April 23, 2020
Daily COVID-19 Literature Surveillance Summary

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This free and open source document represents a good faith effort to provide real time, distilled information for guiding best practices during the COVID-19 pandemic. This document is not intended to and cannot replace the original source documents and clinical decision making. These sources are explicitly cited for purposes of reference but do not imply endorsement, approval or validation.

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Coming soon:

COVID-19 Daily Literature Surveillance

COVID19LST

Bringing you real time, distilled information for guiding best practices during the COVID-19 pandemic

The Swab

Jasmine Rah

The untold stories of the coronavirus (COVID-19) pandemic.

April 23, 2020
Executive Summary

Climate

- Accumulating evidence suggest that many COVID-19 like viruses may be circulating among wild animals
    - With factors like deforestation and climate change increasing human-animal contact, chances of more pandemics are high and preparedness is key
- Persons with opioid use disorders face unique barriers to treatment such as restrictions on take home doses, requirements for in-person visits and physicals, and lack of group support sessions
    - There is a need to re-evaluate current regulations to best support this vulnerable population

Epidemiology

- One study analyzed over 62,000 cases in Italy and found the crude case fatality rate was 8.8%, which is significantly higher than that observed in other countries.
- A meta-analysis of 38 studies, including over 3,000 COVID-19 patients, found the most common symptoms of COVID-19 to be fever, fatigue, cough, and expectoration.
    - ARDS or respiratory failure was present in 19.5% of patients and the fatality rate was 5.5%.

Understanding the Pathology

- Two papers attempt to explain the association between obesity and COVID-19 severity
    - They note that the ACE2 receptor have also been known to be implicated in the pathophysiology of obesity through increased production of pro-inflammatory cytokines, such as IL-6
- One study also found that the most common cutaneous presentation of COVID-19 is an erythematous rash, reminiscent of varicella.
    - Other presentations included urticaria, a dengue like rash, as well as papules and vesicles.

Transmission & Prevention

- One author wrote copper nanocomposites are an effective antimicrobial polymer and can be used to manufactur medical devices.
- A cross-sectional study of over 10,000 frontline healthcare workers in Singapore found that an enhanced medical surveillance and protection system was effective in preventing illness or transmission

Management

- COVID-19 patients with hemoptysis should be evaluated for pulmonary embolism as growing evidence suggests that these patients are prone to coagulopathies.
- A study of over 200 intubations in COVID-19 patients found that use of 2 layers of gowning, a face shield, and a PAPR hood effectively eliminated inhospital infections of hospital employees involved in intubations.

- Canadian anesthesiologists put forth a method to reduce droplet and aerosol production during transesophageal echocardiography
- As the use of hydroxychloroquine in COVID-19 patients grows, more case reports highlight hepatotoxicity as a rare, but serious side effect.

Adjusting Practice during COVID-19

- Several guidelines, that can be found at covid19lst.org, have come out with regard to:
  - Burn care
  - Telemedicine for family members of the critically ill
  - Preventing transmission in radiology departments
  - Triaging neurosurgical cases
  - Prevention and control strategies for cancer patients
  - Reducing medical error when operating during the pandemic
- Experts in the American Association of Cancer Research (AACR) discuss two research projects that suggest higher incidence and severity of COVID-19 in cancer patients

R&D: Diagnosis & Treatments

- In current diagnostics
  - A meta analysis of over 4,000 COVID patients found the most common CT features to be:
    - bilateral lung involvement: found in over 70% of patients,
    - multilobar involvement: found in 67%,
    - and ground glass opacities: found in 68%.
  - Less common features included
    - Pleural thickening in 27% and consolidation in 32%.

Mental Health & Resilience

- There is an urge for governments and policy makers to create awareness about increased risk of family violence during pandemics, highlighting the need for all of us to maintain an open channel of communication with those who may be experiencing intimate partner violence and encourage safety at this time.
- Crisis can be an opportunity for change and COVID-19 presents an opportunity for gender equality at the workplace and home
  - As more and more employers begin to recognize the disproportionate burden of work women carry in terms of employment and childcare

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Chest CT in patients suspected of COVID-19 infection: A reliable alternative for RT-PCR

Levels of Evidence

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or *n*-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or *n*-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non -randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

*** Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.**

**** As always, a systematic review is generally better than an individual study.**

Credit: OCEBM Levels of Evidence Working Group*. "The Oxford 2011 Levels of Evidence". Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=5653

Climate

A Brave New World: Lessons from the COVID-19 Pandemic for Transitioning to Sustainable Supply and Production.

Sarkis J, Cohen MJ, Dewick P, Schröder P.
Resour Conserv Recycl
2020 Apr 17; PMID: 32313383
Level of Evidence: 5 - Expert Opinion
Type of Article: Perspective

Summary: The months following the pandemic will provide a rare opportunity to make large-scale changes towards more sustainable society. The authors support continuing plans to work from home, improving and implementing local production systems, decentralizing manufacturing, and enhancing data management.

Public Health and COVID-19: From Response to Recovery.

James JJ.James JJ.
Disaster Med Public Health Prep.
2020 Apr 21; PMID: 32314953
Level of Evidence: 5 - Expert opinion
Type of Article: Commentary

BLUF: The author suggests that "less drastic [social distancing] measures may [be as efficacious] with fewer negative socio-economic impacts". He expresses **concerns about increases in alcohol use and domestic violence** and worries a current 'overreaction' **may impair an appropriate response to new "disasters"** in the future.

Summary:
COVID-19 may provide an important opportunity to implement positive social policies. The author argues that we must not simply revert back to the way things were, but instead invest in an environmentally sustainable future through thoughtful action. **These include continued work from home policies, decentralized/local logistics systems** and implementation of AI to further minimize travel. **Enhanced data management could also be implemented to prevent future supply chain crises.**

COVID-19 and the policy sciences: initial reactions and perspectives.

Weible CM, Nohrstedt D, Cairney P, Carter DP, Crow DA, Durnová AP, Heikkila T, Ingold K, McConnell A, Stone D.
Policy Sci
2020 Apr 18, PMID: 32313308
Level of Evidence: 5 - Expert Opinion
Article Type: Commentary

BLUF: Following the COVID-19 pandemic, policies regarding travel, communication, and emergency preparedness during a time of crisis require re-evaluation and implementation of new policies based on the lessons learned from the current pandemic.

Abstract:
The world is in the grip of a crisis that stands unprecedented in living memory. The COVID-19 pandemic is urgent, global in scale, and massive in impacts. Following Harold D. Lasswell's goal for the policy sciences to offer insights into unfolding phenomena, this commentary draws on the lessons

of the policy sciences literature to understand the dynamics related to COVID-19. We explore the ways in which scientific and technical expertise, emotions, and narratives influence policy decisions and shape relationships among citizens, organizations, and governments. We discuss varied processes of adaptation and change, including **learning, surges in policy responses, alterations in networks (locally and globally), implementing policies across transboundary issues, and assessing policy success and failure.** We conclude by identifying understudied aspects of the policy sciences that deserve attention in the pandemic's aftermath.

COVID-19: A new digital dawn?

Robbins T, Hudson S, Ray P, Sankar S, Patel K, Randeva H, Arvanitis TN.
Digit Health
2020 Apr 11, PMID: 32313668
Level of Evidence: 5 - Expert Opinion
Article Type: Editorial
Summarizing Excerpt: "The COVID-19 pandemic will have wide-ranging impacts across healthcare, the economy and society as a whole. The human costs of the disease will unfortunately be very high and long remembered. Despite this, through such adversity, the healthcare system that works to protect us may become stronger and more robust. A central foundation of this change will be the development and implementation of new ways of remote and digital health working."

Nutrition amid the COVID-19 pandemic: a multi-level framework for action.

Naja F, Hamadeh R
Eur J Clin Nutr.
2020 Apr 20; PMID: 32313188
Level of Evidence: 5 - Expert opinion
Type of Article: Review
Summarizing Excerpt: “Since the outbreak, networks of social media were flooded by messages of single foods/herbs promising cure or prevention of the infection. The effects of such unfounded claims could lead to negative implications ranging from giving a false sense of protection against the infection to toxicity.”

Participant and Caregiver Perspectives on Clinical Research During COVID-19 Pandemic

Padala, Prasad R; Jendro, Ashlyn M; Gauss, C Heath; Orr, Lillian C; Dean, Kim T; Wilson, Kerrie B; Parkes, Christopher M; Padala, Kalpana P
J Am Geriatr Soc
2020 Apr 21; PMID: 32315076
Level of Evidence: 4 - Cohort study
Type of Article: Research
BLUF: This study shows participants are equally inclined to partake in-person or remote interviews when participating in clinical research during the COVID-19 pandemic Their major sources of information about the pandemic were from family members or television news media.

Abstract:
Background/objectives: The COVID-19 pandemic has massively disrupted essential clinical research. Many regulatory organizations have rightfully advocated to temporarily halt enrollment and curtail all face-to-face interactions. Views and opinions of patients and their caregivers are seldom considered

while making such decisions. The objective was to study older participants' and their caregivers' perspectives to participate in ongoing clinical research during the COVID-19 pandemic.
Design: Cross-sectional SETTING: VISN-16/Geriatric Research Education and Clinical Center (GRECC), Department of Veterans Affairs.
Participants: Older participants and their caregivers (N=51) enrolled in ongoing clinical research studies.
Measurements: Questions about perceptions of safety to attend research visit, the level of panic among the general public, and medical center's preparedness in handling the pandemic. Other questions identified the source of pandemic information and the preference of a phone or in-person visit.
Results: Mean age was 69.3 (±9.4) years, 53% were male, 39% were caregivers, and 65% were Caucasian. Majority (78%) of the participants felt safe/very safe attending the scheduled research appointment; 63% felt that the extra screening made them feel safe/very safe; 82% felt that the medical center was prepared/very prepared for the pandemic. Participants split evenly on their preference for phone vs. in-person visits. Family members and television news media were the commonly used sources of pandemic information irrespective of their education. Perceptions were influenced by gender and source of information, not by age or education. Females perceived higher level of panic compared to males (p=0.02). Those relying on news media felt safer compared to those that relied on family members (p=0.008).
Conclusion: Even though informants felt that the medical center was prepared to handle the pandemic, only half the participants preferred the in-person visit. Pandemic information was obtained from family members or the television news media. Knowing patients' perspectives may help researchers be better prepared for future pandemics.

COVID-19 travel restrictions and the International Health Regulations - call for an open debate on easing of travel restrictions.

Petersen E, McCloskey B, Hui DS, Kock R, Ntoumi F, Memish ZA, Kapata N, Azhar EI, Pollack M, Madoff LC, Hamer DH, Nachega JB, Pshenichnaya N, Zumla A.Petersen E, et al.
Int J Infect Dis.
2020 Apr 16; PMID: 32305518
Level of Evidence: 5- Expert Opinion
Type of Article: Editorial
BLUF: A collective discussion on how to begin lifting of global travel restrictions. They state with certainty that proactive, ongoing surveillance is required as well as the continued search for effective serologic testing, treatments and vaccines from COVID-19.

Summary: Apart from social distancing, **global travel restrictions were recommended by the World Health Organization** because they deemed the public health impact of COVID-19 to be serious, unusual/unexpected with a significant risk of international spread. However, the non-scientific community seems to disagree across the globe, leaving many scholars apprehensive.

COVID-19, Postacute Care Preparedness, and Nursing Homes

Gurwitz, Jerry
J Am Geriatr Soc
2020 Apr 21; PMID: 32315075
Level of Evidence: 6 - Editorial
Type of Article: Editorial
Summary: This article focuses on the recent decisions made by the governor of Massachusetts (MA) to create COVID-19 designated long term care facilities, in turn displacing a large number of

residents. The author urges caution on moving elderly residents during times of emergencies and instead encourages preparing these long term facilities for COVID-19 outbreaks.

Barriers and facilitators to healthcare workers' adherence with infection prevention and control (IPC) guidelines for respiratory infectious diseases: a rapid qualitative evidence synthesis.

Houghton C, Meskell P, Delaney H, Smalle M, Glenton C, Booth A, Chan XHS, Devane D, Biesty LM
Cochrane Database Syst Rev
2020 Apr 21; PMID: 32315451
Level of Evidence: 4 - Review of qualitative studies
Type of Article: Rapid review

Summary excerpt: "Healthcare workers point to several factors that influence their ability and willingness to follow IPC guidelines when managing respiratory infectious diseases. These include factors tied to the guideline itself and how it is communicated, support from managers, workplace culture, training, physical space, access to and trust in personal protective equipment, and a desire to deliver good patient care. The review also highlights the importance of including all facility staff, including support staff, when implementing IPC guidelines."

Report from the COVID-19 Virtual Summit, *Disaster Experts Speak Out*, March 31, 2020.

Phillips JP, Ragazzoni L, Burel WG, Burkle FM, Keim M.
Prehosp Disaster Med
2020 Apr 21, PMID: 32312355
Level of Evidence: 5 - Expert Opinion
Article Type: Webinar transcript

BLUF: The webinar highlighted the need for proper protective equipment and the failure in response from the President and the World Health Organization.

Abstract: This article captures the webinar narrative on March 31, 2020 of four expert panelists addressing three questions on the current coronavirus disease 2019 (COVID-19) pandemic. Each panelist was selected for their unique personal expertise, ranging from front-line emergency physicians in multiple countries, an international media personality, former director of the US Strategic National Stockpile, and one of the foremost international experts in disaster medicine and public policy. The forum was moderated by one of the most widely recognized disaster medical experts in the world. The four panelists were asked three questions regarding the current pandemic as follows:1. What do you see as a particular issue of concern during the current pandemic?. What do you see as a particular strength during the current pandemic?. If you could change one thing about the way that the pandemic response is occurring, what would you change?

COVID-19 Epidemic and Enhancing China's National Biosecurity System.

Wang X.
J Biosaf Biosecur. 2020.
2020 Apr 17; PMID: 32313877
Level of Evidence: 5 - Expert Opinion
Type of Article: Commentary

Summary:
The COVID-19 epidemic will have a long-term impact on China's capacity-building and biosecurity system for public health emergencies. In response to the outbreak, the author states there is a need

for enactment of increased laws and regulations, reorganization of response structure, and a more effective distribution of medical countermeasures, among other measures. In addition, there is a great need for international cooperation to safeguard global biosecurity.

Zoonotic origins of human coronavirus 2019 (HCoV-19): why is this work important?

Wong G, Bi YH, Wang QH, Chen XW, Zhang ZG, Yao YG.
Zoological Research
2020 Apr 21; PMID: 32314559
Level of Evidence: 5 - Expert opinion
Type of Article: Editorial

BLUF: This article discusses the accumulation of evidence suggesting that many COVID-19-like viruses may be circulating among wild animals. With factors such as deforestation and climate change increasing the frequency of human-animal close contact, the chances of another, similar pandemic are high and pandemic preparedness is more important now than ever.

Abstract: The ongoing pandemic of coronavirus disease 2019 (COVID-19), caused by infection with human coronavirus 2019 (HCoV-19 / SARS-CoV-2 / 2019-nCoV), is a global threat to the human population. Here, we briefly summarize the available data for the zoonotic origins of HCoV-19, with reference to the other two epidemics of highly virulent coronaviruses, SARS-CoV and MERS-CoV, which cause severe pneumonia in humans. We propose to intensify future efforts for tracing the origins of HCoV-19, which is a very important scientific question for the control and prevention of the pandemic.

Chinese Public Attention to COVID-19 Epidemic: Based on Social Media.

Zhao Y, Cheng S, Yu X, Xu H.Zhao Y, et al.
J Med Internet Res.
2020 Apr 20; PMID: 32314976
Level of Evidence: 5 - Mechanism-based reasoning
Article type: Research

Summary: The authors analyze public attention toward COVID-19 related events in China from Dec. 31, 2019 to Feb 20, 2020 through the Sina Microblog, a social media platform. They analyze “hot searches” and evaluate trends in social media posts. They find that the public was most concerned with the following topics:

- The situation of the new cases of COVID-19 and its impact
- Frontline reporting of the epidemic and the measures of prevention and control
- Fxpert interpretation and discussion on the source of infection
- Medical services on the frontline of the epidemic
- Focus on the global epidemic and the search for suspected cases

Disparities

The Pandemic of Hate Is Giving Novel Coronavirus Disease (COVID-19) a Helping Hand.

Ng E.
Am J Trop Med Hyg.
2020 Apr 20.; PMID: 32314701
Level of Evidence: 5 - No evidence provided

Article type: Commentary
Summary: The author of this letter discusses the increase in hate and racism toward the Chinese in London. He reports events from the UK where Chinese individuals have been verbally abused byfrom individuals including children andto doctors. He shares similar events that have occurred worldwide toward individuals of Chinese origin. He urges that we deny stigma and racism in an effort to collectively resolve and defeat COVID-19.

Opioid use disorder and the COVID 19 pandemic: A call to sustain regulatory easements and further expand access to treatment.

Green TC, Bratberg J, Finnell DS
Subst Abus
2020; PMID: 32314951
Level of Evidence: 5 - Expert Opinion
Type of Article: Editorial
BLUF: Receiving treatment for opioid use disorder is especially burdensome during this pandemic. These include the restrictions on take home doses, the requirements for in person visits and physicals, and the central role of group support sessions. The authors call for a close examination of current regulations to better support this vulnerable population. They propose increasing the availability of treatment by decreasing or eliminating required prescriber training courses and propose taking advantage of the network of pharmacists and pharmacies already in place to dispense methadone and buprenorphine.

Abstract:
We highlight the critical roles that pharmacists have related to sustaining and advancing the changes being made in the face of the current COVID-19 pandemic to ensure that patients have more seamless and less complex access to treatment. Discussed herein is how the current COVID-19 pandemic is impacting persons with substance use disorders, barriers that persist, and the opportunities that arise as regulations around treatments for this population are eased.

Preparing for COVID-19's aftermath: simple steps to address social determinants of health.

Jani A.
J R Soc Med.
2020 Apr 21; PMID: 32314660
Level of Evidence: 5 - Expert opinion
Article type: Letter
Summary:
Drawing from the 2008 global financial collapse, the author **predicts a large increase in social and health needs** including worsening living standards, well-being reductions, decreased educational achievement, increased rates of suicide and increase in poor mental health, many of which will stem from unemployment. All of these social and health needs will likely precipitate an increase in inequalities and social fragmentation. The following actions are suggested to mitigate negative health impacts: **active labour market programs; family support programs; control of alcohol prices and availability; primary care people at high risk of mental health problems; debt relief programs; training for healthcare professionals to discuss patients' finances and provide information on benefits; and coordinated responses across health, social and financial services** to facilitate early interventions for at-risk population.

After the COVID-19 Pandemic: The Next Wave of Health Challenges for Older Adults.

Schrack JA, Wanigatunga AA, Juraschek SP.Schrack JA, et al.
J Gerontol A Biol Sci Med Sci.
2020 Apr 21; PMID: 32315025
Level of Evidence: 5 - Expert opinion
Type of Article: Commentary
Summary: The author discusses **geriatric health in the post COVID-19 era** and factors that may disproportionately affect older adults. Issues discussed include **lack of adequate exercise, isolation, unique financial and health-related stressors, access to nutrition, and limited access to providers for health care.** Mitigating these factors may require new innovations in monitoring health and providing care.

Epidemiology

Global

Epidemiological trends of COVID-19 epidemic in Italy during March 2020. From 1,000 to 100,000 cases.

La Maestra S, Abbondandolo A, De Flora S.La Maestra S, et al.
J Med Virol.
2020 Apr 21; PMID: 32314804
Level of Evidence: 2 - Systematic review of surveys that allow matching to local circumstances
Type of Article: Research

BLUF: Of 62,843 cases of COVID-19 analysed in Italy, R0 was estimated to be in the range of 2.13-3.33 in different regions, with a doubling time estimated between 2.7 and 3.2 days. Age and male sex were independent risk factors. Crude case fatality rate was 8.8%, which is higher than that observed in other countries.

Abstract:
Background: In February 2020, a locally-acquired COVID-19 case was detected in Lombardia, Italy. This was the first signal of ongoing transmission of SARS-CoV-2 in the country. The outbreak rapidly escalated to a national level epidemic, amid the WHO declaration of a pandemic.
Methods: We analysed data from the national case-based integrated surveillance system of all RT-PCR confirmed COVID-19 infections as of March 24th 2020, collected from all Italian regions and autonomous provinces. Here we provide a **descriptive epidemiological summary on the first 62,843 COVID-19 cases in Italy as well as estimates of the basic and net reproductive numbers by region**.
Findings:Of the 62,843 cases of COVID-19 analysed, 71·6% were reported from three Regions (Lombardia, Veneto and Emilia-Romagna). All cases reported after February 20th were locally acquired. **Estimates of R0 varied between 2·5 (95%CI: 2·18-2·83) in Toscana and 3 (95%CI: 2·68-3·33) in Lazio, with epidemic doubling time of 3·2 days (95%CI: 2·3-5·2) and 2.9 days (95%CI: 2·2-4·3), respectively**. The net reproduction number showed a decreasing trend starting around February 20-25, 2020 in Northern regions. Notably, 5,760 cases were reported among health care workers. Of the 5,541 reported COVID-19 associated deaths, 49% occurred in people aged 80 years or above with an **overall crude CFR of 8·8%**. **Male sex and age were independent risk factors for COVID-19 death.**
Interpretation: The COVID-19 infection in Italy emerged with a clustering onset similar to the one described in Wuhan, China and likewise showed worse outcomes in older males with comorbidities. Initial R0 at 2·96 in Lombardia, explains the high case-load and rapid geographical spread observed. Overall Rt in Italian regions is currently decreasing albeit with large diversities across the country, supporting the importance of combined non-pharmacological control measures.
Funding: routine institutional funding was used to perform this work.

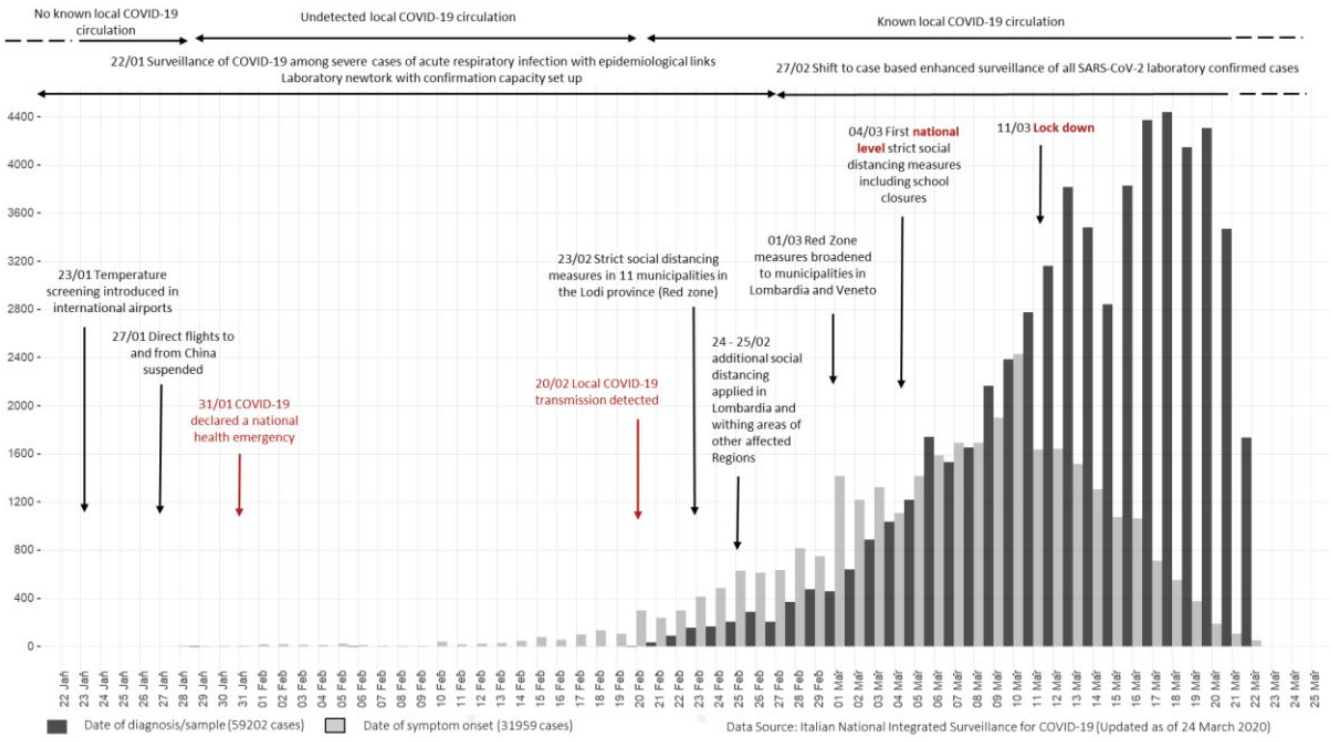


Figure 1 – Epidemiological curves of COVID-19 cases by date of onset (blue) and date of diagnosis (green), Italy 22 January – 24 March 2020

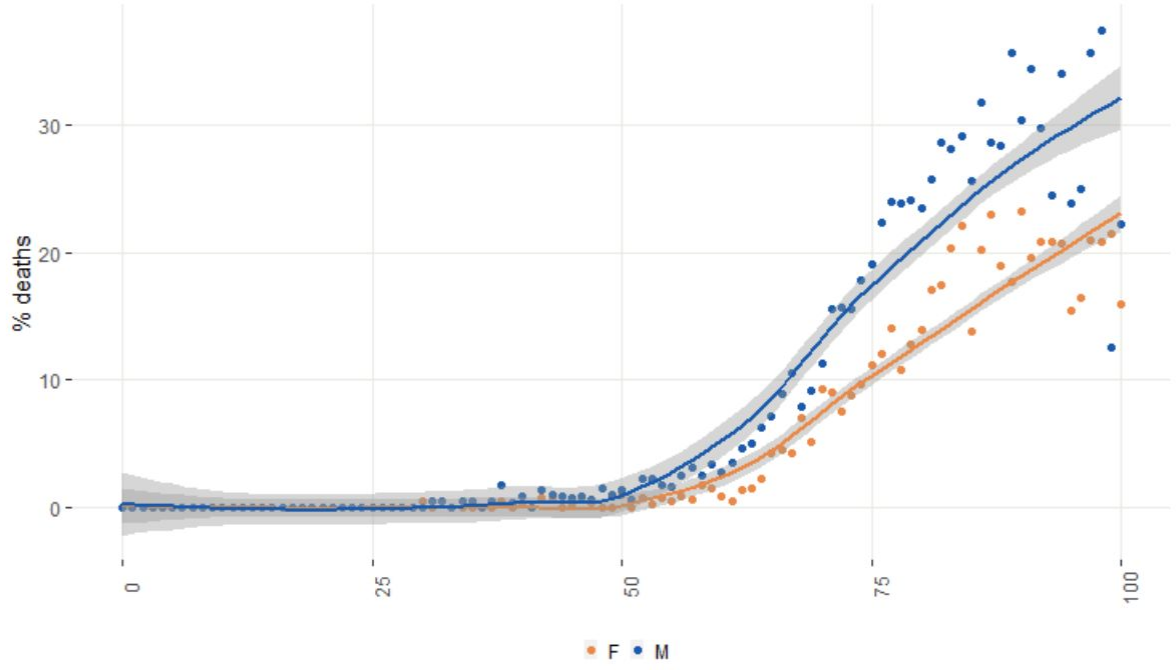


Figure 5 - Case fatality rate by age at diagnosis and sex (dots (blue for males, reds for females) represent rates by single age, locally weighted regression curves (band width=0.8) show the estimated trend.

Understanding Evolution of SARS-CoV-2: A Perspective From Analysis of Genetic Diversity of RdRp Gene.

Kasibhatla SM, Kinikar M, Limaye S, Kale MM, Kulkarni-Kale U.
J Med Virol
2020 Apr 21; PMID: 32314811
Level of Evidence: 5- Basic research
Type of Article: Research

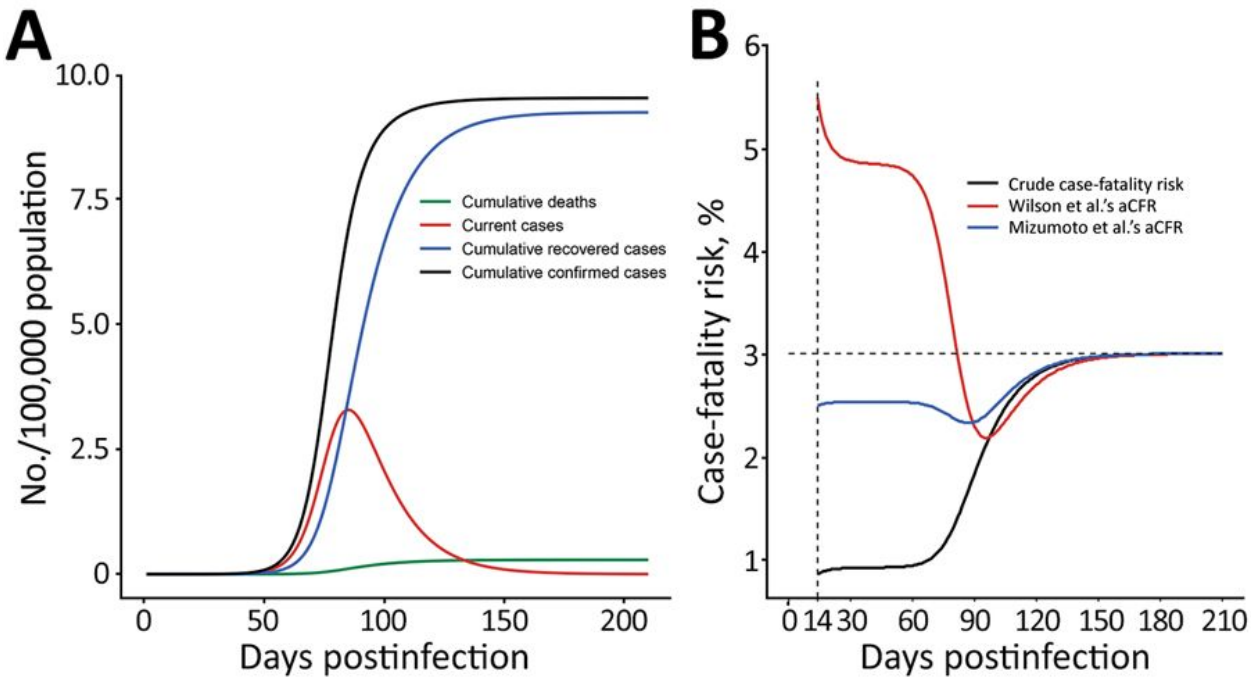
BLUF: Here the authors perform multiple sequence alignments of the RNA dependent RNA polymerase (RdRp) genes of SARS-CoV-2 and other members of the *Betacoronavirus* genus. This provides more information about the evolution of SARS-CoV-2 and its likely origin from bats.

Abstract:
BACKGROUND & OBJECTIVES: COVID-19 emerged as the first example of "Disease X", a hypothetical disease of humans caused by an unknown infectious agent that was named as novel coronavirus and subsequently designated as SARS-CoV-2. The origin of the outbreak at the animal market in Wuhan, China implies it as a case of zoonotic spillover. **The study was designed to understand evolution of Betacoronaviruses and in particular diversification of SARS-CoV-2 using RdRp gene, a stable genetic marker.**
METHODS:Phylogenetic and population stratification analyses were carried out using Maximum likelihood and Bayesian methods, respectively.
RESULTS:Molecular phylogeny using RdRp, showed that SARS-CoV-2 isolates cluster together. Bat-CoV isolate RaTG13 and Pangolin-CoVs are observed to branch off prior to SARS-CoV-2 cluster. While SARS-CoV form a single cluster, Bat-CoVs form multiple clusters. Population-based analyses revealed that both SARS-CoV-2 and SARS-CoV form separate clusters with no admixture. Bat-CoVs were found to have single and mixed ancestry and clustered as four sub-populations.
CONCLUSIONS: Population-based analyses of Betacoronaviruses using RdRp, revealed that SARS-CoV-2 is a homogeneous population. SARS-CoV-2 appears to have evolved from Bat-CoV isolate RaTG13, which diversified from a common ancestor from which Pangolin-CoVs have also evolved. The admixed Bat-CoV sub-populations indicate that bats serve as reservoirs harboring virus ensembles that are responsible for zoonotic spillovers such as SARS-CoV and SARS-CoV-2. The extent of admixed isolates of Bat-CoVs observed in population diversification studies underline the need for periodic surveillance of bats and other animal reservoirs for potential spillovers as a measure towards preparedness for emergence of zoonosis.

Estimation of Coronavirus Disease Case-Fatality Risk in Real Time.

Ge Y, Sun S.
Emerg Infect Dis.
2020 Apr 21; PMID: 32315282
Level of Evidence: 4 - Case series
Type of Article: Research

Summary: The authors ran a simulation comparing 3 methods to calculate case-fatality risk for COVID-19 using parameters described in current literature. Through comparison of the simulation projections (crude case fatality risk, Wilson et al. method, and Mizumoto et al. method) to the true aCFR (adjusted case-fatality risk), **the authors recommend the Mizumoto et al. method to calculate aCFR in real time.**



Sex- And Gender-specific Observations and Implications for COVID-19.

Walter LA, McGregor AJ.
West J Emerg Med
2020 Apr 10; PMID: 32302282
Level of Evidence: 5 – Expert Opinion
Type of Article: Editorial

BLUF: The authors utilize a sex- and gender-based medicine approach to assess potential reasons why initial data suggests that men have been disproportionately affected by COVID-19 worldwide. The reasons include sex-based differences in immunity and ACE2 activity and gender-based differences in smoking rates, healthcare seeking behaviors, and engaging in health-related risks.

Summary: The authors review sex-specific and gender-specific factors that may be impacting the epidemiology of COVID-19, which data from several countries suggests may have a higher incidence and case-mortality rate in men. Relevant sex-specific factors include the high number of immune genes on the X chromosome and the potential role testosterone may play in increasing ACE2 activity. Gender-specific factors include higher smoking rates in men, women typically being more focused on their own healthcare and the healthcare of others as a result of their caregiving role, and men's higher tendency to engage in health-related risks. The authors call for other researchers to consider the potential roles of sex and gender in when developing management plans for patients and performing research on COVID-19.

Changes in Subway Ridership in Response to COVID-19 in Seoul, South Korea: Implications for Social Distancing.

Park J.Park J.
Cureus
2020 Apr 12; PMID: 32313784
Level of Evidence: 4 - Epidemiology
Type of Article: Research

BLUF: "The number of subway passengers in Seoul decreased markedly during late February but slowly increased afterward, suggesting decreasing levels of risk perception and adherence to social distancing. Understanding the differing patterns of subway use by age or purpose of the visit may guide policymakers and the general public in shaping their future response to the current pandemic."

Abstract:
Introduction: While numerous episodes of Coronavirus disease 2019 (COVID-19) infection and subsequent government announcements in South Korea were accompanied by widespread social distancing efforts by the people, it is unclear whether these episodes and government announcements were actually influential in improving social distancing, or whether the level of response among different demographic groups varied.
Methods: Data were downloaded from Seoul Data Open Plaza, and changes in the number of passengers on the Seoul Metropolitan Subway network between January 1, 2020, and March 31, 2020, were used to assess the extent to which people in Seoul practiced social distancing. **Five events regarding COVID-19 that received wide public attention between January and March 2020 were identified and the changes in the number of passengers before and after each event were analyzed.** Also, similar analyses were performed for 16 stations that were specific in either the age or purpose of the visit of the passengers.
Results: Compared to the third week of January 2020 (January 13-19), **the mean daily number of passengers in all stations decreased by 2,984,857.4 or 40.6% by the first week of March (March 2-8). The percentage decrease in individual stations between this period was not significantly different between "young" and "old" stations (46.3% vs. 49.2%; p = 0.551) but was significantly smaller in "work" stations than in "leisure" stations (36.2% vs. 51.6%; p = 0.021).** Of the five events, the first reported death due to COVID-19 in South Korea and the identification of a mass infection cluster in Daegu on February 20 were accompanied by the greatest decrease of the mean daily number of passengers (1,352,153.3 or 20.8%), while the first mass infection in Seoul on March 10 and the announcement of aggressive social distancing campaign on March 22 were accompanied by an increase in the number of passengers.
Conclusions: The number of subway passengers in Seoul decreased markedly during late February but slowly increased afterward, suggesting decreasing levels of risk perception and adherence to social distancing. Understanding the differing patterns of subway use by age or purpose of the visit may guide policymakers and the general public in shaping their future response to the current pandemic.

Symptoms and Clinical Presentation

Clinical Characteristics of 3,062 COVID-19 Patients: a Meta-Analysis

Zhu J, Ji P, Pang J, Zhong Z, Li H, He C, Zhang J, Zhao C.Zhu J, et al.
J Med Virol
2020 Apr 15; PMID: 32293716
Level of Evidence: 2 - Meta Analysis
Type of Article: Research

BLUF: A meta analysis of 38 studies from January 1 - February 28 mostly performed in China and including 3,062 COVID-19 patients found that the **most common symptoms of COVID-19 were fever, fatigue, cough, and expectoration**. **ARDS or respiratory failure was present in 19.5% of patients and the fatality rate was 5.5%**.

Abstract:

Objective: We aim to systematically review the clinical characteristics of Coronavirus disease 2019 (COVID-19).
Methods: Seven datebases *(sic)* were searched to collect studies about the clinical characteristics of COVID-19 from 1 January 2020 to 28 February 2020. Then, meta-analysis was performed by using Stata12.0 software.
Results: A total of 38 studies involving 3 062 COVID-19 patients were included. **Meta-analysis showed that a higher proportion of infected patients were male (56.9%). The incidence rate of respiratory failure or ARDS was 19.5% and the fatality rate was 5.5%. Fever (80.4%), fatigue (46%), cough (63.1%) and expectoration (41.8%) were the most common clinical manifestations**. Other common symptoms included muscle soreness (33%), anorexia (38.8%), chest tightness (35.7%), shortness of breath (35%), dyspnea (33.9%). Minor symptoms included nausea and vomiting (10.2%), diarrhea (12.9%), headache (15.4%), pharyngalgia(13.1%), shivering (10.9%) and abdominal pain (4.4%). Patients with asymptomatic was 11.9%. Normal leukocytes counts (69.7%), lymphopenia (56.5%), elevated C-reactive protein levels (73.6%), elevated ESR (65.6%) and oxygenation index decreased (63.6%) were observed in most patients. **About 37.2% of patients with elevated D-dimer, 25.9% of patients with leukopenia, along with abnormal levels of liver function (29%) and renal function (25.5%).** Other findings included leukocytosis (12.6%) and elevated procalcitonin (17.5%). Only 25.8% of patients had lesions involving single lung and 75.7% of patients had lesions involving bilateral lungs.
Conclusions: The most commonly experienced symptoms of COVID-19 patients were fever, fatigue, cough and expectoration. A relatively small percentage of patients were asymptomatic. Most patients showed normal leucocytes counts, lymphopenia, elevated levels of C-reactive protein and ESR. Bilateral lungs involvement was common.

Faecal calprotectin indicates intestinal inflammation in COVID-19.

Effenberger M, Grabherr F, Mayr L, Schwaerzler J, Nairz M, Seifert M, Hilbe R, Seiwald S, Scholl-Buergi S, Fritsche G, Bellmann-Weiler R, Weiss G, Müller T, Adolph TE, Tilg H.Effenberger M, et al.
Gut.
2020 Apr 20; PMID: 32312790
Level of Evidence: 4 - Case Series
Type of Article: Research
Summary: Case series of 40 patients hospitalized with COVID-19 found: 55% of patients reported recent or ongoing diarrhea, **elevated fecal calprotectin levels in patients reporting diarrhea compared to those without diarrhea (p<0.001)**, presence of fecal SARS-CoV-2-RNA in 30% of patients, and a **notable absence of SARS-CoV-2 RNA in patients with ongoing diarrhea.**

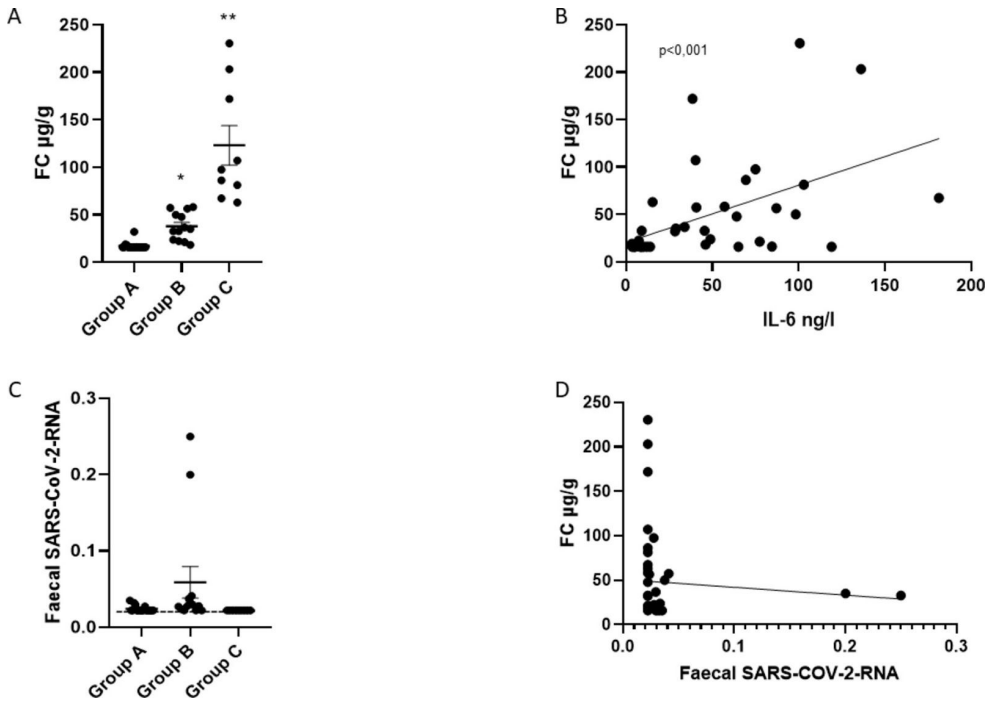


Figure 1: Increased [fecal calprotectin] and serum IL-6 feature acute diarrhoea in COVID-19. (A) FC concentration determined by ELISA. Group A (n=18): COVID-19 patients without diarrhoea. Group B (n=13): COVID-19 patients who reported diarrhoea which ceased 48 hours before stool collection. Group C (n=9): COVID-19 patients with acute diarrhoea (onset <48 hours) (*p<0.001, group B versus group A; **p<0.001, group C versus groups B and A). (B) Correlation of serum IL-6 concentration with FC concentration reported in A. (C) Detection of faecal SARS-CoV-2-RNA by PCR, reported as 1/cycle threshold value. Dashed line indicates threshold of RNA detection. (D) Correlation of faecal SARS-CoV-2-RNA (as in C) with FC. COVID-19, coronavirus disease 2019; FC, faecal calprotectin; IL-6, interleukin-6; SARS-CoV-2, severe acute respiratory syndrome corona virus 2.

Varicella-like exanthem associated with COVID-19 in an 8-year-old girl: A diagnostic clue?

Genovese G, Colonna C, Marzano AV.
Pediatr Dermatol
2020 Apr 21; PMID: 32315079
Level of Evidence: 4 - Case study
Type of Article: Research

Summary: An asymptomatic 8-year-old girl who later tested positive for COVID-19 presented with a varicella-like papulovesicular exanthem involving the trunk, 6-day history of mild cough, and mild thrombocytopenia. The patient's skin lesions and mild systemic symptoms recovered without therapy in 7 days.

Figure: Scattered erythematous papulovesicular rash involving the trunk in a COVID-19 pediatric patient

Morbilliform Exanthem Associated with COVID-19.

Najarian DJ
JAAD Case Rep
2020 Apr 20; PMID: 32313826; No abstract available.
Level of Evidence: 4 - Case Report
Type of Article: Research

Summary: This case report illustrates that COVID-19 may present with cutaneous eruptions similar to those seen in Epstein Barr virus.

Cutaneous Clinico-Pathological Findings in three COVID-19-Positive Patients Observed in the Metropolitan Area of Milan, Italy.

Gianotti R, Veraldi S, Recalcati S, Cusini M, Ghislanzoni M, Boggio F, Fox LP, Gianotti R, et al.
Acta Dermato-Venereologica
2020 Apr 21, PMID: 32315073
Level of Evidence: 4 - Case Series
Type of Article: Case Series

Summary: The article discusses various cases of Italian patients with COVID-19 and focuses on the various cutaneous presentations. They found that patients most commonly experienced erythematous rashes, otherwise presentations included urticaria, a dengue like rash, as well as papules and vesicles.

Fig. 1. Case 1 (A). Erythema on the abdomen. (B). Erythematous macules on a leg. (C). Diffuse erythematous macules on a forearm. Case 2 (D). Erythema on the chest and abdomen. (E). Close up image demonstrating erythematous plaques made up of tiny papules. Case 3 (F, G). Widespread erythematous crusted papules; some of them are erosive.

doi: 10.2340/00015555-XXXX
Acta Derm Venereol 2020; 100: XX–XX

The need for urogenital tract monitoring in COVID-19.

Wang S, Zhou X, Zhang T, Wang Z.
Nat Rev Urol
2020 Apr 20; PMID: 32313110
Level of Evidence: 5 – Expert Opinion
Type of Article: Comment

BLUF: This article reviews evidence that COVID-19 infections can impair kidney function and postulates that this may be mediated by ACE2 receptor expression in parts of the urogenital tract, renal tubules, seminiferous ducts, the prostate, and Leydig cells.

Summary: The authors summarize findings from a variety of studies that investigate COVID-19's impact on the urogenital tract.

1. COVID-19 infection may lead to acute kidney injury (AKI) and development of AKI is a poor prognostic factor

2. Similar to MERS, kidney damage seem localized to the renal tubules, not the glomeruli
3. Pre-existing chronic kidney disease may be a useful factor for predicting mortality
4. COVID-19 may induce orchitis
5. Mechanism for urogenital tract involvement may be a consequence of the high expression of ACE2 receptors in renal tubules, seminiferous ducts, the prostate, and Leydig cells.

Guillain Barre syndrome associated with COVID-19 infection: A case report.

Sedaghat Z, Karimi N.Sedaghat Z, et al.
J Clin Neurosci.
2020 Apr 15; PMID: 32312628
Level of Evidence: 4 - Case report
Type of Article: Research

BLUF: Guillain Barre Syndrome (GBS) described in a 65 y.o. male patient who had two weeks of cough and fever prior to developing acute progressive ascending symmetric ascending quadriparesis. RT-PCR is positive for COVID-19, electrodiagnostic test showed AMSAN variant.

Abstract:
Novel outbreak with coronavirus 2019 began since 31 December 2019. Coronaviruses can cause multiple systemic infections that respiratory complications are the most obvious symptoms. In this report, we describe the symptoms of Guillain Barre syndrome (GBS) in one infected patient with COVID-19, for the first time. We reported a **65-years- old male patient with complaints of acute progressive symmetric ascending quadriparesis. Two weeks prior to hospitalization, the patient suffered from cough, fever, and RT-PCR was reported positive for COVID-19 infection. The electrodiagnostic test showed that the patient is an AMSAN variant of GBS.** COVID-19 stimulates inflammatory cells and produces various inflammatory cytokines and as a result, it creates immune-mediated processes. GBS is an immune-mediated disorder and molecular mimicry as a mechanism of autoimmune disorder plays an important role in creating it. It is unclear whether COVID-19 induces the production of antibodies against specific gangliosides. Further investigations should be conducted about the mechanism of GBS in patients with COVID-19, in the future.

Guillain-Barré Syndrome associated with SARS-CoV-2 infection.

Virani A, Rabold E, Hanson T, Haag A, Elrufay R, Cheema T, Balaan M, Bhanot N.
IDCases
2020 Apr 18; PMID: 32313807
Level of Evidence: 4 - Case Study
Type of Article: Research

BLUF: A 54-year-old male who initially presented with ascending weakness of 2 day duration along with fever and non-productive cough of 10 day duration was diagnosed with Guillian-Barré Syndrome (GBS) and concurrent COVID-19 (nasopharyngeal PCR). The authors advise isolation precaution may be warranted for patients presenting with GBS.

ABSTRACT: We present a case of Guillain- Barré Syndrome (GBS) in a patient with confirmed COVID-19 infection. **GBS in *[sic]* commonly encountered after an antecedent trigger, most commonly an infection.** To date, only one case of GBS associated with this infection has been described. Clinicians should consider this entity since it **may warrant appropriate isolation precautions** especially in a patient who may not present primarily with typical constitutional and respiratory symptoms associated with COVID-19.

COVID-19 infection may cause ketosis and ketoacidosis.

Li J, Wang X, Chen J, Zuo X, Zhang H, Deng A.Li J, et al.
Diabetes Obes Metab.
2020 Apr 20; PMID: 32314455
Level of Evidence: - Cohort study
Article Type: Cohort study

Summary: 658 cases were reviewed and assessed for presence of Ketosis. 42 patients had ketosis. The authors compare rates of ketosis, progression to ketoacidosis, and mortality between diabetic and non-diabetic patients. They suggest that covid-19 causes ketosis and possibly ketoacidosis, although the position is not thoroughly defended.

Association Between Ages and Clinical Characteristics and Outcomes of Coronavirus Disease 2019.

Liu Y, Mao B, Liang S, Yang JW, Lu HW, Chai YH, Wang L, Zhang L, Li QH, Zhao L, He Y, Gu XL, Ji XB, Li L, Jie ZJ, Li Q, Li XY, Lu HZ, Zhang WH, Song YL, Qu JM, Xu JF; Shanghai Clinical Treatment Experts Group for COVID-19.Liu Y, et al.
Eur Respir J
2020 Apr 20; PMID: 32312864; No abstract available
Level of Evidence: 4 - Cross-sectional
Type of Article: Letter

Summary Excerpt: "This study showed that clinical features and prognosis of the disease vary among patients of different ages and a thorough assessment of age may help clinicians worldwide to establish risk stratification for all COVID-19 patients. **Patients over 60 years showed heavier clinical manifestations, greater severity and longer disease courses compared with those under 60 years**. Closer monitoring and more medical interventions may be needed for the elder."

Atypical Presentation of COVID-19 in a Frail Older Person

Tay, Hui Sian; Harwood, Rowan
Age Ageing
2020 Apr 21; PMID: 32315386
Level of Evidence: 5 - Case Report
Type of Article: Research

BLUF: Authors detail the presentation of an elderly male with schizoaffective disorder who presented with vague symptoms in the setting of cognitive changes. Postmortem nasal swab discovered the patient was COVID-19 positive, leading the authors to encourage awareness of atypical and vague symptoms, particularly in the frail.

Abstract:
Common symptoms of pandemic coronavirus disease (COVID-19) include fever and cough. **We describe a 94-year-old man with well-controlled schizoaffective disorder, who presented with non-specific and atypical symptoms: delirium, low-grade pyrexia and abdominal pain.** He was given antibiotics for infection of unknown source, subsequently refined to treatment for community-acquired pneumonia. Despite active treatment, he deteriorated with oxygen desaturation and tachypnoea. A repeat chest X-ray showed widespread opacification. A postmortem throat swab identified COVID-19 infection. He was treated in three wards over 5 days with no infection control precautions. **This has implications for the screening, assessment and**

isolation of frail older people to COVID-specific clinical facilities and highlights the potential for spread among healthcare professionals and other patients.

Understanding the Pathology

Melatonin: Roles in influenza, Covid-19, and other viral infections.

Anderson G, Reiter RJ.
Rev Med Virol
2020 Apr 20; PMID: 32314850
Level of Evidence: 5 – Mechanism-based Reasoning
Type of Article: Research

Summary:
"Given the common viral suppression of melatonin, coupled to melatonin's positive modulation of processes inhibited by most viruses, it is not unreasonable to propose melatonin to have utility in limiting the symptomatology and fatality associated with viral infection, including influenza and covid-19. Melatonin may also have prophylactic utility, especially in people with preexistent medical conditions associated with suppressed pineal melatonin synthesis."

Targeting the Adipose Tissue in COVID-19.

Malavazos AE, Corsi Romanelli MM, Bandera F, Iacobellis G
Obesity (Silver Spring)
2020 Apr 21; PMID: 32314871
Level of Evidence: 5 - Mechanistic reasoning
Type of Article: Research

Summary: The authors suggest a mechanistic explanation for the role of obesity in increasing COVID-19 severity via ACE2 and DPP4. Research on SARS and MERS have demonstrated that coronaviruses can bind to both of these receptors leading the authors to suggest that the presence of ACE2 and DPP4 receptors on adipose tissue may explain some of the increased disease severity seen in obese patients. Additionally, known interactions between adipose tissue and the immune system could contribute to a cytokine storm. This mechanistic understanding of the direct involvement of adipose tissue could offer new targets for therapy.

Is Adipose Tissue a Reservoir for Viral Spread, Immune Activation and Cytokine Amplification in COVID-19

Ryan PM, Caplice NM
Obesity (Silver Spring)
2020 Apr 21; PMID: 32314868
Level of Evidence: 5 – Mechanism-based Reasoning
Type of Article: Review/Research

BLUF: This article proposes a theoretical pathophysiological mechanism of increased susceptibility to COVID-19 for patients with obesity. The rationale draws from diverse literature sources, citing increased production of **pro-inflammatory cytokines (IL-6) in adipose tissue** and **precedent of viral infiltration** of resident adipose cells, though the authors acknowledge that there is currently **no data suggesting adipose tissue harbors SARS-CoV-2**. Nevertheless, they **recommend checking adipose tissue in autopsy** to test for SARS-CoV-2 infiltration and investigating global and tissue-specific cytokine profiles.

Abstract:
Coronavirus disease 2019 (COVID-19), the worst pandemic in more than a century, has claimed >125,000 lives worldwide to date. Emerging predictors for poor outcome include advanced age, male gender, pre-existing cardiovascular disease and risk factors including hypertension, diabetes and

more recently obesity. Herein, **we posit new obesity-driven predictors of poor COVID-19 outcome**, over and above the more obvious extant risks associated with obesity including cardiometabolic disease and hypoventilation syndrome in intensive care patients. We outline a **theoretical mechanistic framework** whereby **adipose tissue** in subjects with obesity may act as a **reservoir for more extensive viral spread** with increased shedding, immune activation and cytokine amplification. We **propose studies to test this reservoir concept** with a focus on specific cytokine pathways that might be amplified in subjects with obesity and COVID-19. Finally, we **underscore emerging therapeutic strategies** that might benefit subsets of patients in which cytokine amplification is excessive and potentially fatal.

COVID-19 and the eye immunity: lesson learned from the past and possible new therapeutic insights.

Neri P, Pichi F.Neri P, et al.
Int Ophthalmol.
2020 Apr 20; PMID: 32314322
Level of Evidence: 5 – Expert opinion/Mechanism-based reasoning
Article Type: Editorial
Summary: It is noted that in prior experiments injecting murine coronavirus into mouse eyes, far more damage was done by a post-viral immune response than by the virus itself. The authors note the same pathophysiology is present in other viral syndromes like herpes encephalitis, and they suggest that if COVID-19 causes death mainly by inducing post-viral autoimmune disease of the lungs, monoclonal antibody therapy (which is currently being considered) and steroid therapy (which is not currently recommended by major institutions for COVID-19) should be tried in the later stage of the disease.

Transmission & Prevention

Developments in Transmission & Prevention

What are the Underlying Transmission Patterns of COVID-19 Outbreak? - An Age-specific Social Contact Characterization.

Liu Y, Gu Z, Xia S, Shi B, Zhou XN, Shi Y, Liu J
EClinicalMedicine
2020 Apr 18; PMID: 32313879
Level of Evidence: 5 - Computational model
Type of Article: Research

BLUF: A computational model focusing on 6 representative Chinese cities demonstrates the effects of various social interventions and back to work policies on viral spread by analyzing human interactions across age groups and social settings (work, home, school, community). Retrospective analysis of disease spread in the 6 cities lends credence to the model. The model could be tailored to other locations by adjusting parameters such as age distribution and context of social interactions, which could guide interventions and responses in countries dealing with COVID-19 to strategically mitigate the impact of the disease.

Abstract:
Background: COVID-19 has spread to 6 continents. Now is opportune to gain a deeper understanding of what may have happened. The findings can help inform mitigation strategies in the disease-affected countries.
Methods: In this work, we examine an essential factor that characterizes the disease transmission patterns: the interactions among people. We develop a computational model to reveal the interactions in terms of the social contact patterns among the population of different age-groups. We divide a city's population into seven age-groups: 0-6 years old (children); 7-14 (primary and junior high school students); 15-17 (high school students); 18-22 (university students); 23-44 (young/middle-aged people); 45-64 years old (middle-aged/elderly people); and 65 or above (elderly people). We consider four representative settings of social contacts that may cause the disease spread: (1) individual households; (2) schools, including primary/high schools as well as colleges and universities; (3) various physical workplaces; and (4) public places and communities where people can gather, such as stadiums, markets, squares, and organized tours. A contact matrix is computed to describe the contact intensity between different age-groups for each of the four settings. By integrating the four contact matrices with the next-generation matrix, we quantitatively characterize the underlying transmission patterns of COVID-19 among different populations.
Findings: We focus our study on 6 representative cities in China: Wuhan, the epicenter of COVID-19, together with Beijing, Tianjin, Hangzhou, Suzhou, and Shenzhen, which are five major cities from three key economic zones. The results show that the social contact-based analysis can readily explain the underlying disease transmission patterns as well as the associated risks (including both confirmed and unconfirmed cases). In Wuhan, the age-groups involving relatively intensive contacts in households and public/communities are dispersedly distributed. This can explain why the transmission of COVID-19 in the early stage mainly took place in public places and families in Wuhan. We estimate that Feb. 11, 2020 was the date with the highest transmission risk in Wuhan, which is consistent with the actual peak period of the reported case number (Feb. 4-14). Moreover, the surge in the number of new cases reported on Feb. 12-13 in Wuhan can readily be captured using our model, showing its ability in forecasting the potential/unconfirmed cases. We further estimate the disease transmission risks associated with different work resumption plans in these cities after the outbreak.

The estimation results are consistent with the actual situations in the cities with relatively lenient control policies, such as Beijing, and those with strict control policies, such as Shenzhen. Interpretation: With an in-depth characterization of age-specific social contact-based transmission, the retrospective and prospective situations of the disease outbreak, including the past and future transmission risks, the effectiveness of different interventions, and the disease transmission risks of restoring normal social activities, are computationally analyzed and reasonably explained. The conclusions drawn from the study not only provide a comprehensive explanation of the underlying COVID-19 transmission patterns in China, but more importantly, offer the social contact-based risk analysis methods that can readily be applied to guide intervention planning and operational responses in other countries, so that the impact of COVID-19 pandemic can be strategically mitigated.

A Case Series of Recurrent Viral RNA Positivity in Recovered COVID-19 Chinese Patients.

Zheng KI, Wang XB, Jin XH, Liu WY, Gao F, Chen YP, Zheng MH.
Journal of General Internal Medicine.
2020 Apr 20; PMID: 32314129
Level of Evidence: 4 - Cross sectional observational study with case series
Type of Article: Letter

Summary: This cross sectional study includes 20 COVID-19 patients who recovered from COVID-19 after being admitted to First Affiliated Hospital of Wenzhou Medical University and Wenzhou Central Hospital in Wenzhou, China. Three patients out of the twenty who initially tested negative at discharge developed positive RT-PCR test seven days later suggesting the possibility of reinfection.

The role of additive manufacturing and antimicrobial polymers in the COVID-19 pandemic.

Zuniga, Jorge M; Cortes, Aaron
Expert Review of Medical Devices
2020 Apr 20; PMID: 32312129
Level of Evidence: 5 - Expert Opinion
Type of Article: Editorial

BLUF: Copper nanocomposites are an effective antimicrobial polymer and can be used in additive manufacturing to produce medical devices with antimicrobial and antiviral properties.

Summary:
"The purpose of the current manuscript is to provide a perspective of the role of additive manufacturing in the COVID-19 pandemic with an emphasis in the mechanism of action and applications of antimicrobial polymers for the development of critical medical devices." **Copper nanocomposites are evaluated for their antimicrobial properties and use in critical medical devices**, such as reusable face masks. Additionally, as the pandemic develops, mechanical ventilators will play an important role and the authors explore how a **single ventilator can be expanded through the use of repurposing connectors** which can be produced through additive manufacturing.

Prevention in the community

An effective screening and management process in the outpatient clinic for patients requiring hospitalization during the COVID-19 pandemic.

Guo F, Du Z, Wang T.
J Med Virol

2020 Apr 21; PMID: 32314819
Level of Evidence: 5 – Expert Opinion
Type of Article: Letter
Summary: This article describes a screening process employed in China for patients who present to outpatient clinics but ultimately need hospitalization for a condition that is not COVID-19. This process involves RT-PCR testing, antibody testing, and chest CT, with a high index of suspicion for false negatives. Inpatients are also kept in single rooms with limited opportunities to move around the ward and no visitors are permitted. The authors indicate that this protocol has been an efficient way to screen and manage patients presenting to outpatient clinics.

Prevention in the hospital

Responding to the COVID-19 outbreak in Singapore: Staff Protection and Staff Temperature and Sickness Surveillance Systems.

Htun HL, Lim DW, Kyaw WM, Loh WJ, Lee LT, Ang B, Chow A.
Clin Infect Dis
2020 Apr 21; PMID: 32315026
Level of Evidence: 4 - Cross sectional study
Type of Article: Research
BLUF: A cross sectional study of 10,583 frontline healthcare workers in Singapore were monitored for illness while they used PPE appropriate for their risk for exposure. They conducted fever and sickness surveillance with daily temperature checks, and provided enhanced medical surveillance of unwell and high-risk staff. Although a median of 8 healthcare workers reported illness, no staff were infected with COVID-19, indicating that an enhanced medical surveillance and protection system is effective in preventing illness or transmission.

Abstract:
Background: Coronavirus disease 2019 (COVID-19) is an emerging infectious disease caused by novel coronavirus (SARS-CoV-2), and first reported in Wuhan, China, in December 2019. Since the severe acute respiratory syndrome (SARS) outbreak in 2003, Tan Tock Seng Hospital (TTSH) in Singapore has routinely fit-tested staff for high filtration N95 respirators, and established web-based staff surveillance systems. The routine systems were enhanced in response to Singapore's first imported COVID-19 case on January 23,2020.
Methods: We conducted a **cross-sectional study**, from January 23,2020 to February 23,2020, among healthcare workers to evaluate the effectiveness of the staff protection and surveillance strategy in TTSH, a 1600-bed multidisciplinary acute-care hospital co-located with the 330-bed National Centre for Infectious Diseases (NCID). As of February 23,2020, TTSH/NCID has managed 76% of confirmed COVID-19 cases in Singapore. The hospital adopted a **multi-pronged approach to protect and monitor staff with potential COVID-19 exposures:(1) Risk-based personal protective equipment, (2) Staff fever and sickness surveillance, and (3) Enhanced medical surveillance of unwell staff**.
Results: A total of 10,583 staff were placed on hospital-wide fever and sickness surveillance, with 1,524 frontline staff working in COVID-19 areas under close surveillance. Among frontline staff, a median of eight staff illness episodes was seen per day, and almost 10% (n=29) resulted in hospitalization. **None of the staff was found to be infected with COVID-19**.
Conclusions: A robust staff protection and health surveillance system that is routinely implemented during non-outbreak periods and enhanced during the COVID-19 outbreak is effective in protecting frontline staff from the infection.

Extubation barrier drape to minimise droplet spread.

Patino Montoya M, Chitilian HV.Patino Montoya M, et al.
British Journal of Anaesthesia
2020 Apr 11, PMID: 32312570
Level of Evidence: 5 - Literature Cited
Type of Article: Correspondence

Summary:
This letter proposed a new tool, which would be especially useful for protecting anesthesiologists from COVID-19 risk while intubating, monitoring and extubating patients. They used a clear plastic sheet with a small slit to create a draped barrier between the physician and patient during surgeries. They went through a step by step instruction of how to practically navigate valves and clamps to navigate the tracheal tube and cuff inflation adapter through the slit.

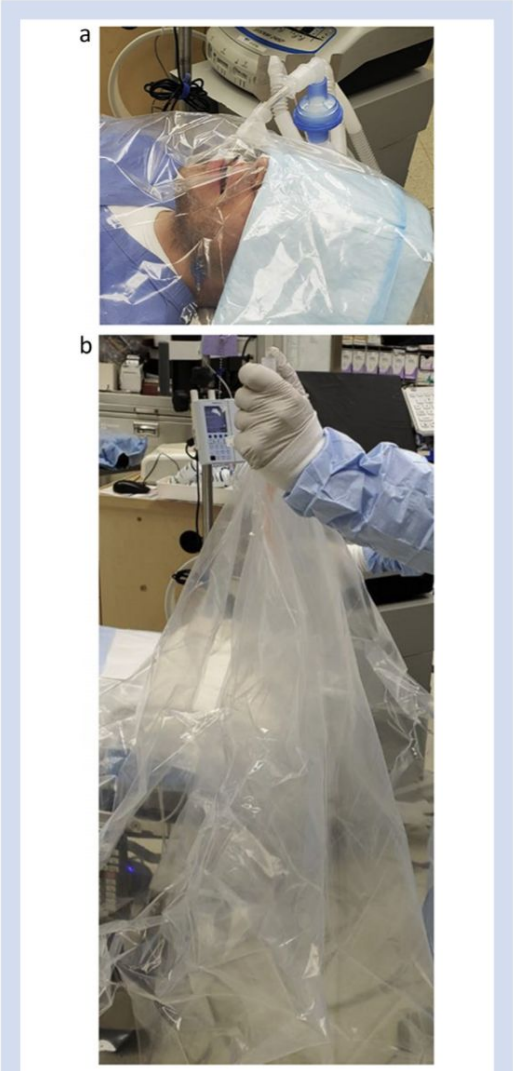


Fig 1. (a) Extubation barrier drape with tracheal tube emerging through a slit in the drape. The drape is then taped to the tracheal tube in a manner that seals the hole. (b) After extubation. Patient side of drape has collapsed over the tracheal tube and the whole unit can be discarded, protecting anaesthesia provider from contact with aerosolised droplets.

Reducing droplet spread during airway manipulation: lessons from the COVID-19 pandemic in Singapore.

Au Yong PS, Chen X.Au Yong PS, et al.
Br J Anaesth.
2020 Apr 15; PMID: 32312572No abstract available.
Level of Evidence: 5 - Expert opinion
Type of Article: Letter

Summary: An anesthesiologist gives his recommendations for reducing droplet spread during intubation and extubation. He **describes the use of a plastic sheet or screen during and while the patient is intubated and use of a plastic screen or Hudson mask for extubation.**

Figure 2: Position of C-MAC screen

Figure 3: Plastic tent for intubation

Figure 4: Plastic screen for preoxygenation

Figure 5: Plastic screen for extubation

A rapid transition to voluntary breath hold from device-assisted moderate deep inspiration breath hold for patients receiving breast radiotherapy during the COVID-19 pandemic.

Barnett E, Comsa D, Zhang B, Pestill T, Bradley C, Proctor L, Mohamoud G, Ryan M, Loudon J, Fenkell L
Adv Radiat Oncol.

Apr 18, 2020; PMID: 32313844
Level of Evidence: 5 - Expert Opinion
Type of Article: Methods
BLUF: This report discusses a rapid and smooth implementation of voluntary breath holding for patients receiving breast radiotherapy to prevent transmission of COVID-19 during the pandemic.

Summarizing statement: "Quality care in the context of breast cancer radiotherapy means continuing to offer cardiac sparing treatment techniques during the COVID-19 pandemic. Our radiation medicine program was able to respond quickly and efficiently to the recommendations from the global radiation oncology community and transition breast radiotherapy using the ABC system to a deviceless vBH technique. **In total the transition took seven clinical days of considerable effort with team members from radiation oncology, radiation therapy and medical physics working cohesively**. On the eighth day all breast patients previously on treatment using the ABC device were transitioned to the vBH delivery technique and CT simulation for eligible patients was performed with the vBH technique."

Management

Acute Care

COVID-19 complicated by Acute Pulmonary Embolism and Right-Sided Heart Failure.

Ullah W, Saeed R, Sarwar U, Patel R, Fischman DL.Ullah W, et al.
JACC Case Rep.
2020 Apr 17; PMID: 32313884
Level of Evidence: 5 – Case Report
Article Type: Case Report

Summary: A patient evaluated for suspected pneumonia had a CT that was negative for PE. The following day, her COVID-19 PCR returned positive, and plans were made to discharge the patient to supportive care. Before that could be done, she developed acute shortness of breath. A subsequent CT found new, bilateral pulmonary emboli and a linear saddle pulmonary embolus. She was anticoagulated and discharged home without incident. Given previously demonstrated correlation between an elevated D-dime and mortality in COVID-19 patients, an increased index of suspicion for PE is recommended for covid-19 patients.

Emergency Medicine

Emergency tracheal intubation in 202 patients with COVID-19 in Wuhan, China: lessons learnt and international expert recommendations.

Yao W, Wang T, Jiang B, Gao F, Wang L, Zheng H, Xiao W, Yao S, Mei W, Chen X, Luo A, Sun L, Cook T, Behringer E, Huitink JM, Wong DT, Lane-Fall M, McNarry AF, McGuire B, Higgs A, Shah A, Patel A, Zuo M, Ma W, Xue Z, Zhang LM, Li W, Wang Y, Hagberg C, O'Sullivan EP, Fleisher LA, Wei H; collaborators
Br J Anaesth
2020 Apr 10; PMID: 32312571
Level of Evidence: 4 - Case series
Type of Article: Research

Summary Excerpt: "Editor's key points:
Data from a series of 202 coronavirus disease 2019 (COVID-19) patients undergoing tracheal intubation in two hospitals in Wuhan, China were analysed and used to guide expert consensus recommendations from an international panel.

- Using rapid sequence induction, first-pass intubation occurred in 89%, with hypoxaemia and hypotension common during intubation.
- Other adverse outcomes included cardiac arrest (2%), pneumothorax (6%), and death within 24 h (10%).
- Operators wore at least Level 3 personal protective equipment [shown in Figure 1], and none became infected.
- A **detailed strategy and methods for tracheal intubation** in COVID-19 patients are proposed [and **outlined in figure 2 listed below**]."

Abstract
Tracheal intubation in coronavirus disease 2019 (COVID-19) patients creates a risk to physiologically compromised patients and to attending healthcare providers. Clinical information on airway

management and expert recommendations in these patients are urgently needed. By analysing a two-centre retrospective observational case series from Wuhan, China, a panel of international airway management experts discussed the results and formulated consensus recommendations for the management of tracheal intubation in COVID-19 patients. Of 202 COVID-19 patients undergoing emergency tracheal intubation, most were males (n=136; 67.3%) and aged 65 yr or more (n=128; 63.4%). Most patients (n=152; 75.2%) were hypoxaemic (Sao_2 <90%) before intubation. Personal protective equipment was worn by all intubating healthcare workers. Rapid sequence induction (RSI) or modified RSI was used with an intubation success rate of 89.1% on the first attempt and 100% overall. Hypoxaemia (Sao_2 <90%) was common during intubation (n=148; 73.3%). Hypotension (arterial pressure <90/60 mm Hg) occurred in 36 (17.8%) patients during and 45 (22.3%) after intubation with cardiac arrest in four (2.0%). Pneumothorax occurred in 12 (5.9%) patients and death within 24 h in 21 (10.4%). Up to 14 days post-procedure, there was no evidence of cross infection in the anaesthesiologists who intubated the COVID-19 patients. Based on clinical information and expert recommendation, we propose detailed planning, strategy, and methods for tracheal intubation in COVID-19 patients.

Fig 1. Two layers of personal protective equipment. (a) Inner layer. (b) Outer layer with a face field. (c) Outer layer with a hood without a powered air-purifying respirator (PAPR). (d) Outer layer with a hood PAPR.

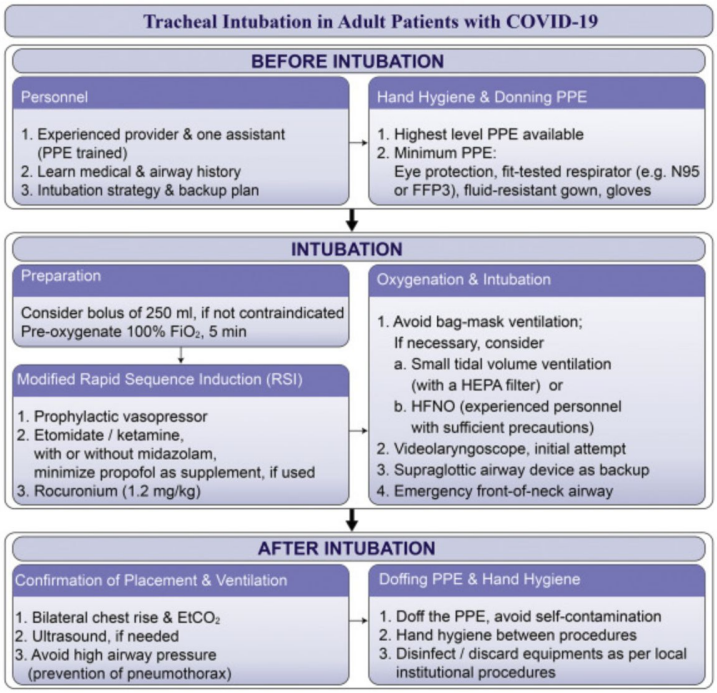


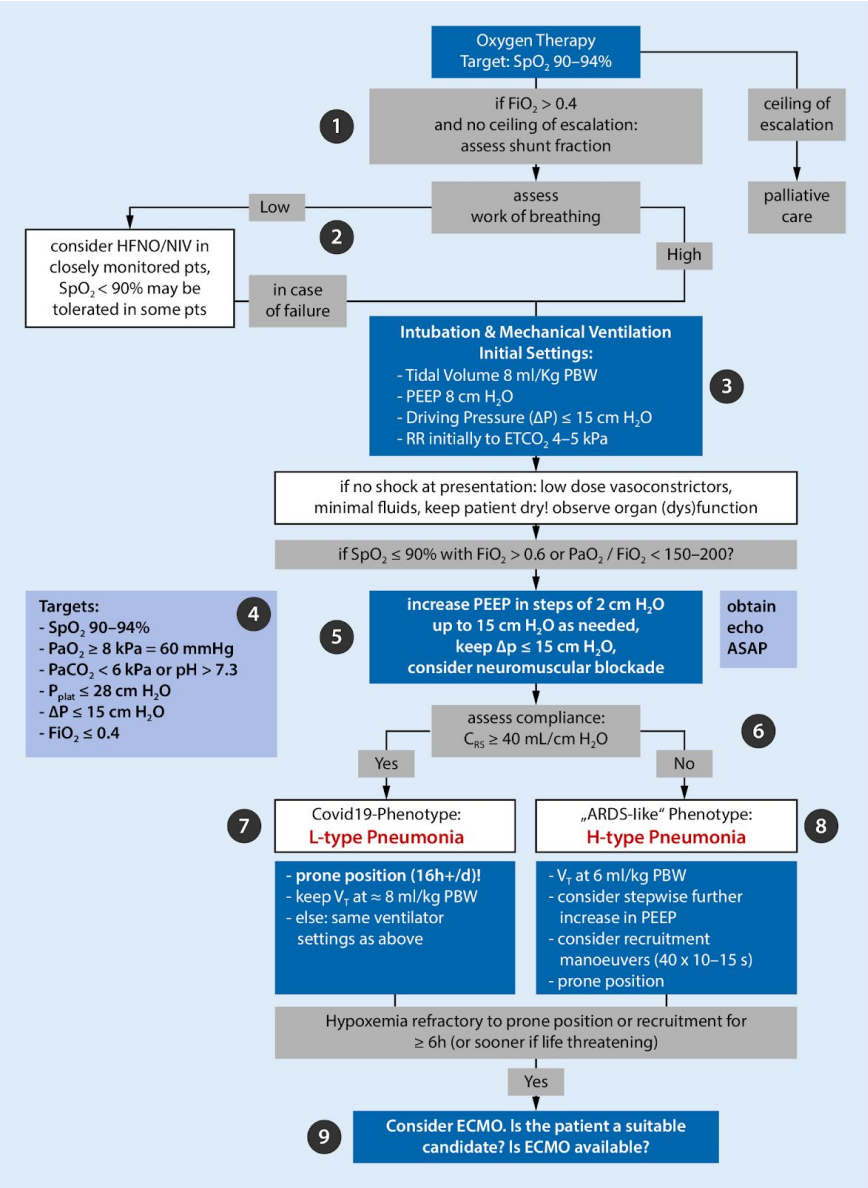
Fig 2. Flow chart of recommended tracheal intubation procedure in patients with coronavirus disease 2019 (COVID-19). A suggested strategy based on clinical data for tracheal intubation in 202 patients with COVID-19 from Wuhan, China, and on recommendations from a group of international experts in airway management. $Etco_2$, end-tidal carbon dioxide; Fio_2, fraction of inspired oxygen; HEPA, high-efficiency particulate air; HFNO, high-flow nasal oxygen; PPE, personal protective equipment.

Critical Care

Ventilation of COVID-19 patients in intensive care units.

Möhlenkamp S, Thiele H.Möhlenkamp S, et al.
Herz.
2020 Apr 20; PMID: 32313971
Level of Evidence: 5 – Mechanism-based reasoning/Expert opinion
Article Type: Editorial

Summary: Covid-19 pathophysiology, indications for non-invasive ventilation (NIV) management vs mechanical ventilation, the difference between low- and high-compliance lung physiology in COVID-19 pneumonia, use of heparin, and other related topics are discussed in this 1-page set of recommendations for critical care for COVID-19 patients.



Obesity Is Associated With Severe Forms of COVID-19

Caussy C, Wallet F, Laville M, Disse E
Obesity (Silver Spring)
2020 Apr 21; PMID: 32314861

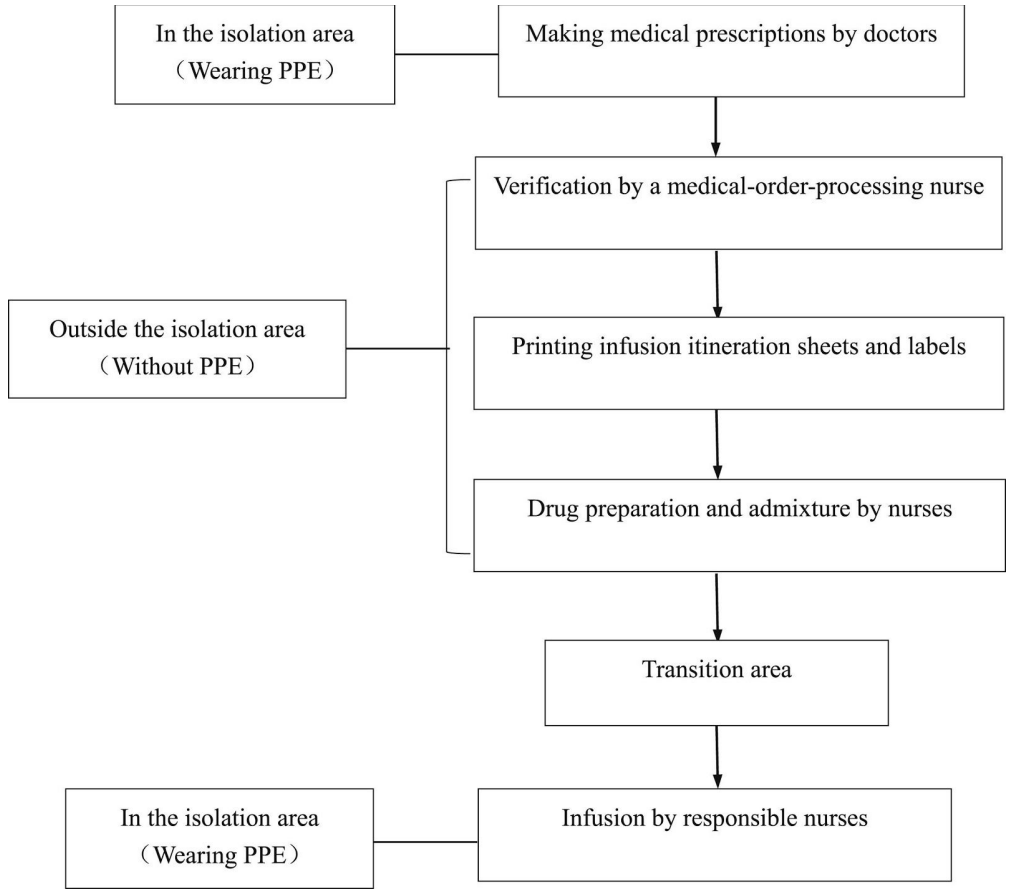
Level of Evidence: Level 5 – Mechanism-based Reasonings
Type of Article: Letter
BLUF: This article is a response to Simonnet A, Chetboun M, et al. (2020), which reports a higher frequency of obesity in patients with COVID-19 requiring invasive mechanical ventilation (IMV) at CHU de Lille in France. Though the author's data aligns with the study in question, the authors **urge caution in interpretation of effect sizes**, centering the discussion around a **lack of standardized guidelines for IMV indication** in patients with COVID-19. Further, they highlight differences in regional rates of obesity and use of alternate supportive measures (like nasal cannulae) as confounders that were not addressed in the original study.

Abstract:
We have read with great interest the Brief Cutting Edge Report from **Simonnet** et al. which reports a **high prevalence of obesity** in severe acute respiratory syndrome coronavirus-2 (**SARS-Cov-2**) **requiring invasive mechanical ventilation**. In the context of unprecedented health crisis due to the coronavirus disease 2019 (COVID-19) outbreak, these results are of a great importance and **may have major implications in public health strategy** especially in western countries affected by a high prevalence of obesity.

Optimization of the intravenous infusion workflow in the isolation ward for patients with coronavirus disease 2019.

Song Y, Wang W, Zhang L, Sha L, Lu G, Song Y, et al.
Int J Nurs Sci.
2020 Apr 3; PMID: 32313713
Level of Evidence: 5 – Mechanism-based reasoning
Article Type: Quality Improvement/Process Improvement Report
Summary: A group of nurses optimized IV infusion treatment on COVID-19 isolation wards (See figure below). They found decreased patient waiting time, increased patient satisfaction, and decreased PPE use resulted.

Abstract
Objective: This study aimed to evaluate the effect of optimization of the intravenous infusion workflow in isolation wards for patients with coronavirus disease 2019.
Methods: The infusion management group optimized the intravenous infusion workflow based on Hamer's Process Reengineering Theory and applied it to the treatment of patients with coronavirus disease 2019. The work efficiency, patients' satisfaction and economic indicators before and after optimization were compared**.**
Results: After the infusion workflow was optimized, average times for preparation drugs and intravenous admixture, and patients' waiting time decreased from 4.84 min, 4.03 min, and 34.33 min to 3.50 min, 2.60 min, and 30.87 min, respectively, patients' satisfaction increased from 66.7% to 93.3%, and the cost of personal protective equipment (PPE) decreased from 46.67 sets and 186.6 CNY per day to 36.17 sets and 144.6 CNY, with statistical significanc**e.**
Conclusion: The optimization of the intravenous infusion workflow can effectively decrease the cost of PPE while improving the efficiency of infusion and patients' satisfaction.



Veno-venous extracorporeal membrane oxygenation for severe pneumonia: COVID-19 case in Japan.

Taniguchi H, Ogawa F, Honzawa H, Yamaguchi K, Niida S, Shinohara M, Takahashi K, Iwashita M, Abe T, Kubo S, Kudo M, Takeuchi I.Taniguchi H, et al.
Acute Med Surg.
2020 Apr 14; PMID: 32313662
Level of Evidence: 5 – Case Report
Article Type: Case Report

Summary: A 72 y/o Native Hawaiin woman with CKD4, DM2, BMI 38 was transferred to a Japanese ED for dyspnea and fever, and admitted to a respiratory isolation ward with diagnosis of COVID-19 pneumonia. She subsequently developed severe ARDS and septic shock, and was treated with antivirals and started on ECMO and CRRT. Treatment was successful, ECMO was discontinued after 6 days and she was weaned off a ventilator on hospital day 19. The authors discuss the lack of known curative treatments for COVID-19 and the need for more organized efforts to gather data on ECMO and set quality guidelines.

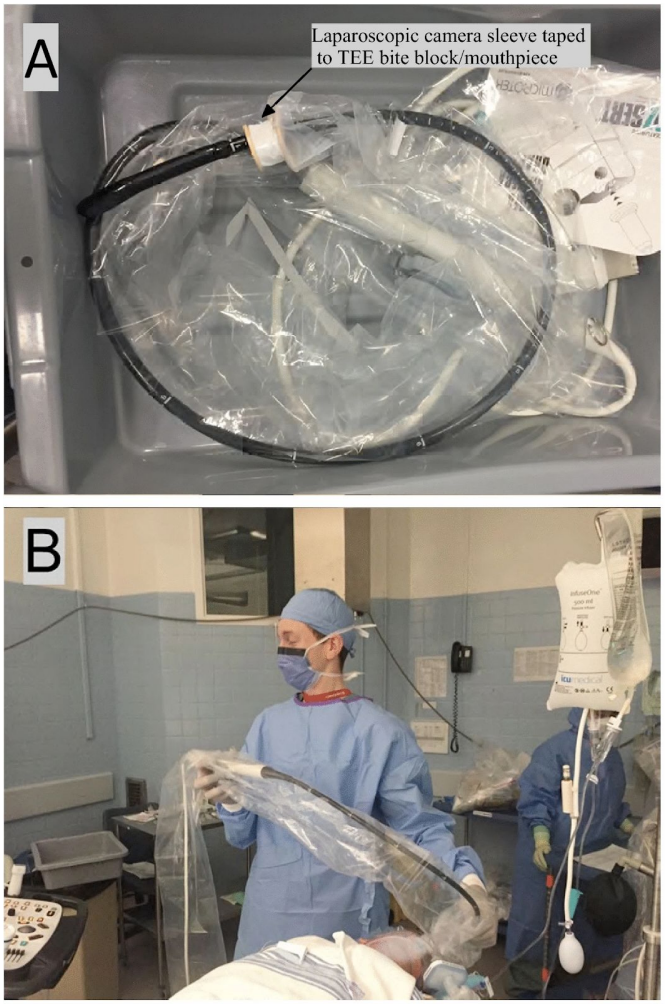
Internal Medicine

Safe(r) transesophageal echocardiography and COVID-19.

Bracco D.
Can J Anaesth.

2020 Apr 20; PMID: 32314264
Level of Evidence: 5 - Expert opinion
Type of Article: Letter to the Editor

Summary: The authors outline a technique to reduce droplet transmission and aerosolized secretions during transesophageal echocardiogram (TEE). In this technique, the TEE probe is inserted into a standard laparoscopy sleeve drape, then the bite block/mouthpiece is secured to the stretchable end of the drape and secured with the sleeve's tapes (A). During the TEE examination, the probe is advanced and withdrawn as needed through the sleeve drape (B).



Case Report: Hepatotoxicity Associated with the Use of Hydroxychloroquine in a Patient with Novel Coronavirus Disease (COVID-19).

Falcão MB, Pamplona de Góes Cavalcanti L, Filgueiras Filho NM, Antunes de Brito CA.
The American Journal of Tropical Medicine and Hygiene
April 17,2020; PMID: 32314698
Level of Evidence: - Case Report
Type of Article: Research Article

BLUF: This case report warns of the severe liver toxicity possible as a result of hydroxychloroquine use in patients with COVID-19. **Although it is a rare side effect, liver function should be monitored after administering this drug to avoid similar consequences.**

Abstract:
Hydroxychloroquine (HCQ) has been used for the treatment of novel coronavirus disease (COVID-19) cases. However, evidence of efficacy remains limited, and adverse events can be associated with its use. Here, we report a case of a patient with severe COVID-19 who, after being administered HCQ, exhibited a 10-fold increase in serum levels of transaminases, followed by a rapid decrease after HCQ was withdrawn. Considering the significantly increased use of HCQ during the COVID-19 pandemic, this case alerts us to the potential for HCQ to be associated with hepatotoxicity and the need to monitor liver function during HCQ therapy.

Immunology

COVID-19 and Calcineurin Inhibitors: Should They Get Left Out in the Storm?

Willicombe M, Thomas D, McAdoo S
J Am Soc Nephrol
2020 Apr 20; PMID: 32312797
Level of Evidence: 5 – Expert Opinion
Type of Article: Letter
Summary: The authors consider the benefits and risks of **maintaining calcineurin inhibitors (CNIs) in immunosuppression** treatment regimens for **transplant patients**. The benefits, from a mechanistic standpoint, are supported by *in vitro* data that the CNI cyclosporine hinders Hep C and other coronavirus replication independent of immunosuppression. Though **little data exists on inhibition of SARS-CoV-2 replication** or treatment of COVID-19, the authors suggest that **cyclosporine's role in treating hemophagocytic lymphohistiocytosis** might be parlayed into **treating similar COVID-19 manifestations**.

Radiology

Variable Computed Tomography Appearances of COVID-19

Lim, ZY; Khoo, HW; Hui, TCH; Kok, SSX; Kwan, KEL; Young, BE; Tan, CH; Kaw GJL
Singapore Med J
2020 Apr 21; PMID: 32312025
Level of Evidence: 4 - Case Study
Type of Article: Research
BLUF: The CT scan findings of COVID-19 are diverse and the authors encourage caution when using this modality to diagnose COVID-19 due to cost and contamination risk in the radiology department. They do, however, support the use in areas where the RT-PCR test for COVID-19 is limited and there is a high pre-test probability of infection.

Abstract:
The coronavirus disease 2019 (COVID-19) is typically diagnosed by specific assays that detect viral nucleic acid from the upper respiratory tract; however, this may miss infections involving only the lower airways. Computed tomography (CT) has been described as a diagnostic modality in the COVID-19 diagnosis and treatment plan. We present a case series with virologically confirmed COVID-19 pneumonia. Variable CT features were observed: consolidation with ground-glass opacities, ground-glass opacities with subpleural reticular bands, and an anterior-posterior gradient of lung abnormalities resembling that of acute respiratory distress syndrome. In one patient, we noted evolution of CT findings, where there was interval resolution of bilateral lung consolidation with development of bronchiolectasis and subpleural fibrotic bands. **While sensitive for detecting**

lung parenchymal abnormalities in COVID-19 pneumonia, CT for initial diagnosis is discouraged and should be reserved for specific clinical indications. Interpretation of chest CT findings should be correlated with duration of symptoms to better determine the disease stage and aid in patient management.

Rheumatology

Coronavirus Disease 19 (COVID-19) complicated with pneumonia in a patient with rheumatoid arthritis receiving conventional disease-modifying antirheumatic drugs.

Song J, Kang S, Choi SW, Seo KW, Lee S, So MW, Lim DH
Rheumatol Int
2020 Apr 20; PMID: 32314010
Level of Evidence: 4 - Case report
Type of Article: Research

BLUF: A case report of a 61 year old female patient with rheumatoid arthritis admitted to a hospital in Korea with confirmed Covid-19 by PCR. Following 26 days in the hospital she was discharged with no complications. During her hospitalization her leflunomide and methylprednisone were discontinued but her hydroxychloroquine, famotidine, and meloxicam were continued with the addition of lopinavir/ritonavir.

Abstract

In December 2019, numerous coronavirus disease 2019 (COVID-19) cases were reported in Wuhan, China, which has since spread throughout the world. However, its impact on rheumatoid arthritis (RA) patients is unknown. Herein, we report a case of COVID-19 pneumonia in a 61-year-old female RA patient who was receiving conventional disease-modifying antirheumatic drugs (cDMARDs). The patient presented with a 4-day history of myalgia and febrile sensation. COVID-19 was confirmed by real-time polymerase chain reaction (PCR). Chest X-ray showed increased opacity on the right lower lung area, and C-reactive protein level was slightly elevated. The patient was treated with antiviral agents (lopinavir/ritonavir), and treatment with cDMARDs was discontinued except hydroxychloroquine. Her symptoms and laboratory results gradually improved. Three weeks later, real-time PCR for COVID-19 showed negative conversion, and the patient was discharged without any complications.

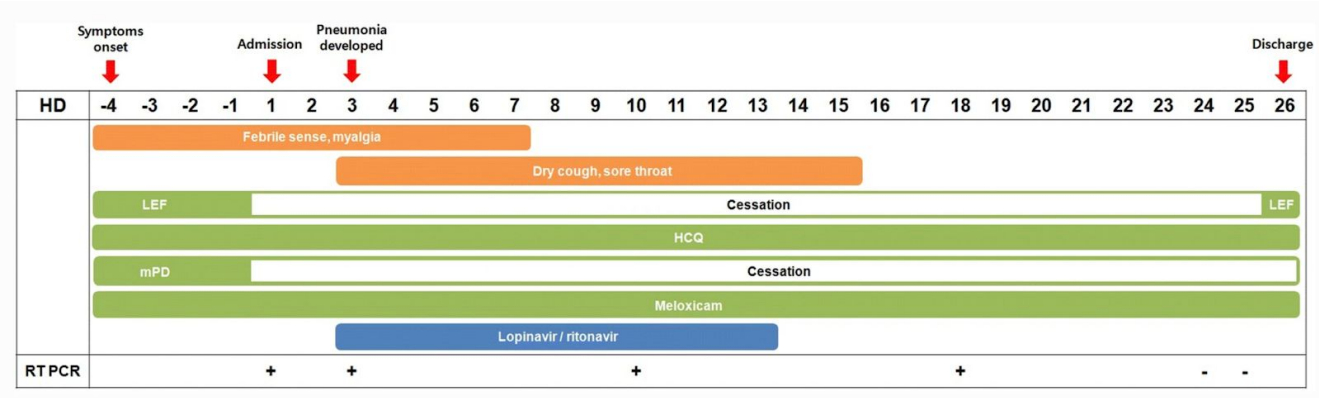


Figure 1. Clinical course and treatment according to the day of hospitalization. *HD* hospital day, *LEF* leflunomide, *HCQ* hydroxychloroquine, *mPD* methylprednisolone, *RT PCR* real-time polymerase chain reaction

Surgery

GI

Bariatric Surgical Practice During the Initial Phase of COVID-19 Outbreak.

Aminian A, Kermansaravi M, Azizi S, Alibeigi P, Safamanesh S, Mousavimaleki A, Rezaei MT, Faridi M, Mokhber S, Pazouki A, Safari S.
Obes Surg
2020 Apr 20; PMID: 32314249
Level of Evidence: 4 – Case Series
Type of Article: Letter

Summary: The authors present 4 cases of gastric bypass operations performed in a 2-week period in Iran, that were complicated with COVID-19 pneumonia. Postoperative pulmonary complications typically seen in bariatric surgical patients complicate the diagnosis and management of COVID-19. Also, patients with severe obesity usually have multiple comorbidities which would make them vulnerable to severe form of COVID-19.

PM&R

Physiotherapy management for COVID-19 in the acute hospital setting: clinical practice recommendations.

Thomas P, Baldwin C, Bissett B, Boden I, Gosselink R, Granger CL, Hodgson C, Jones AY, Kho ME, Moses R, Ntoumenopoulos G, Parry SM, Patman S, van der Lee L.Thomas P, et al.
J Physiother.
2020 Mar 30; PMID: 32312646
Level of Evidence: Level 5 - Expert Opinion
Type of Article: Invited Topical Review

BLUF: Physiotherapists will care for patients with active COVID-19 and those recovering from infection. This review, compiled by an international panel of experts, provides guidance for workforce planning and preparation as well the delivery of physiotherapy interventions. **Many of these important interventions and guidelines are described in the tables below.**

Abstract:
This document outlines recommendations for physiotherapy management for COVID-19 in the acute hospital setting. It includes: recommendations for physiotherapy workforce planning and preparation; a screening tool for determining requirement for physiotherapy; and recommendations for the selection of physiotherapy treatments and personal protective equipment. It is intended for use by physiotherapists and other relevant stakeholders in the acute care setting caring for adult patients with confirmed or suspected COVID-19.

Table 1
Screening guidelines for physiotherapy involvement with COVID-19.

Physiotherapy intervention	COVID-19 patient presentation (confirmed or suspected)	Physiotherapy referral
Respiratory	Mild symptoms without significant respiratory compromise (eg, fever, dry cough, no chest x-ray changes)	Physiotherapy interventions are not indicated for airway clearance or sputum samples[20] No physiotherapy contact with patient
	Pneumonia presenting with features: • a low-level oxygen requirement (eg, oxygen flow $\leq$ 5 l/min for $SpO_2 \geq 90\%$) • non-productive cough • or patient coughing and able to clear secretions independently	Physiotherapy interventions are not indicated for airway clearance or sputum samples No physiotherapy contact with patient
	Mild symptoms and/or pneumonia AND co-existing respiratory or neuromuscular comorbidity (eg, cystic fibrosis, neuromuscular disease, spinal cord injury, bronchiectasis, chronic obstructive pulmonary disease) AND current or anticipated difficulties with secretion clearance	Physiotherapy referral for airway clearance Staff use airborne precautions If not ventilated, where possible, the patient should wear a surgical mask during any physiotherapy
	Mild symptoms and/or pneumonia AND evidence of exudative consolidation with difficulty clearing or inability to clear secretions independently (eg, weak, ineffective and moist sounding cough, tactile fremitus on chest wall, wet sounding voice, audible transmitted sounds)	Physiotherapy referral for airway clearance Staff use airborne precautions If not ventilated, where possible, the patient should wear a surgical mask during any physiotherapy
	Severe symptoms suggestive of pneumonia/lower respiratory tract infection (eg, increasing oxygen requirements; fever; difficulty breathing; frequent, severe or productive coughing episodes; chest x-ray, CT or lung ultrasound changes consistent with consolidation)	Consider physiotherapy referral for airway clearance Physiotherapy may be indicated, particularly if weak cough, productive, evidence of pneumonia on imaging and/or secretion retention Staff use airborne precautions If not ventilated, where possible, the patient should wear a surgical mask during any physiotherapy Early optimisation of care and involvement of ICU is recommended
Mobilisation, exercise and rehabilitation	Any patient at significant risk of developing or with evidence of significant functional limitations • eg, patients who are frail or have multiple comorbidities impacting their independence • eg, mobilisation, exercise and rehabilitation in ICU patients with significant functional decline and/or (at risk of) ICU-acquired weakness	Physiotherapy referral Use droplet precautions Use airborne precautions if close contact required or possible aerosol generating procedures If not ventilated, where possible, the patient should wear a surgical mask during any physiotherapy

COVID-19 = coronavirus disease 2019, CT = computed tomography, ICU = intensive care unit, SpO_2 = oxyhaemoglobin saturation.

Box 3. Recommendations for physiotherapy respiratory interventions.

Personal protective equipment	
3.1	It is strongly recommended that airborne precautions are utilised during respiratory physiotherapy interventions.
Cough etiquette	
3.2	Both patients and staff should practise cough etiquette and hygiene. During techniques that may provoke a cough, education should be provided to enhance cough etiquette and hygiene: • Ask the patient to cover their cough by coughing into their elbow or sleeve or into a tissue. Tissues should then be disposed and hand hygiene performed. • In addition, if possible, physiotherapists should position themselves ≥ 2 m from the patient and out of the likely path of dispersion.
Aerosol-generating procedures	
3.3	Many respiratory physiotherapy interventions are potentially aerosol-generating procedures. While there are insufficient investigations confirming the aerosol-generating potential of various physiotherapy interventions,[25] the combination with cough for airway clearance makes all techniques potentially aerosol-generating procedures. These include: • cough-generating procedures (eg, cough or huff during treatment) • positioning or gravity-assisted drainage techniques and manual techniques (eg, expiratory vibrations, percussion and manually assisted cough) that may trigger a cough and sputum expectoration • use of positive pressure breathing devices (eg, inspiratory positive pressure breathing), mechanical insufflation-exsufflation devices, intra/extra pulmonary high-frequency oscillation devices (eg, The Vest, MetaNeb, Percussionaire) • PEP and oscillating PEP devices • bubble PEP • nasopharyngeal or oropharyngeal suctioning • manual hyperinflation • open suction • saline instillation via an open-circuit endotracheal tube • inspiratory muscle training, particularly if used with patients who are ventilated and disconnection from a breathing circuit is required • sputum inductions • any mobilisation or therapy that may result in coughing and expectoration of mucus Therefore, there is a risk of creating an airborne transmission of COVID-19 during treatments. Physiotherapists should weigh up the risk versus benefit in completing these interventions and use airborne precautions.
3.4	Where aerosol-generating procedures are indicated and considered essential they should be undertaken in a negative-pressure room, if available, or in a single room with the door closed. Only the minimum number of required staff should be present and they must all wear PPE, as described. Entry and exit from the room should be minimised during the procedure.[12] This may not be able to be maintained when cohorting is required because of the volume of patients presenting with COVID-19.
3.5	BubblePEP is not recommended for patients with COVID-19 because of uncertainty around the potential for aerosolisation, which is similar to the caution the WHO places on bubble CPAP.[23]
3.6	There is no evidence for incentive spirometry in patients with COVID-19.
3.7	Avoid the use of mechanical insufflation/exsufflation, non-invasive ventilation, inspiratory positive pressure breathing devices or high-flow nasal oxygen devices. However, if clinically indicated and alternative options have been ineffective, consult with both senior medical staff and infection prevention and monitoring services within local facilities prior to use. If used, ensure that machines can be decontaminated after use and protect machine with viral filters over machine and patient ends of circuits: • Use disposable circuits for these devices. • Maintain a log of devices that includes patient details for tracking and infection monitoring (if required). • Use airborne precautions.
3.8	Where respiratory equipment is used, whenever possible, use single-patient-use disposable options (eg, single-patient-use PEP devices). Re-usable respiratory equipment should be avoided where possible.
3.9	Physiotherapists should not implement humidification, non-invasive ventilation or other aerosol-generating procedures without consultation and agreement with a senior doctor (eg, medical consultant).
Sputum inductions	
3.10	Sputum inductions should not be performed.

Note: The entirety of this table is not pictured here, see full article for complete table.

Box 4. Recommendations for physiotherapy mobilisation, exercise and rehabilitation interventions.

Personal protective equipment	
4.1	Droplet precautions should be appropriate for the provision of mobilisation, exercise and rehabilitation in most circumstances. However, physiotherapists are likely to be in close contact with the patient (eg, for mobilisation, exercise or rehabilitation interventions that require assistance). In these cases, consider use of a high filtration mask (eg, P2/N95). Mobilisation and exercise may also result in the patient coughing or expectorating mucus, and there may be circuit disconnections with ventilated patients. Refer to local guidelines regarding ability to mobilise patients outside of their isolation room. If mobilising outside of the isolation room, ensure that the patient is wearing a surgical mask.
Screening	
4.2	Physiotherapists will actively screen and/or accept referrals for mobilisation, exercise and rehabilitation. When screening, discussion with nursing staff, the patient (eg, via phone) or family is recommended before deciding to enter the patient's isolation room. For example, to try to minimise staff who come in to contact with patients with COVID-19, physiotherapists may screen to determine an appropriate aid to trial. A trial of the aid may then be performed by the nursing staff already in an isolation room, with guidance provided, if needed, by the physiotherapist who is outside the room.
4.3	Direct physiotherapy interventions should only be considered when there are significant functional limitations, such as (risk of) ICU-acquired weakness, frailty, multiple comorbidities and advanced age.
Early mobilisation	
4.4	Early mobilisation is encouraged. Actively mobilise the patient early in the course of illness when safe to do so.[23]
4.5	Patients should be encouraged to maintain function as able within their rooms: • Sit out of bed. • Perform simple exercises and activities of daily living.
Mobilisation and exercise prescription	
4.6	Mobilisation and exercise prescription should involve careful consideration of the patient's state (eg, stable clinical presentation with stable respiratory and haemodynamic function).[26,27]
Mobility and exercise equipment	
4.7	The use of equipment should be carefully considered and discussed with local infection monitoring and prevention service staff before being used with patients with COVID-19 to ensure that it can be properly decontaminated.
4.8	Use equipment that can be single patient use. For example, use elastic resistance bands rather than distributing hand weights.
4.9	Larger equipment (eg, mobility aids, ergometers, chairs and tilt tables) must be easily decontaminated. Avoid use of specialised equipment, unless necessary, for basic functional tasks. For example, stretcher chairs or tilt tables may be deemed appropriate if they can be decontaminated with appropriate cleaning and are indicated for progression of sitting/standing.
4.10	When mobilisation, exercise or rehabilitation interventions are indicated: • Plan well. • Identify/use the minimum number of staff required to safely perform the activity.[26] • Ensure that all equipment is available and working before entering rooms. • Ensure that all equipment is appropriately cleaned or decontaminated. • If equipment needs to be shared among patients, clean and disinfect between each patient use.[23] • Specific staff training for cleaning of equipment within isolation rooms may be required. • Whenever possible, prevent the movement of equipment between infectious and non-infectious areas. • Whenever possible, keep dedicated equipment within the isolation zones, but avoid storing extraneous equipment within the patient's room.
4.11	When performing activities with ventilated patients or patients with a tracheostomy, ensure that airway security is considered and maintained (eg, a dedicated airway person to prevent inadvertent disconnection of ventilator connections/tubing).

COVID-19 = coronavirus disease 2019, ICU = intensive care unit.

Adjusting Practice during COVID-19

Acute care

Critical Care

Experience and suggestion of medical practices for burns during the outbreak of COVID-19.

Ma S, Yuan Z, Peng Y, Chen J, Li H, Luo Q, Song H, Xiang F, Tan J, Zhou J, Ning L, Hu G, Luo G.Ma S, et al.
Burns.
2020 Apr 2 2020; PMID: 32312568
Level of Evidence: 5 - Expert Opinion
Article Type: Editorial

BLUF: The authors provide guidelines for specific practices and situations in medical burn units during the COVID-19 outbreak. Suggestions include, but are not limited to, screening patient medical history, PPE for staff (with level of protection based on the patients' exposure to COVID-19), avoiding invasive operations, minimizing contact, establishing step operative programs, and similar recommendations for safely managing the patient.

Abstract: COVID-19 is spreading almost all over the world at present, which is caused by the 2019 novel coronavirus (2019-nCoV). It was an epidemic firstly in Hubei province of China. The Chinese government has formally set COVID-19 in the statutory notification and control system for infectious diseases according to the Law of the People's Republic of China on the Prevention and Treatment of Infectious Diseases. China currently is still struggling to respond to COVID-19 though intensive actions with progress made. The Burn Department of our hospital is one of sections with the highest infectious risk of COVID-19. **Based on our own experience and the guidelines on the diagnosis and treatment of COVID-19 (7th Version) with other regulations and literature, we describe our experience with suggestions for medical practices for burn units during the COVID-19 outbreak.** We hope these experiences and suggestions benefit our international colleagues during the pandemic of the COVID-19.

Family Member Visits to Critically Ill Patients During COVID-19: A New Pathway

Zhang J, Wang H, Dong L.Zhang J, et al.
Telemed J E Health. 2020 Apr 21; PMID: 32315253
Level of Evidence: 5 - Expert Opinion
Article Type: Letter to Editor

BLUF: The authors propose a telemedicine-based visiting protocol that incorporates social networking, mobile visitation through voice and video, and 5G+ virtual reality visitation.

Summary: The authors propose a new visiting protocol based on telemedicine so that critically ill patients may still receive family visits while preventing COVID-19 transmission. The authors outline the protocol as follows:

- **"Use of social-networking software based on voice and/or video to visit critically ill patients** (this not only avoids direct contact between patients and health professionals, but also could alleviate patient anxiety)"

- "**Use of a mobile visitation system based on voice and/or video to visit critically ill patients.** With the support of network video technology, voice and video communication via LAN is convenient and fast, and can effectively protect patients' privacy from being leaked. During the operation of the new pathway, patients and their families were very satisfied, and expressed their affirmation and support for the work of medical staff in intensive care units"
- "**Use of a 5G + virtual reality visitation system, opening up a new pathway for remote visits and expert consultation.** Under the 5G network, the system can realize bidirectional and real-time transmission of voice and video and support multi-terminal mode. It can also conduct panoramic observation with 360° field of vision and transform the range of sight at will."

Internal Medicine

Dermatology

Challenges of Covid-19 Pandemic for Dermatology.

Wollina, U.
Dermatol Ther.
2020 Apr 20; PMID: 32314460
Level of Evidence: 5 - Expert opinion
Type of Article: Review

BLUF: The dermatology field has an important role to play both for supporting preventive measures for healthcare staff to avoid dermatologic complications of the COVID-19 pandemic, as well as being available as specialists for the differential diagnosis of generalized rash with fever.

Abstract: SARS-CoV-2 is a new corona virus responsible for the pandemic named Coronavirus Disease 2019 (COVID-19). The disease causes severe acute respiratory syndromes with a significant morbidity and mortality. We provide a review with a focus on COVID-19 in dermatology. We discuss triage of suspected infectious patients, protection of medical doctors and nurses. We discuss the available data on cutaneous symptoms, although disease-specific symptoms have yet not been observed. COVID-19 is a challenge for the treatment of dermatologic patients, either with severe inflammatory disorders or with skin cancer. The consequences for systemic treatment are obvious but it will be most important to collect the clinical data for a better decision process. Last but not least education in dermatology for students will be temporarily not be possible in the classical settings. COVID-19, although not a skin disease by itself has an immense impact on dermatology.

Cardiology

The Obstacle Course of Reperfusion for STEMI in the COVID-19 Pandemics.

Roffi M, Guagliumi G, Ibanez B.
Circulation.
2020 Apr 21; PMID: 32315205
Level of Evidence: 5 - Expert Opinion
Type of Article: Correspondence

Summary: This article details the difficulties that providers (specifically those in Bergamo, Italy and Madrid, Spain) have been facing with giving reperfusion therapy to STEMI patients during the COVID-19 pandemic. Estimations put **perfusion therapy delay times as high as 60 minutes** due to COVID-19 precautions, significantly affecting the outcomes for many of these patients.

Changes to care include **increasing the frequency of fibrinolytic therapy** and **intubation of patients during transport** to prevent respiratory distress-related mortality in STEMI patients.

Neurology

The impact of COVID-19 on neurosurgeons and the strategy for triaging non-emergent operations: a global neurosurgery study.

Jean WC, Ironside NT, Sack KD, Felbaum DR, Syed HR
Acta Neurochir (Wien)
2020 Apr 21; PMID: 32314059
Level of Evidence: 5 - Survey
Type of Article: Research

BLUF: Using two consecutive surveys, the effects of COVID-19 on the practice and triaging of neurosurgical cases were examined. Neurosurgeons ranked nine scenarios with risk scores and urgency indexes, and the authors combined this data into an acuity index for each scenario to build a strategic scheme to assist in triaging (Table 5). Cerebellar metastasis and giant aneurysms have the highest risk of harm with postponement, and vestibular schwannoma has the lowest risk of harm with postponement (Figure 3).

ABSTRACT:
Object: The COVID-19 pandemic has disrupted all aspects of society globally. As healthcare resources had to be preserved for infected patients, and the risk of in-hospital procedures escalated for uninfected patients and staff, neurosurgeons around the world have had to postpone non-emergent procedures. Under these unprecedented conditions, the decision to defer cases became increasingly difficult as COVID-19 cases skyrocketed.
Methods: Data was collected by **self-reporting surveys** during two discrete periods: the principal survey accrued responses during **2 weeks at the peak of the global pandemic**, and the supplemental survey accrued responses **after that to detect changes in opinions and circumstances**. **Nine hypothetical surgical scenarios were used to query neurosurgeons' opinion on the risk of postponement and the urgency to re-schedule** the procedures. An acuity index was generated for each scenario, and this was used to rank the nine cases.
Results: There were **494 respondents** to the principal survey from 60 countries. **258 (52.5%) reported that all elective cases and clinics have been shut down** by their main hospital. A total of 226 respondents (46.1%) reported that their operative volume had dropped more than 50%. For the countries most affected by COVID-19, this proportion was 54.7%. There was a high degree of agreement among our respondents that **fast-evolving neuro-oncological cases are non-emergent cases that nonetheless have the highest risk in postponement**, and selected vascular cases may have high acuity as well.
Conclusion: We report on the impact of COVID-19 on neurosurgeons around the world. From their ranking of the nine case scenarios, we deduced a **strategic scheme** that can serve as a **guideline to triage non-emergent neurosurgical procedures** during the pandemic. With it, hopefully, neurosurgeons can continue to serve their patients without endangering them either neurologically or risking their exposure to the deadly virus.

Table 5 The acuity index was calculated by multiplying the average risk score (from the principal study) to the average urgency index (from the supplement study). The rank of the AI in the group of nine cases is shown in parenthesis. The PAI_{166} was calculated for each case as follows: for each respondent who identifiably completed both parts of the study, the risk score (principal phase) was multiplied to same respondent's urgency score for the same case (supplement phase) to generate a personal acuity index (PAI) for that case. The average for the 166 respondents was recorded under PAI_{166} (rank in parenthesis)

	Ave risk score ($n = 448$)	Ave urgency score ($n = 315$)	Acuity index (rank)	PAI_{166} (rank)
Cerebellar Met	3.51	4.22	14.8 (1)	15.5 (1)
Giant Aneurysm	3.50	3.96	13.9 (2)	13.9 (3)
GBM	3.39	3.86	13.1 (3)	14.2 (2)
Spinal Met	3.12	3.76	11.7 (4)	12.3 (4)
Carotid	3.14	3.45	10.8 (5)	10.9 (5)
C45 disc	2.81	3.09	8.68 (6)	8.73 (6)
Pituitary Tumor	2.68	2.80	7.50 (7)	7.87 (7)
AVM	2.70	2.48	6.70 (8)	6.67 (8)
VS	2.47	2.37	5.85 (9)	6.28 (9)

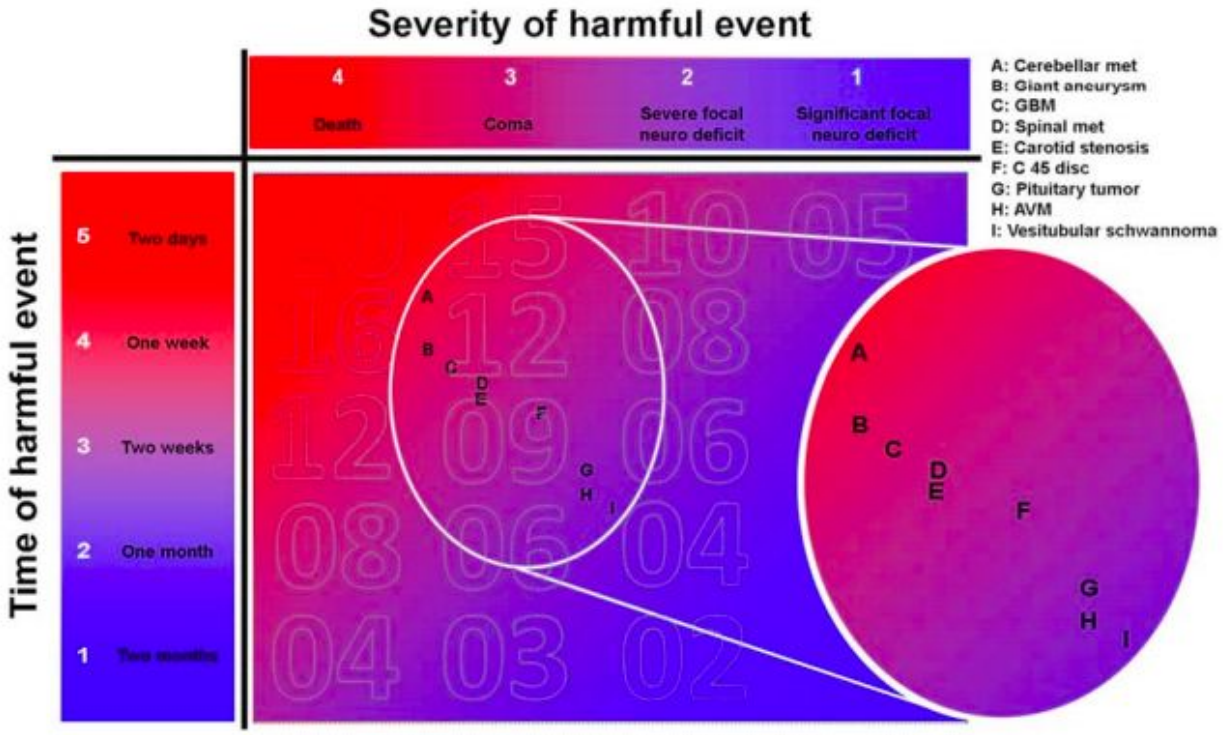


Fig. 3 A proposed strategic scheme. The scheme consists of two orthogonal lines of thinking, one related to the next predictable adverse event (either from disease progression or by chance), and the other related to the timing of this event. The nine case scenarios, A–I, are plotted onto the field according to the average "risk score" and "urgency score" generated from our study (Table 5). Numbers in field: estimated acuity index

Neurointervention for emergent large vessel occlusion during the covid-19 pandemic.

Fiorella D, Fargen KM, Leslie-Mazwi TM, Levitt M, Probst S, Bergese S, Hirsch JA, Albuquerque FC
J Neurointerv Surg
2020 Apr 20; PMID: 32312799
Level of Evidence: 5 - Expert Opinion
Type of Article: Editorial

BLUF: Recommendations regarding management of emergent large vessel occlusion (ELVO) include ensuring bed capacity remains in place for crtical neurointerventional patients, proper precautions for or avoidance of aerosolizing procedures such as intubation/extubation and nasal cannula oxygen, utilization of telemedicine when possible, and the importance of early symptom reporting and testing.

SUMMARY: Mechanical thrombectomy (MT) reduces morbidity and mortality in patients with emergent large vessel occlusion (ELVO) ischemic strokes. With redeployment of medical personnel and redistribution of supplies, it is important to **ensure beds and resources will remain available for critical neurointerventional patients, including ELVO**. General anesthesia has several advantages and has been proven to improve patient outcomes, but intubation and extubation are highly aerosolizing procedures. The highest concentration of airborne SARS-CoV-2 particles were recorded while a patient was receiving oxygen through a nasal cannula, so **if MT will be performed using conscious sedation, nasal cannula should be avoided.** Family updates and consent procedures may need to be conducted via telephone. Along with the necessity for early report of symptoms and testing, results should be shared with exposed medical personnel, whether negative or positive.

Neurology in the time of covid-19.

Mani, Hadi; Carr, Aisling S; Brownlee, Wallace J; Lunn, Michael P
J Neuro/Neurosurg Psychiatry
2020 Apr 22; PMID: 32312872
Level of Evidence: 5 - Expert Opinion
Type of Article: Comment

BLUF: This commentary provides insights for neurologists regarding neurologic complications, the role for neurology during the pandemic, and considerations for patients with neurologic disease during this pandemic.

Summary with excerpts:
For Neurologists:

- "It will be necessary to try and differentiate any direct effects of the virus against the effects of systemic illness on the nervous system. This includes complications due to hypoxia, sepsis, secondary hypercoagulable states and disseminated intravascular coagulation.
- Other variables that will need consideration are drug toxicities and inherent morbidities due to prolonged stay on intensive care such as critical care neuromyopathy."

Caring for Neurology Patients:

- "Patients with respiratory insufficiency from neuromuscular weakness or musculoskeletal limitations such as kyphoscoliosis are likely to be at higher risk in severe covid-19 infection."
- "Broad-spectrum high potency immunosuppressants such as cyclophosphamide, alemtuzumab and the anti-CD20 monoclonals are very likely to be high risk for infection and poor antiviral response."
- "The more commonly used oral immunosuppressants have to be assumed to be a risk but in some series no additional risk is identified."

ENT/Otolaryngology

Ethical questions related to Covid-19 and ENT practice

Simon, F
Eur Ann Otorhinolaryngol Head Neck Dis
2020 Apr 15; PMID: 32312621
Level of Evidence: 5 - Expert Opinion
Type of Article: Editorial

Summary: the author discusses the ways in which otolaryngology is impacted by the coronavirus pandemic and the ethics behind continuing or stopping certain procedures and office visits due to the difficulty of maintaining provider and patient safety.

Ophthalmology

Reorganize and survive-a recommendation for healthcare services affected by COVID-19-the ophthalmology experience.

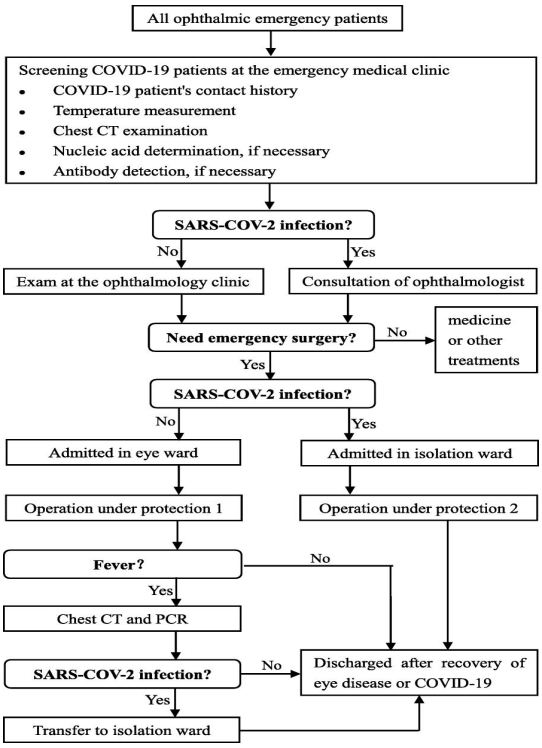
Petrovski BÉ, Lumi X, Znaor L, Ivastinović D, Confalonieri F, Petrovič MG, Petrovski G.Petrovski BÉ, et al.
Eye (Lond).
2020 Apr 20; PMID: 32313170
Level of Evidence: 5 – Expert Opinion
Article Type: Editorial

Summarizing excerpt: "a working cycle equal to the incubation period or cycle of any infectious disease type can be implemented… This would allow half of the healthcare staff remaining unexposed or passing the incubation time in isolation, while the other half keeping the frontline and the healthcare services from collapse."

Practical experience on emergency ophthalmic surgery during the prevalence of COVID-19.

Du H, Zhang M, Zhang H, Sun X.Du H, et al.
Graefes Arch Clin Exp Ophthalmol.
2020 Apr 20; PMID: 32314033
Level of Evidence: 5N/A – Expert opinion
Article Type: Editorial

Summary: Authors from the Department of Ophthalmology in Tongji Hospital in Wuhan City detail measures taken by their facility that resulted in zero transmission of coronavirus from patients to providers. They note the importance of judicious PPE, hand-washing, and limiting surgeries only to emergencies (glaucoma, emergency vitrectomy, debridement suture surgery, and treatment of retinopathy in preterm infants).



Gastroenterology

Covid-19 infection in Crohn's disease under treatment with adalimumab.

Tursi A, Angarano G, Monno L, Saracino A, Signorile F, Ricciaridi A, Papa A.
Gut.
2020 Apr 20; PMIDD: 32312788
Level of Evidence: 4 – Case Report
Type of Article: Letter

BLUF: Rapid clinical improvement with oxygen therapy alone was observed in a patient with Crohn's disease under treatment with adalimumab, and no gastrointestinal symptoms were recorded. Though adalimumab was suspended upon COVID-19 test confirmation, it exhibits a long (20 day) half life, helping characterize effects of this drug on COVID-19 course.

Summary:
Patients receiving immunosuppressive-immunomodulating therapy may be quite vulnerable in the COVID-19 pandemic, such as those with Crohn's disease. Past studies have characterized less common gastrointestinal symptoms observed in some patients with COVID-19; these findings may suggest that patients with pre-existing intestinal disease (particularly, Crohn's disease) may be subject to worsening disease. However, in a **30-year-old male patient with Crohn's disease** reported herein, **no abdominal pain or changes in bowel habits were reported, and the patient improved rapidly.** Adalimumab therapy was promptly suspended after COVID-19 positive results were detected. Additional large epidemiological studies are warranted to determine the impact of adalimumab therapy on disease progression.

Immunology

COVID-19 in a High-Risk Dual Heart and Kidney Transplant Recipient.

Hsu JJ, Gaynor P, Kamath M, Fan A, Al-Saffar F, Cruz D, Nsair A.
Am J Transplant.
2020 Apr 21; PMID: 32315122
Level of Evidence: 5 – Case Report
Type of Article: Case Report

BLUF: A 39-year-old male **dual heart and kidney recipient** presented with **classic symptoms of COVID-19** (despite immunosuppressive status) and had a **relatively benign disease course** (despite three immunosuppressive agents and two solid organ grafts) with **no evidence of rejection**, which aligns to previous reports of SARS-CoV-2 infection in solid-organ transplant recipients.

Abstract:
The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is rapidly infecting people worldwide, resulting in the infectious disease coronavirus disease 19 (COVID-19) that has been declared a pandemic. Much remains unknown about COVID-19, including its effects on solid organ transplant (SOT) recipients. Given their immunosuppressed state, SOT recipients are presumed to be at high risk of complications with viral infections such as SARS-CoV-2. Limited case reports in single SOT recipients, however, have not suggested a particularly severe course in this population. In this report, **we present a dual-organ (heart/kidney) transplant recipient who was found to have COVID-19** and, **despite the presence of a number of risk factors for poor outcomes, had a relatively mild clinical course.**

Oncology

Advice Regarding Systemic Therapy in Patients with Urological Cancers During the COVID-19 Pandemic.

Gillessen S, Powles T.Gillessen S, et al.
Eur Urol.
2020 Apr 17; PMID: 32312544
Level of Evidence: 5 - Expert Opinion
Article Type: Editorial

Abstract: The risk/benefit ratio of a number of palliative and (neo)adjuvant treatments should be reconsidered during the COVID-19 pandemic. We provide treatment advice as a pragmatic perspective on the risk/benefit ratio in specific clinical scenarios:

Table 1 – Overview of suggestions regarding systemic therapy.

	Prostate cancer	Renal cancer	Germ cell cancer cancer	Urothelial cancer
1. Treatment should be commenced where possible	Frontline treatment for metastatic disease	Treatment for frontline IMDC intermediate- and poor-risk disease metastatic disease[a]	Treatment with curative intent	First-line treatment for metastatic disease
2. Treatment should not be commenced without justification	CTx in patients at significant COVID-19–related risk[b]	Nephrectomy for metastatic disease	Adjuvant therapy after orchidectomy for stage I disease	CTx in platinum-refractory disease Perioperative CTx for operable disease[c]
3. Treatment should not be stopped without justification	AR-targeted therapy[d]	Treatment for frontline metastatic disease	First- and second-line treatment for metastatic disease	Treatment for front line metastatic disease
4. Treatment that can potentially be stopped or delayed after careful consideration[e]	Minimising the number of CTx cycles or prolonging cycle length may be justified Steroids as a cancer therapy	ICI or oral VEGF-targeted therapy after prolonged period (1–2 yr)[d]		CTx for platinum refractory patients who are not responding to therapy More than 3 CTx cycles in the perioperative stetting
5. Treatments that can be given preferentially compared to other options	Oral AR-targeted therapy rather than CTx[f]	Oral VEGF therapy rather than IV immune therapy	Conventional dose rather than high-dose therapy	ICIs rather than CTx in PD-L1–positive frontline metastatic disease

AR = androgen receptor; CTx = chemotherapy; ICI = immune checkpoint inhibitor; IMDC = International Metastatic Renal Cell Carcinoma Database Consortium; IV = intravenous.
[a] Oral VEGF-targeted therapy rather than IV ICIs may be attractive as it requires less health care interactions and resources.
[b] Younger cancer patients and those without comorbidities may be at lower risk, which should be considered.
[c] Neoadjuvant chemotherapy may be helpful in bridging time to surgery in cases in which elective surgery is not possible.
[d] Regimens with a longer interval (4-weekly nivolumab or 6-weekly pembrolizumab) should be used where possible.
[e] Palliative CTx was tested with a specific number of cycles. The risk associated with stopping before this has not been assessed, nor of the principles of delaying chemotherapy. There are subgroups of prostate and urothelial cancer patients for whom continuing CTx to the full number of cycles may be associated with more risk than benefit. Patients will need to participate in this discussion.
[f] Assuming similar efficacy between the regimens.

COVID-19 More Frequent, Severe in Cancer Patients.

No authors listed
Cancer Discov.
2020 Apr 20; PMID: 32312714
Level of Evidence: 5 - Expert Opinion
Type of Article: Comment

Summary: Backed by experts in the American Association of Cancer Research (AACR), this article discusses two research projects done in China (one in Zhongnan Hospital of Wuhan University and the other in the First Affiliated Hospital of Guanzhou Medical University) that suggest **higher incidence and severity of COVID-19** in cancer patients. The proposed mechanism is a suppressed immune system and the unfortunate reality that many lung cancers are linked to long-term tobacco use and subsequently respiratory compromise

Prevention and control strategies for the diagnosis and treatment of cancer patients during the COVID-19 pandemic.

Tan J, Yang C
Br J Cancer
2020 Apr 20; PMID: 32313215
Level of Evidence: 5-Expert opinion
Type of Article: Comment

Summary: Suggested guidelines on how to prevent Covid-19 infection in cancer patients:

- **Surgeries**
  - Emergent surgeries should continue
  - Confined surgeries with adjuvant chemo should continue where possible
  - Radical surgeries should be postponed
- **Radiotherapy and chemotherapy**
  - Radiotherapy and high dose chemotherapy should be avoided where possible
  - Dose reduction chemotherapy may be considered
- Clinics should have a separate physical location for possible Covid-19 patients
- **Trials**
  - New clinical trials should not be initiated
  - Ongoing trials can continue with an emphasis on screening for Covid-19 symptoms where in person contact is absolutely necessary
- Patients should use local hospitals when possible

Radiation Therapy in King County, Washington During the COVID-19 Pandemic: Balancing Patient Care, Transmission Mitigation, and Resident Training.

Dinh TT, Halasz LM, Ford E, Rengan R.Dinh TT, et al.
Adv Radiat Oncol.
2020 Mar 27; PMID: 32313845
Level of Evidence: Level 5 - Expert Opinion
Type of Article: Brief Opinion

BLUF: This article documents the experience and strategies utilized by one academic radiation-oncology department to continue providing care and resident education during the COVID-19 pandemic.

Summary: The article summarizes the experience of an academic radiation oncology department in their approach to providing care during the COVID-19 pandemic. They had three goals - “social distancing, preservation of the pool of health care providers, and conservation of personal protection equipment.” Strategies employed include **encouraging staff to work from home** whenever possible, **widespread implementation of HIPAA-compliant videoconferences**, **deferral of some new patients** with benign or indolent conditions, screening staff and patients for signs or symptoms, **treating COVID-19 positive patients in one designated space at a certain time**, developing new protocols for protecting/disinfecting equipment used in treatment, s**hifting education of resident physicians toward videoconferencing**, and encouraging residents to remain home if feel ill.

The Technique and Justification for Minimally Invasive Surgery in COVID-19 Pandemic: Laparoscopic Anterior Resection for Near Obstructed Rectal Carcinoma.

Pawar T, Pokharkar A, Gori J, Pandey D, Rohila J, Dsouza A, Saklani A.
J Laparoendosc Adv Surg Tech A
2020 Apr 20; PMID: 32315244
Level of Evidence: 5 – Case Study
Type of Article: Letter

BLUF: The authors argue laparoscopy to be a non-inferior option to open procedures as long as precautions are taken to minimize aerosol generation.

Summary: Currently, there is no solid evidence to suggest viral transmission through surgical smoke. The authors present the case of a laparoscopic anterior resection for near obstructed rectal carcinoma in which they took the following precautions:

- All OR staff used N95 masks and eye-protecting visors
- Cautery settings placed at 20
- All ports inserted snugly and taking care to avoid any peripheral air leak.
- Harmonic use was limited as much as possible to avoid aerosol generation
- Used airseal filtration system for smoke evacuation
- Tubing from air seal was applied to one port and HEPA filter was applied to another port. Airseal safe evacuation mode was selected for the procedure

Radiology

The Prevention and Management of the Coronavirus Disease 2019 (COVID-19) Outbreak in Radiology Departments in Epidemic Areas

Deng M
Jpn J Radiol
2020 Apr 18; PMID: 32306166
Level of Evidence: 5 – Protocol
Type of Article: Review

BLUF: This article describes a **protocol to outfit radiology departments** and protect staff in the event of a local surge in COVID-19 case load. The protocol is based on the six iterations of protocols from the radiology department at Zhongnan Hospital in Wuhan, China. Specific recommended measures include **tiered PPE protection levels** based on degree on patient contact, rigorous **training** in and **individual evaluation of disinfection** procedures, **estimation of equipment throughput** under increased protective stringency and patient load, and **separation of foot traffic to minimize SARS-CoV-2 exposure** to healthcare workers and uninfected persons.

Abstract:
This review based on the actual results of epidemic prevention management in radiology departments in epidemic areas, and using designated hospital management methods, to summarize the radiology protection system. With the cooperation of the whole hospital and radiology department, a number of effective evaluation methods have been carried out to ensure the optimization of clinical protection. These practical methods provide a basis for the further promotion of management strategies and reduction of nosocomial infection. To our knowledge, the establishment of standardized protection and clear process has opened up a new idea of epidemic prevention management, which can

effectively provide timely, efficient, and accurate support for clinical research, and promote the transformation from clinical research type to scientific research management type.

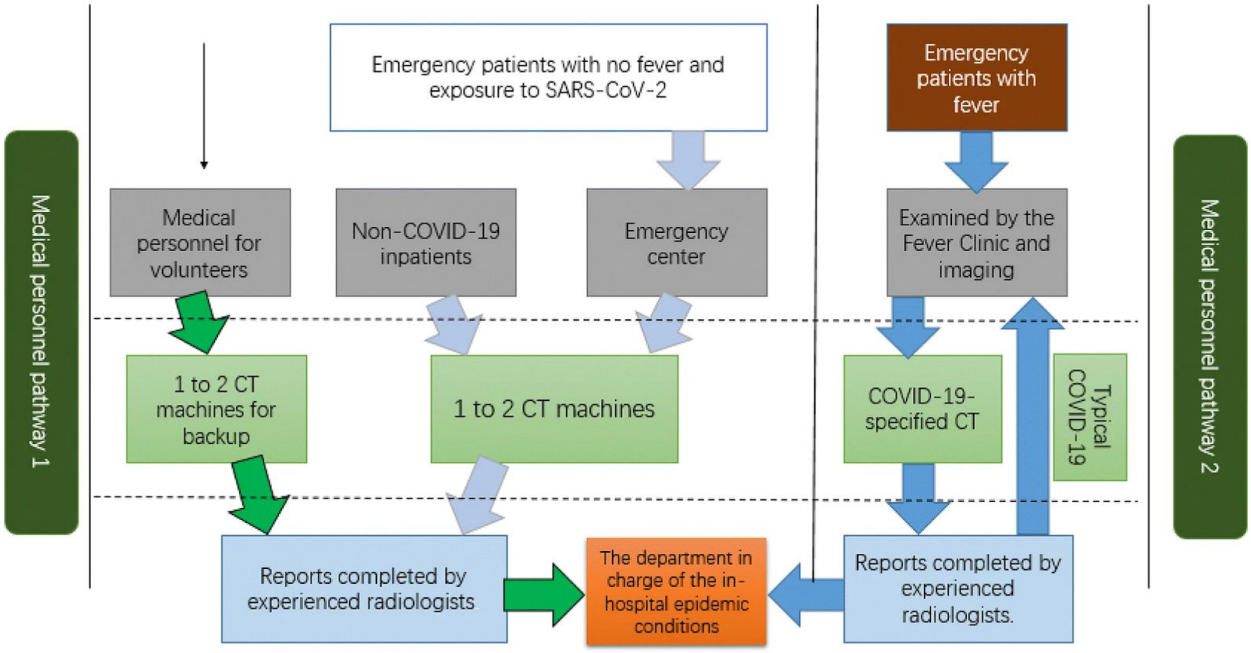


Figure 1. Flowchart of radiology and imaging work during the epidemic period

Surgery

General

Practical Implications of Novel Coronavirus COVID-19 on Hospital Operations, Board Certification, and Medical Education in Surgery in the USA.

Fong ZV, Qadan M, McKinney R Jr, Griggs CL, Shah PC, Buyske J, Sachdeva AK, et al.
J Gastrointest Surg.
2020 Apr 20.; PMID: 32314235
Level of Evidence: 5 - Expert Opinion
Article type: Letter

Summary: The authors provide clarification, reassurance, and guidelines representing the Society for Surgery of the Alimentary Tract (SSAT). They suggest the following laparoscopic practices in COVID-19 unknown patients:

1. Low pressure pneumoperitoneum—use the minimum pressure that allows safe conduct of the operation, 10–12 mm/Hg is usually sufficient
2. Sealing all trocar/port valves except those used for insufflation and smoke evacuation.
3. Use of an active smoke evacuation system within a line or receptacle filter.
4. Evacuating carbon dioxide pneumoperitoneum through a 0.1-µm filtered filter prior to trocar removal/specimen extraction.

Transplant programmes during COVID-19: Unintended consequences for health inequality.

Sharma S, Lawrence C, Giovinazzo F.
Am J Transplant.
2020 Apr 20; PMID: 32314551
Level of Evidence: 6 – No data
Type of Article: Letter to the Editor
BLUF: Transplant candidates and recipients may be subject to considerable health consequences amid changing management criteria from transplant centers; **wide dissemination of information and resources for these patients may reduce these health inequalities.**

Abstract:
Transplant programmes are being scaled back as healthcare systems worldwide respond to COVID-19. Most centres are now taking only super urgent and urgent cases, if at all. Management of donor organs is also impacted. Contingency protocols may prioritise distance over equitable sharing principles. Live and deceased donation is either being selectively paused or operating under stringent criteria based on local capacity. This will inevitably lead to variable patient experience.

Guidelines for the management of surgical departments in non-uniform hospitals during the COVID-19 pandemic.

Mitura K, Myśliwiec P, Rogula W, Solecki M, Furtak JP, Kazanowski M, Kłęk S, Nowakowski M, Pędziwiatr M, Zawadzki M, Wallner G, Sobocki J.
Pol Przegl Chir
2020 Apr 15; PMID: 32312919
Level of Evidence: Article not able to be accessed to be verified.
Type of Article: Article not able to be accessed to be verified.
Summary: Article not able to be accessed to be verified.

Abstract: In the last several weeks we have been witnessing the exponentially progressing pandemic SARS-CoV-2 coronavirus. As the number of people infected with SARS-CoV2 escalates, the problem of surgical management of patients requiring urgent surgery is increasing. Patients infected with SARS-CoV2 virus but with negative test results will appear in general hospitals and may pose a risk to other patients and hospital staff. Health care workers constitutes nearly 17% of infected population in Poland, therefore early identification of infected people becomes a priority to protect human resources and to ensure continuity of the access to a surgical care. Both surgical operations, and endoscopic procedures are considered as interventions with an increased risk of infection. Therefore, determining the algorithm becomes crucial for qualifying patients for surgical treatment, but also to stratify the risk of personnel being infected during surgery and to adequately protect staff. Each hospital should be logistically prepared for the need to perform urgent surgery on a patient with suspected or confirmed infection, including personal protective equipment. Limited availability of the equipment, working under pressure and staff shortages in addition to a highly contagious pathogen necessitate a pragmatic management of human resources in health care. Instant synchronized action is needed, and clear uniform guidelines are essential for the healthcare system to provide citizens with the necessary surgical care while protecting both patients, and staff. This document presents current recommendations regarding surgery during the COVID-19 pandemic in Poland.

Operating during the COVID-19 pandemic: How to reduce medical error.

Ellis R, Hay-David AGC, Brennan PA
Br J Oral Maxillofac Surg

2020 Apr 13; PMID: 32312584
Level of Evidence: 5- Expert opinion
Type of Article: Guidelines
Summary: As the UK's NHS restructures itself during this pandemic many healthcare workers find themselves in unfamiliar settings. The authors offer **online resources for surgeons working outside the operating theater** (www.ics.ac.uk/ICS/handbooks.aspx , START, and NOTSS courses) and suggestions for how to avoid surgical errors despite changing circumstances, settings, and personnel. They **urge increased attention to "human factors" including communication strategies like closed loop communication and pre-operative briefs,** as well as active efforts to combat dehydration, hunger, and lack of sleep, and early use of resources to combat burnout.

Abstract
Our professional and private lives changed on March 11 2020 when the coronavirus disease 2019 (COVID-19) was declared a pandemic by the WHO. By March 16, surgical training was suspended, MRCS and FRCS examinations cancelled and all courses postponed. In theory, essential cancer surgery, emergency and trauma operating will continue. All elective, non-essential cases are currently cancelled. While we adapt to our new ways of working, we remind ourselves that surgeons are flexible, resilient and, ultimately, we are doctors in the first instance. We present a short article on operating during the COVID-19 pandemic.

ENT/otolaryngology

Flexible Laryngoscopy and COVID-19.

Rameau A, Young VN, Amin MR, Sulica L.
Otolaryngol Head Neck Surg.
2020 Apr 21, PMID: 32312166
Level of Evidence: 5 - Expert Opinion
Article Type: Commentary
BLUF: Laryngoscope should only be used in critical cases once COVID-19 testing has been done to ensure proper safety measures and protection of the otolaryngologist.

Abstract: Flexible laryngoscopy, the gold-standard evaluation of the larynx and the pharynx, is one of the most commonly performed procedures in otolaryngology. During the coronavirus disease 2019 (COVID-19) pandemic, flexible laryngoscopy represents a risk for patients and an occupational hazard for otolaryngologists and any clinic staff involved with the procedure or endoscope reprocessing. Here we present a set of recommendations on flexible laryngoscopy performance during the pandemic, including patient selection, personal protective equipment, and endoscope disinfection, based on a consensus reached during a virtual webinar on March 24, 2020, attended by approximately 300 participants from the American laryngology community.

Cardiothoracic

Challenges in Heart Transplantation in the Era of COVID-19.

DeFilippis EM, Farr MA, Givertz MM.
Circulation.
2020 Apr 21; PMID: 32314596
Level of Evidence: 6 – No data
Type of Article: Correspondence

BLUF: Heart transplant programs are optimizing clinician, candidate, and recipient safety with preventive measures **such as reducing transplant volume, increasing donor COVID-19 testing, and utilization of telemedicine for follow up** amidst the ongoing pandemic, yet long-term consequences of these measures remain unknown.

Summary: The COVID-19 pandemic has unique implications on heart transplant candidates and recipients who theoretically face greater risk of infection and severe disease progression. Experience in treating heart transplant recipients with SARS-CoV-2 infection is limited to few documented case reports. Programs should weigh the waitlist mortality risk-benefit ratio when listing patients for transplant. Centers should reduce their transplant volume to meet ICU bed, staffing, and medical equipment needs. Donors are increasingly undergoing COVID-19 testing to exclude disease prior to transplant. Additional preventive measures are underway for clinicians and transplant recipients in the postoperative period. Non-invasive monitoring is now conducted through telemedicine visits, while procedures for identifying graft rejection (eg, right heart catheterization and endomyocardial biopsy) are deemed non-urgent. The long-term effect on rates of rejection or cardiac allograft vasculopathy in these recipients is to be determined. **Many questions remain unanswered as far as implications of the pandemic on heart and other solid-organ transplant recipients.**

Orthopedics

Orthopedic surgery post COVID-19: an opportunity for innovation and transformation

Menendez, Mariano E; Jawa, Andrew; Haas, Derek A; Warner, Jon J P; Codman Shoulder Society
J Shoulder Elbow Surg
2020 Apr 3; PMID: 32312643
Level of Evidence: 5 - Mechanism-Based Reasoning
Type of Article: Commentary

Summary: The writers of this article detail a list of tools for orthopedic surgeons to use in their practice, and principles to follow considering how the field of orthopedics may change permanently after the coronavirus pandemic, such as more use of telemedicine tools and changes to where surgery is performed.

Trauma and orthopaedics in the COVID-19 pandemic: breaking every wave.

Tay KJD, Lee YHD.Tay KJD, et al.
Singapore Med J.
2020 Apr 21.; PMID: 32312024
Level of Evidence: 5 - Expert Opinion
Article Type: Commentary

BLUF: Orthopedic departments in Singapore describe the changes in their organizational structure during COVID-19 as three waves:

1. Visitation restrictions, screening, and PPE precautions
2. Reduced elective surgery and limited pre and post hospital stay length
3. Cancellation of all non urgent procedures.

Summary: "During this pandemic, orthopaedic departments in Singapore have to frequently calibrate and re-calibrate their organisational structure and clinical operations as the crisis evolves." The authors describe this adapting organizational structure utilizing the "3 waves" of the COVID-19

pandemic in Singapore. During the first wave, hospitals commenced visitation restrictions, screening of patients was implemented, large departments began dividing into individual teams, and staff began wearing PPE including surgical masks, N95 masks, and face shields. The "second wave" led to reduced elective surgeries in all orthopaedic departments and limiting patient time in the hospital pre- and post- surgery. Staff were redistributed to different departments based on manpower needs. In the "third wave," the present wave of the pandemic, all non-urgent procedures were cancelled. The authors conclude the article with recommendations to mitigate this present wave, **such as practicing increased distancing between staff, screening patients prior to orthopaedic surgery, and creating designated surgical teams.**

OBGYN

Contraception in the Era of COVID-19.

Nanda K, Lebetkin E, Steiner MJ, Yacobson I, Dorflinger LJ.Nanda K, et al.
Glob Health Sci Pract.
2020 Apr 20; PMID: 32312738
Level of Evidence: 5 - Expert Opinion
Type of Article: Commentary

Summary: Reproductive health is an essential service to women and girls during the COVID-19 pandemic. As "globally, approximately 50% of pregnancies are unintended," leading to unsafe abortion practices or serious pregancy complications. This article recognizes WHO's recommendation for social distancing, by suggesting telehealth for counseling, screening and education on contraceptive use. In addition, how to optimize patient access to contraceptive methods and how to make considerations for postpartum women to continue maintaining quality and access to care.

Pediatrics

Managing a tertiary-level NICU in the time of COVID-19: Lessons learned from a high-risk zone.

Cavicchiolo ME, Lolli E, Trevisanuto D, Baraldi E.
Pediatr Pulmonol
2020 Apr 21; PMID: 32315113
Level of Evidence: 5 – Expert Opinion
Type of Article: Letter to Editor

Summary: This tertiary-level NICU in Italy has opted for heightened surveillance, testing all admitted newborns, their parents, and healthcare providers. All healthcare providers and parents are tested weekly. Newborns are isolated in thermostat-controlled cribs and parents' visits are restricted to 2hrs/day and 1 parent/baby. Preterm babies born from COVID-19 positive mothers are isolated in a dedicated area.

Psychiatry

Medically unexplained symptoms in the times of Covid-19 pandemic: a case-report.

Colizzi M, Bortoletto R, Silvestri M, Mondini F, Puttini E, Cainelli C, Gaudino R, Ruggeri M, Zoccante L.

Brain Behav Immun Health
2020 Apr 19; PMID: 32313886
Level of Evidence: 4 – Case Report
Type of Article: Short Communication

BLUF: It is important to keep psychiatric illnesses such as Somatic Symptom Disorder (SSD) in mind when assessing patients, particularly adolescents, for COVID-19. Previous psychiatric disorders can be triggered by fear and manifest similarly to COVID-19.

Abstract:
In early 2020, a novel coronavirus (SARS-CoV-2) leading to a potentially fatal condition was discovered. Since then, the 2019 coronavirus disease (COVID-19) has spread worldwide becoming a pandemic. Beyond the risks strictly related to the infection, concerns have been expressed for the psychological impact that COVID-19 may have, especially on vulnerable individuals with pre-existing mental health conditions. Somatic symptom disorder (SSD) is characterized by a dysfunctional preoccupation with physical symptoms leading to excessive and unnecessary healthcare utilization. Despite being quite common, such condition remains underrecognized. We report a **detailed clinical case of a 16 years old adolescent, who presented with a history suggestive of COVID-19 infection and associated psychological distress**. **Despite testing negative for the presence of SARS-CoV-2, his extreme and persisting health preoccupations required an inpatient admission to the Child and Adolescent Neuropsychiatric Unit**. He responded rapidly to a low dose of antipsychotic and an antidepressant. Based on his medical history and current presentation, he received a diagnosis of SSD. **When COVID-19-like symptoms occur, we highlight the importance of differentially diagnosing a possible exacerbation of a pre-existing SSD, triggered by fear of being infected. This may help preventing further burden to the healthcare system**

R&D: Diagnosis & Treatments

Current Diagnostics

CT imaging features of 4,121 patients with COVID-19: a meta-analysis.

Zhu, Jieyun; Zhong, Zhimei; Li, Hongyuan; Ji, Pan; Pang, Jielong; Li, Bocheng; Zhang, Jianfeng
Journal of Medical Virology
April 21st, 2020; PMID: 32314805
Level of Evidence: Level 1- Meta-analysis
Type of Article: Letter

Summary: Researchers conducted a meta-analysis including 34 retrospective studies with a total of 4,121 COVID-19 patients, evaluating specific findings on chest CT to aid in diagnosis and detection of disease progression. Significant findings are summarized below:

Lesion Distribution
- 73.8% had bilateral lung involvement
- 67.3% had multilobar involvement

Lesion Shape
- 40.3% had patchy infiltrates
- 39.5% had spider web sign

Lesion Density
- 68.1% had ground glass opacities
- 44.7% included air bronchogram sign
- 32% had consolidation

Accompanying Signs
- 27.1% had pleural thickening

Abstract:
Objective: We systematically reviewed the CT imaging features of COVID-19 in order to provide reference for clinical practice.
Methods: Our article comprehensively searched PubMed, FMRS, EMbase, CNKI,WanFang databases and VIP databases to collect literatures about the CT imaging features of COVID-19 from 1 January 2020 to 16 March 2020. Three reviewers independently screened literature, extracted data and assessed the risk of bias of included studies, and then, this meta-analysis was performed by using Stata12.0 software.
Results: 34 retrospective studies involving a total of 4 121 COVID-19 patients were included. The results of meta-analysis showed that most patients presented bilateral lung involvement (73.8%, 95%CI: 65.9%-81.1%) or multilobar involvement (67.3%,95%CI: 54.8%-78.7 %) and just a little patients showed normal CT findings (8.4%). We found that the most common changes in lesion density was ground-glass opacities (68.1%,95%CI: 56.9%-78.2%). Other changes in density included air bronchogram sign(44.7%), crazy-paving pattern (35.6%) and consolidation (32.0%). Patchy (40.3%), spider web sign (39.5%), cord-like (36.8%) and nodular (20.5%) were common lesion shapes in COVID-19 patients. Pleural thickening (27.1%) was found in some patients. Lymphadenopathy(5.4%) and pleural effusion (5.3%) were rare.
Conclusion: The lung lesions of patients with COVID-19 were **mostly bilateral** lungs or multilobar involved. The **most common chest CT findings were patchy and ground-glass opacities.** Some patients had air bronchogram, spider web sign and cord-like. Lymphadenopathy and pleural effusion were rare.

Chest CT in patients suspected of COVID-19 infection: A reliable alternative for RT-PCR

Majidi, Hadi; Niksolat, Fatemeh
Am J Emerg Med
2020 Apr 8; PMID: 32312575
Level of Evidence: 5 - Mechanism-Based Reasoning
Type of Article: Letter
Summary: The authors evaluate the use of CT scans for detecting pulmonary lesions in COVID-19 and suggest it's use when there is no test for COVID-19, while also discussing limitations, cost, and risk associated when using this modality to diagnose COVID-19.

A Review of Salivary Diagnostics and Its Potential Implication in Detection of Covid-19

Sri Santosh, Tatikonda; Parmar, Reshu; Anand, Hanish; Srikanth, Konkati; Saritha, Madham
Cureus
2020 Apr 17; PMID: 32313785
Level of Evidence: 5 – Expert Opinion
Type of Article: Correspondence
BLUF: Salivary diagnostics is cheap, non-invasive, and minimizes risk of transmission to health care workers. It can be used both for diagnosis and monitoring of respiratory viruses including SARS-CoV which is detected in high titers in saliva.

Abstract:
Saliva is an exocrine secretion produced from the salivary glands and has numerous functions, such as cleansing and protection of the oral cavity, antimicrobial effects and aids in digestion. Due to the speedy development in the field of salivaomics, saliva is now well accepted as a pool of biological markers that vary from changes in biochemicals, nucleic acids and proteins to the microflora. **Saliva has an immense potential as a diagnostic fluid and offers an edge over other biological fluids as its collection method does not require invasive procedure, economical and is useful for monitoring systemic health.** Development of sensitive and precise salivary diagnostic tools and the formulation of defined guidelines following meticulous testing will allow salivary diagnostics to be utilised as chair side tests for various oral and systemic diseases in the near future. The coronavirus disease (Covid-19) pandemic is the biggest challenge and global health crisis for the world since World War Two. Rapid and accurate diagnosis of Covid-19 is crucial in controlling the outbreak in the community and in hospitals. Nasopharyngeal and oropharyngeal swabs are the recommended specimen types for Covid-19 diagnostic testing. The collection of these specimen types requires close contact between healthcare workers and patients and poses a risk of transmission of the virus, causes discomfort and may cause bleeding, especially in patients with condition such as thrombocytopenia. Hence, nasopharyngeal or oropharyngeal swabs are not desirable for sequential monitoring of viral load. Saliva specimens can be obtained easily as the patient is asked to spit into a sterile bottle**. The collection of saliva is non-invasive and greatly minimizes the exposure of healthcare workers to Covid-19.** Saliva has a high consistency rate of greater than 90% with nasopharyngeal specimens in the detection of respiratory viruses, including coronaviruses. Saliva has also been used in screening respiratory viruses among hospitalized patients without pyrexia or respiratory symptoms. SARS-CoV can be detected in saliva at high titers. **Salivary diagnostics is a dynamic field that is being incorporated as part of disease diagnosis, clinical monitoring of systemic health and to make significant clinical decisions for patient care.** More research is required to analyze the potential diagnostic of Covid-19 in saliva to develop

rapid chair side tests for the detection of Covid-19 and it is also pivotal to improve and develop successful strategies for prevention, especially for dentists and healthcare professionals who are involved in performing aerosol-generating procedures.

Developments in diagnostics

Clarifying the role of lung ultrasonography in COVID-19 respiratory disease.

Pierce CW.
Canadian Medical Association Journal
2020, Apr 20, PMID: 32312828
Level of Evidence: 5 - Literature Cited
Type of Article: Commentary

Summary: This commentary was prompted in response to another published article claiming that ultrasound could be useful in the workup of patients with suspected COVID-19. Although this original article mentioned that this could not be differentiated from viral pneumonia, this author aimed to clarify that sonographic findings are highly nonspecific and that findings must be further qualified by other diagnostics.

Developments in Treatments

PAK1-blockers: Potential Therapeutics Against COVID-19.

Maruta H, He H
Med Drug Discov.
2020 Apr 19; PMID: 32313880
Level of Evidence: 3- Literature review
Type of Article: Review

BLUF: Here the authors review the use of p21-activated kinase (PAK) inhibitors as potential therapeutics for COVID-19.

Abstract:
PAK1 (RAC/CDC42-activated kinase 1) is the major "pathogenic" kinase whose abnormal activation causes a wide variety of diseases/disorders including cancers, inflammation, malaria and pandemic viral infection including influenza, HIV and COVID-19. Since Louis Pateur who developed a vaccine against rabies in 1885, in general a series of "specific" vaccines have been used for treatment of viral infection, mainly because antibiotics in general are ineffective for treatment of viral infection. However, it takes 12-18 months till the effective vaccine becomes available. Until then ventilator (O2 supplier) would be the most common tool for saving the life of COVID-19 patients. Thus, as alternative potentially more direct "broad-spectrum" COVID-19 therapeutics, several natural and synthetic PAK1-blockers such as propolis, melatonin, ciclesonide, hydroxy chloroquine (HQ), ivermection *(sic)*, and ketorolac, which are readily available in the market, are introduced here.

Identification of Potential Binders of the Main Protease 3CL^{pro} of the COVID-19 via Structure-Based Ligand Design and Molecular Modeling

Macchiagodena M, Pagliai M, Procacci P.
Chem Phys Lett
2020 Apr 18; PMID: 32313296
Level of Evidence: 5 - Statistical Modeling

Type of Article: Research

BLUF: The SARS-CoV-2 protease $3CL^{pro}$ is essential for the proper formation of viral proteins and is therefore a promising target of therapeutics. Here the authors use *in silico* modeling and comparisons with the known structures of the SARS-CoV related protease to identify drug candidates for COVID-19 treatment designed to inhibit $3CL^{pro}$.

Abstract: We have applied a computational strategy, using a combination of virtual screening, docking and molecular dynamics techniques, aimed at identifying possible lead compounds for the non-covalent inhibition of the main protease 3CLpro of the SARS-CoV2 Coronavirus. Based on the X-ray structure (PDB code: 6LU7), ligands were generated using a multimodal structure-based design and then docked to the monomer in the active state. Docking calculations show that ligand-binding is strikingly similar in SARS-CoV and SARS-CoV2 main proteases. The most potent docked ligands are found to share a common binding pattern with aromatic moieties connected by rotatable bonds in a pseudo-linear arrangement.

Doxycycline, a Widely Used Antibiotic in Dermatology With a Possible Anti-Inflammatory Action Against IL-6 in COVID-19 Outbreak

Conforti C, Giuffrida R, Zalaudek I, Di Meo N
Dermatol Ther
2020 Apr 20; PMID: 32314492
Level of Evidence: 5 – Expert Opinion
Type of Article: Letter

Summary: This article **suggests testing of doxycycline in combination with hydroxychloroquine** as a treatment for COVID-19, citing its **antagonist role** in low doses **to proinflammatory cytokines**. The authors briefly mention the mixed results of hydroxychloroquine/azithromycin combo therapy in emergent COVID-19 literature.

A short review on antibody therapy for COVID-19.

Kumar GV, Jeyanthi V, Ramakrishnan S.Kumar GV, et al.
New Microbes New Infect
2020 Apr 20; PMID: 32313660
Level of Evidence: 5 - Expert opinion
Type of Article: Review

BLUF: In addition the anti-malaria drug hydroxychloroquine and supportive oxygenation, antibody therapies have been proposed as a possible strategy to contain SARS-CoV-2 (COVID-19): monoclonal antibody therapy and convalescent plasma therapy. **Isolating neutralizing antibodies in those cured of COVID-19 will be a critical step in developing emergency prophylaxis and treatments on a large-scale.**

Abstract:
The beginning of the novel SARS-CoV-2 human coronavirus in Wuhan, China, has triggered a worldwide respiratory disease outbreak (COVID-19). By April 07, 2020, SARSCoV-2 has affected more than 1.36 million people worldwide and caused more than 75,900 deaths. To date, the anti-malaria drug hydroxychloroquine found to be a treatment option for SARS-CoV-2. In addition to supportive treatment, such as oxygen supply in moderate cases and extracorporeal membrane oxygenation in critically ill patients, unique medications for this condition are also under investigation. Here we reviewed the antibody therapy might be an immediate strategy for emergency prophylaxis and SARS-CoV-2 therapy.

COVID-19 convalescent plasma transfusion.

Langhi, Dante M; Santis, Gil C; Bordin, Jose O
Hematol Transfus Cell Ther
2020 Apr 17; PMID: 32313872
Level of Evidence: 5 - Expert Opinion
Type of Article: Comment

Summary: The main cause of death in COVID-19 patients is severe acute respiratory syndrome (SARS). The administration of convalescent plasma or immunoglobulins has been shown to reduce the hospital stay and mortality rates in patients with SARS, as demonstrated by a series of studies and meta-analyses described here. Initial investigation of the use of plasma collected from recovered patients in COVID-19 shows promise, although there is a need for rigorous clinical trials to further explore this as a treatment.

Drug repurposing for coronavirus (COVID-19): in silico screening of known drugs against coronavirus 3CL hydrolase and protease enzymes

Elmezayen, Ammar D; Al-Obaidi, Anas; Sahin, Alp Tegin; Yelekci, Kemal
Journal of Biomolecular Structure and Dynamics
2020 Apr 20; PMID: 32306862
Level of Evidence: 5 - Mechanism Based Reasoning
Type of Article: Research

BLUF: Previous studies have shown the Mpro and TMPRSS2 enzymes to be highly potent targets for anti-COVID-19 inhibitors. In this study, the repurposing of four commercially available drugs (Talampicillin, Lurasidone, Rubitecan, and Loprazolam) for inhibition of these two enzymes was investigated through the use of structure-based virtual screening. Additional potential inhibitors of Mpro and TMPRSS2 were also identified.

Abstract

In December 2019, COVID-19 epidemic was described in Wuhan, China, and the infection has spread widely affecting hundreds of thousands. Herein, an effort was made to identify commercially available drugs in order to repurpose them against coronavirus by the means of structure-based virtual screening. In addition, ZINC15 library was used to identify novel leads against main proteases. Human TMPRSS2 3D structure was first generated using homology modeling approach. Our molecular docking study showed **four potential inhibitors against Mpro enzyme, two available drugs (Talampicillin and Lurasidone) and two novel drug-like compounds (ZINC000000702323 and ZINC000012481889).** Moreover, four promising inhibitors were identified against TMPRSS2; Rubitecan and Loprazolam drugs, and compounds ZINC000015988935 and ZINC000103558522. ADMET profile showed that the hits from our study are safe and drug-like compounds. Furthermore, molecular dynamic (MD) simulation and binding free energy calculation using the MM-PBSA method was performed to calculate the interaction energy of the top-ranked drugs.

Nafamostat mesylate blocks activation of SARS-CoV-2: New treatment option for COVID-19.

Hoffmann M, Schroeder S, Kleine-Weber H, Müller MA, Drosten C, Pöhlmann S.Hoffmann M, et al.
Antimicrob Agents Chemother.
2020 Apr 20; PMID: 32312781
Level of Evidence: 5 - Experimental research
Type of Article: Research

Summary: This research article looks at TMPRSS2 (a cellular enzyme transmembrane protease serine 2), which cleaves and activates S protein in SARS-CoV-2 as a possible target for drug therapy. 3 serine protease inhibitors against TMPRSS2 are compared: camostat mesylate (NI-03), gabexate mesylate (FOY), and nafamostate mesylate (Futhan) for inhibition of SARS-Cov-2 infection in lung-derived human cells. The negative control is a machupo virus or vesicular stomatitis virus. The authors conclude that nafamostate mesylate has a higher efficiency than camostate mesylate; neither activates against the vesicular stomatitis virus, and should be evaluated for clinical trials as a COVID-19 treatment.

Cytokine storm and immunomodulatory therapy in COVID-19: role of chloroquine and anti-IL-6 monoclonal antibodies

Zhao, Ming
International Journal of Antimicrobial Agents
2020 Apr 16; PMID: 32305588
Level of Evidence: 5 - Mechanism Based Reasoning
Type of Article: Comment

BLUF: Immunomodulatory agents, including chloroquine, hydroxychloroquine, and tocilizumab, that can be used to down-regulate the cytokine storm in COVID-19 are discussed. Durations and dosages are included in the table below.

Abstract: Discussion of the **role of immunomodulatory agents to reduce the cytokine storm in severe cases of COVID-19**. Potential immunomodulatory agents currently used in the treatment of COVID-19 (**chloroquine, hydroxychloroquine and tocilizumab**) are discussed. Other immunomodulatory agents with good safety profiles may be considered for use in combination with antiviral drugs for the treatment of severe or critical cases of COVID-19.

Table 1

Dosing regimen of chloroquine, hydroxychloroquine and tocilizumab for treatment of COVID-19

Drug	Dosage	Duration
Chloroquine phosphate[a]	Only for adults aged 18–65 years Body weight >50 kg: 500 mg, twice per day Body weight ≤50 kg: 500 mg, twice per day, for Days 1–2 followed by 500 mg once per day for Days 3–7	7 days
	Contraindications	Cardiac diseases or conditions
	Precautions	Pay close attention to drug–drug interactions and adverse reactions during the use of chloroquine
Hydroxychloroquine sulphate[b]	200 mg, three times per day	10 days
	Contraindications	Retinopathy, G6PD deficiency, QT prolongation
Tocilizumab	First dose: 4–8 mg/kg (400 mg recommended) diluted with 0.9% sodium chloride injection into 100 mL Intravenous infusion time: ≥1 h Second dose: if the first dose is not effective, a second dose can be given after 12 h (same dose as before) Total number of administrations: ≤2 Maximum single dose: ≤800 mg	
	Precautions	Pay attention to anaphylaxis
	Contraindications	Active infections such as tuberculosis

G6PD, glucose-6-phosphate dehydrogenase.

[a]This dosing regimen of chloroquine is provided in the Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia (Trial Version 7) issued by the National Health Commission of China.

[b]This dosing regimen of hydroxychloroquine was used in an open-label non-randomized clinical trial conducted in France to investigate the efficacy of hydroxychloroquine and azithromycin therapy in the treatment of COVID-19. Breastfeeding and pregnant patients and children were excluded from this clinical trial.

Ivermectin and Novel Coronavirus Disease (COVID-19): Keeping Rigor in Times of Urgency.

Chaccour C, Hammann F, Ramón-García S, Rabinovich NR.
Am J Trop Med Hyg
2020 Apr 16; PMID: 32314704
Level of Evidence: 5 – Expert Opinion
Type of Article: Editorial

BLUF: While there are concerns that ivermectin may only have appreciable activity against COVID-19 at unsafe doses, it is still appropriate to conduct further research on this drug's potential use as a COVID-19 treatment.

Summary: A recent study reported that ivermectin inhibits *in vitro* replication of COVID-19 at concentrations that correlate with therapeutic doses beyond what prior studies have suggested are safe and well tolerated. The authors of this paper argue that clinical trials assessing ivermectin as a treatment are still worthwhile to perform, provided that "extreme due diligence and regulatory review" are performed prior to testing ivermectin therapy in severe COVID-19 cases. Safety concerns include 1) the weakened efficacy of the blood brain barrier during a hyperinflammatory state and 2) potentially increased risk of toxicity with concomitant use of antiretrovirals that are known to inhibit of cytochrome P_{450} 3A4 and/or P-glycoprotein efflux pumps. In light of these concerns, researchers should consider enrolling lower risk COVID-19 cases in initial clinical trials of ivermectin. Off-label, compassionate use of ivermectin requires cautious weighing of potential harms and benefits.

Mental Health & Resilience Needs

COVID-19's impact on healthcare workforce

Redistributing of Working Schedules by the Infective Principle - Will The COVID-19 Pandemic Finally Make Us Remember the Names of People We Shake Hands With?

Marko Ć, Košec A, Petrana B.Marko Ć, et al.
Infect Control Hosp Epidemiol.
2020 Apr 21; PMID: 32312359
Level of Evidence: 5 - Expert Opinion
Type of Article: Letter to Editor

Summary: This article expands on potential ways to mitigate psychological stress on health professionals and reduce the burden of possible inter-hospitals transmission among patients by suggesting vigorous screening among healthcare professionals and mainly, revamping work schedules that may be concurrent to self-isolation should the health workers be in contact with positive COVID-19 patients.

Time to 'Buddy Up' - Simple Strategies to Support Oncologists During the Covid-19 Pandemic.

Barry A, Murphy T, Prince R, May T, Zimmermann C, Elliott M.
Adv Radiat Oncol.
2020 Apr 20; PMID: 32313847
Level of Evidence: 5 - Expert Opinion
Type of Article: Comment

Summary: In order to combat the burnout that oncologists face during the period of social distancing, one group of oncologists created the multi-step approach called the "buddy up" system. It consists of highlighting self and community efficacy, maintaining contact via virtual coffee shop meetings, and encouraging relaxation via meditation, yoga, and pilates.

Reflections on Resilience during the Novel Coronavirus Disease (COVID-19) Pandemic: Six Lessons from Working in Resource-Denied Settings.

Ratner L, Martin-Blais R, Warrell C, Narla NP.Ratner L, et al.
Am J Trop Med Hyg.
2020 Apr 17; .PMID: 32314700
Level of Evidence: 5 - Expert Opinion
Type of Article: Commentary

BLUF: COVID-19 has greatly altered what it means to provide quality care in the Global North, which has typically been resource-rich. Shortages in PPE and ventilators have put front-line health care workers under great duress, and this article contains reflections on resilience during this epidemic.

Abstract:
The 2019 novel coronavirus disease (COVID-19) pandemic highlights the experience of communities in the global South that have grappled with vulnerability and scarcity for decades. In the global North, many frontline workers are now being similarly forced to provide and ration care in unprecedented ways, with minimal guidance. We outline six reflections gained as Western practitioners working in

resource-denied settings which inform our current experience with COVID-19. The reflections include the following: managing trauma, remaining flexible in dynamic situations, and embracing discomfort to think bigger about context-specific solutions to collectively build back our systems. Through this contextualized reflection on resilience, we hope to motivate strength and solidarity for providers, patients, and health systems, while proposing critical questions for our response moving forward.

Annals for Hospitalists Inpatient Notes - Preparing for Battle: How Hospitalists Can Manage the Stress of COVID-19.

Morganstein JC.Morganstein JC.
Ann Intern Med.
2020 Apr 21; PMID: 32315380
Level of Evidence: 5 - Expert opinion
Type of Article: Commentary
Summary: "**Ensuring the well-being of hospitalists at the leading edge of our health care response requires action** by organizational leaders and healthcare personnel alike." The author's recommendations include fostering a **growth mindset, taking breaks, staying connected, finding reliable sources of information, communicating effectively,** providing **adequate supplies and training**, and **acknowledging and addressing the difficult emotions** that arise in providing care during a pandemic.

COVID-19 Community Stabilization and Sustainability Framework: An Integration of the Maslow Hierarchy of Needs and Social Determinants of Health.

Ryan BJ, Coppola D, Canyon DV, Brickhouse M, Swienton R.
Disaster Med Public Health Prep
2020 Apr 21; PMID: 32314954
Level of Evidence: 5 - Expert opinion
Type of Article: Opinion
Summary: Leaders and disaster risk management stakeholders must understand and incorporate human and societal needs in accordance with Maslow's hierarchy of needs to guide decisions regarding COVID-19 response and recovery strategies. Decision-makers should implement a community stabilization and sustainability framework that incorporates baseline requirements regarding testing and protective measures, regulations and recommendations based on the vulnerability of the population, and quantitative data-based triggers or thresholds of peak or declining infection rates to guide response actions.

Emotional Challenges in Overall Public Health

Family violence and COVID-19: Increased vulnerability and reduced options for support.

Usher K, Bhullar N, Durkin J, Gyamfi N, Jackson D.
Int J Ment Health Nurs.
2020 Apr 20; PMID: 32314526
Level of Evidence: 5 - Expert Opinion
Type of Article: Comment
BLUF: "Governments and policy makers **must create awareness about an increased risk of violence during pandemics**, **highlight the need for people to keep in touch with each**

other (while observing precautionary measures) and the **great importance of reporting any concerns of abuse.**"

Abstract: Due to the social isolation measures implemented across the globe to help reduce the spread of COVID-19, people living in volatile situations of family violence are restricted to their homes. Social isolation exacerbates personal and collective vulnerabilities while limiting accessible and familiar support options. In many countries, including Australia, we have already seen an increase in demand for domestic violence services and reports of increased risk for children not attending schools; a pattern similar to previous episodes of social isolation associated with epidemics and pandemics.

Silver Linings

Covid-19 is an opportunity for gender equality within the workplace and at home.

Wenham C, Smith J, Morgan R.
BMJ
2020 Apr 20; PMID: 32312767
Level of Evidence: 6 – No Data Cited
Type of Article: Editorial

Summarizing Excerpt: "[COVID-19] could have two effects: firstly, recognition that women disproportionately take on [the] burden [of childcare], and considerations for how to formally recognise this within economies; and, secondly, the recognition that men no longer have housewives at home to perform this load, and that shared parental and domestic duty is much more likely, with employers considering more flexible working patterns."

Acknowledgements

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