 clinics across the country.

This vital service has been launched following emerging evidence that reveals a growing number of people who contract COVID-19, cannot shake off effects of the virus months after initially falling ill.  The symptoms of long COVID are wide-ranging and fluctuating and can include pain, breathlessness, chronic fatigue, brain fog, anxiety and stress. However, many patients recover with support, rest, symptomatic treatment, and with a gradual increase in physical activity.

<https://www.southernhealth.nhs.uk/about/news/long-covid-service/>

**TITLE: SCIENTISTS LIKEN LONG COVID SYMPTOMS TO THOSE OF EBOLA SURVIVORS**

Source: The Guardian, 28th Jan 2021

Scientists are studying the similarities between long Covid and ongoing symptoms experienced by survivors of Ebola and Chikungunya virus in the hope of devising new treatments to improve their health. Like patients with long Covid, survivors of these other, relatively new human viruses, often experience lingering symptoms which can make it difficult to work or function in everyday life.

For Ebola, roughly three-quarters of survivors are still experiencing symptoms a year after the initial infection, and sometimes for much longer – including joint and muscle pain, migraine-like headaches, visual problems and fatigue.

It’s a similar story for Chikungunya, a mosquito-transmitted virus that mostly affects people in African and Asian countries, causing fever and debilitating joint pain. Around a third of people go on to develop crippling arthritis that can last years, or other symptoms such as fatigue.

<https://www.theguardian.com/society/2021/jan/28/scientists-liken-long-covid-symptoms-to-those-of-ebola-survivors>

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[TRFT Library & Knowledge Service](https://www.trftlibraryknowledge.com/) aim to bring together the latest guidelines, research and news on Covid-19 through our [Covid-19 portal](https://www.trftlibraryknowledge.com/coronavirus.html). For daily updates on Covid-19 visit our '[Latest Health](https://trfthealthweeklydigest.wordpress.com/)' newsfeed, or use the hashtag [#covid19rftlks](https://twitter.com/hashtag/covid19rftlks?src=hashtag_click) to see our latest tweets on Covid-19 research, guidelines and news.

We also produce a range of subject-specific news feeds to ensure our clinical and professional teams stay up to date with developments in their work areas. Please visit our [website](http://www.trftlibraryknowledge.com/) for more information

<https://www.trftlibraryknowledge.com/health-newsfeeds.html>