

COVID-19 Resource Desk

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New Research

*note, **PREPRINTS** have not undergone formal peer review

COVID-19 related publications by Providence caregivers – see [Digital Commons](#)

Basic Science / Virology / Pre-clinical

- 1. Structural basis for neutralization of SARS-CoV-2 and SARS-CoV by a potent therapeutic antibody.** Lv Z, Deng YQ, Ye Q, et al. *Science*. 2020 Jul 23:eabc5881. doi: 10.1126/science.abc5881.
<https://science.sciencemag.org/content/early/2020/07/22/science.abc5881>
Findings: Here we report a humanized monoclonal antibody, H014, efficiently neutralizes SARS-CoV-2 and SARS-CoV pseudoviruses as well as authentic SARS-CoV-2 at *nM* level by engaging the S receptor binding domain (RBD). Importantly, H014 administration reduced SARS-CoV-2 titers in the infected lungs and prevented pulmonary pathology in hACE2 mouse model. Cryo-EM characterization of the SARS-CoV-2 S trimer in complex with the H014 Fab fragment unveiled a novel conformational epitope, which is only accessible when the RBD is in open conformation. Biochemical, cellular, virological and structural studies demonstrated that H014 prevents attachment of SARS-CoV-2 to its host cell receptors. Epitope analysis of available neutralizing antibodies against SARS-CoV and SARS-CoV-2 uncover broad cross-protective epitopes. Our results highlight a key role for antibody-based therapeutic interventions in the treatment of COVID-19.
- 2. Characteristics and Strength of Evidence of COVID-19 Studies Registered on ClinicalTrials.gov.** Pundi K, Perino AC, Harrington RA, et al. *JAMA Intern Med*. Published online July 27, 2020. doi:10.1001/jamainternmed.2020.2904
<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2768882>
Findings: We identified 1551 studies registered from March 1, 2011, to May 19, 2020, meeting inclusion criteria: 911 (58.7%) interventional (including 664 randomized clinical trials [RCTs]) and 640 (41.3%) observational studies; 1180 (76.1%) were single center. Of the 640 observational studies, 517 (80.8%) were single center and 123 (19.2%) were multicenter, 36 of which had 10 or more centers. Eighty-seven studies (13.6%) were prospective cohort studies that could yield level 2 evidence. Although a few large multicenter trials may generate high-quality evidence, the large proportion of studies with an expected low level of evidence is concerning. Rapid dissemination of studies with low-quality evidence studies can influence public opinion, government actions, and clinical practice in potentially harmful ways,³

especially with a rising tide of COVID-19 study dissemination via preprint or other strategies ahead of peer review.

Clinical Syndrome

3. **Presence of Genetic Variants among Young Men with Severe COVID-19.** van der Made CI, Simons A, Schuurs-Hoeijmakers J, et al. *JAMA*. Published online July 24, 2020. doi:10.1001/jama.2020.13719
<https://jamanetwork.com/journals/jama/fullarticle/2768926?resultClick=1>
Findings: Severe coronavirus disease 2019 (COVID-19) can occur in younger, predominantly male, patients without preexisting medical conditions. Some individuals may have primary immunodeficiencies that predispose to severe infections caused by SARS-CoV-2. In this case series of 4 young male patients with severe COVID-19, rare putative loss-of-function variants of X-chromosomal TLR7 were identified that were associated with impaired type I and II IFN responses. These preliminary findings provide insights into the pathogenesis of COVID-19.
4. **Thyrotoxicosis in Patients with COVID-19: The THYRCOV Study**_ Lania A, Sandri MT, Cellini M, et al. *Eur J Endocrinol*. 2020 Jul 1;EJE-20-0335.R2. doi: 10.1530/EJE-20-0335.
<https://ejebioscientifica.com/view/journals/eje/aop/eje-20-0335/eje-20-0335.xml>
Findings: This study assessed thyroid function in patients affected by the coronavirus disease-19 (COVID-19), based on the hypothesis that the cytokine storm associated with COVID-19 may influence thyroid function and/or the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) may directly act on thyroid cells, such as previously demonstrated for SARS-CoV-1 infection. We provide first evidence that COVID-19 may be associated with high risk of thyrotoxicosis in relationship with systemic immune activation induced by the SARS-CoV-2 infection.
5. **COVID-19 and Coagulation Dysfunction in Adults: A Systematic Review and Meta-analysis.** Lin J, Yan H, Chen H, et al. *J Med Virol*. 2020 Jul 24. doi: 10.1002/jmv.26346
<https://onlinelibrary.wiley.com/doi/10.1002/jmv.26346>
Findings: A total of 13 studies with 1,341 adult patients were enrolled in this analysis. Platelet, d-dimer and fibrinogen were significantly associated with the severity in COVID-19 patients. The meta-analysis revealed that no correlation was evident between an increased severity risk of COVID-19 and activated partial thromboplastin time (APTT) or prothrombin time (PT). The single arm meta-analysis showed that, compared with the non-severe group, the severe group had a lower pooled platelet [165.12 (95% CI: 157.38-172.85) vs. 190.09 (95% CI: 179.45-200.74)], higher d-dimer [0.49 (95% CI: 0.33-0.64) vs. 0.27 (95% CI: 0.20-0.34)] and higher fibrinogen [4.34 (95% CI: 1.98-6.70) vs. 3.19 (95% CI: 1.13-5.24)]. Coagulation dysfunction is closely related to the severity of COVID-19 patients, in which low platelet, high d-dimer and fibrinogen upon admission may serve as risk indicators for increased aggression of the disease.
6. **Cytokine profile in plasma of severe COVID-19 does not differ from ARDS and sepsis.** Wilson JG, Simpson LJ, Ferreira AM, et al. *JCI Insight*. 2020 Jul 24:140289. doi: 10.1172/jci.insight.140289. <https://insight.jci.org/articles/view/140289/pdf>

Findings: Elevated levels of inflammatory cytokines have been associated with poor outcomes among COVID-19 patients. It is unknown, however, how these levels compare to those observed in critically ill patients with ARDS or sepsis due to other causes. 15 hospitalized COVID-19 patients, 9 of whom were critically ill, were compared to critically ill patients with ARDS (n = 12) or sepsis (n = 16). Levels of inflammatory cytokines were not higher in severe COVID-19 patients than in moderate COVID-19 or critically ill patients with ARDS or sepsis in this small cohort. Broad use of immunosuppressive therapies in ARDS has failed in numerous Phase 3 studies; use of these therapies in unselected patients with COVID-19 may be unwarranted.

- 7. COVID-19-Related Cardiovascular Disease and Practical Considerations for Perioperative Clinicians.** Gerstein NS, Venkataramani R, Goumas AM, et al. *Semin Cardiothorac Vasc Anesth.* 2020 Jul 24;1089253220943019. doi: 10.1177/1089253220943019.

<https://journals.sagepub.com/doi/pdf/10.1177/1089253220943019>

Findings: Nearly one third of infected patients, especially those with preexisting cardiovascular disease, are reported to present with some combination of acute cardiac injury, myocarditis, heart failure, cardiogenic shock, or significant dysrhythmias. In addition, COVID-19 infections are also associated with high rates of thromboembolic and disseminated intravascular coagulation complications. Severe myocarditis and heart failure have both been reported as the initial presenting conditions in COVID-19 infection. This review highlights the important considerations related to the CV manifestations of COVID-19 infections, describes the mechanisms and clinical presentation of CV injury, and provides practical management and therapy suggestions. This narrative review is based primarily on the multiple case series and cohorts from the largest initial COVID-19 outbreak centers.

- 8. Outcomes of Cardiovascular Magnetic Resonance Imaging in Patients Recently Recovered from Coronavirus Disease 2019 (COVID-19).** Puntmann Vo, Carerj ML, Wieters I, et al *JAMA Cardiol.* July 27, 2020. doi:10.1001/jamacardio.2020.3557

<https://jamanetwork.com/journals/jamacardiology/fullarticle/2768916>

Findings: In this cohort study including 100 patients recently recovered from COVID-19 identified from a COVID-19 test center, cardiac magnetic resonance imaging revealed cardiac involvement in 78 patients (78%) and ongoing myocardial inflammation in 60 patients (60%), which was independent of preexisting conditions, severity and overall course of the acute illness, and the time from the original diagnosis.

- 9. Bacterial co-infection and secondary infection in patients with COVID-19: a living rapid review and meta-analysis.** Langford BJ, So M, Raybardhan S, et al. *Clin Microbiol Infect.* 2020 Jul 22;S1198-743X(20)30423-7. doi: 10.1016/j.cmi.2020.07.016.

<https://www.sciencedirect.com/science/article/pii/S1198743X20304237?via%3Dihub>

Findings: Of 1308 studies screened, 28 were eligible and included in the rapid review representing 3448 patients with COVID-19 evaluated for acute bacterial infection. In the meta-analysis, bacterial co-infection was identified in 3.5% of patients and secondary bacterial infection in 15.5% of patients. The overall proportion of COVID-19 patients with bacterial infection was 7.1%. Bacterial infection was more common in critically ill patients 8.1%. The

majority of patients with COVID-19 received antibiotics. Bacterial co-infection is relatively infrequent in hospitalized patients with COVID-19, these patients may not require empiric antibacterial treatment.

- 10. Longitudinal analyses reveal immunological misfiring in severe COVID-19.** Lucas C, Wong P, Klein J, et al. *Nature*. 2020 Jul 27. doi: 10.1038/s41586-020-2588-y.
<https://www.nature.com/articles/s41586-020-2588-y>
Findings: We serially analysed immune responses in 113 COVID-19 patients with moderate (non-ICU) and severe (ICU) disease. Immune profiling revealed an overall increase in innate cell lineages with a concomitant reduction in T cell number. We identify an association between early, elevated cytokines and worse disease outcomes. Following an early increase in cytokines, COVID-19 patients with moderate disease displayed a progressive reduction in type-1 (antiviral) and type-3 (antifungal) responses. In contrast, patients with severe disease maintained these elevated responses throughout the course of disease. The immune profile of patients who recovered with moderate disease was enriched in tissue reparative growth factor signature, while the profile for those with worsened disease trajectory had elevated levels of all four signatures. Thus, we identified development of a maladapted immune response profile associated with severe COVID-19 outcome and early immune signatures that correlate with divergent disease trajectories.

Diagnosics & Screening

- 11. Rapid Scaling Up of Covid-19 Diagnostic Testing in the United States — The NIH RADx Initiative.** Tromberg BJ, Schwetz TA, Pérez-Stable EJ, et al. *NEJM*. July 22, 2020. DOI: 10.1056/NEJMsr2022263 <https://www.nejm.org/doi/full/10.1056/NEJMsr2022263?query=TOC>
Findings: Expanding the capacity, throughput, speed of returning results, analytic performance, and regional placement of diagnostic technologies is urgently needed and, if successful, will contribute importantly to the current national efforts to curb the Covid-19 pandemic and help to reduce inequities for underserved populations. As we embark on this initiative, the challenges ahead are considerable, and the timetable is truly daunting. Aiming to achieve this rapid evaluation, validation, and scale-up has rarely, if ever, been attempted at this pace. However, the NIH is in a position to serve as a “venture investment” organization and is currently striving to operate in that entrepreneurial spirit. The success of the RADx program will depend on truly innovative ideas coming forward from the minds and laboratories of technology developers, a robust and rapidly responsive expert evaluation system, extensive collaborations in validation and scale-up with experts from all sectors, and strong community partnerships to support testing availability and uptake. All these partners are profoundly energized by a sense of urgency, opportunity, and responsibility to provide testing at scale in the face of this global pandemic.
- 12. Systematic testing for influenza and COVID-19 among patients with respiratory illness.** Flannery B, Meece JK, Williams JV, et al. *Clin Infect Dis*. 2020 Jul 20;ciaa1023. doi: 10.1093/cid/ciaa1023.
<https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa1023/5873821>

Findings: During the influenza season, respiratory specimens including nasal, throat or nasopharyngeal swabs were prospectively tested for influenza by RT-PCR. We retrospectively tested a subset of stored specimens or extracted RNA at study sites for SARS-CoV-2 using RT-PCR designed to detect the SARS-CoV-2 nucleocapsid gene. Of 4961 specimens tested retrospectively, five (0.1%) specimens from patients at three study sites tested positive for SARS-CoV-2, all from patients enrolled within one week of the first COVID-19 cases reported in surveillance counties. None of the patients had been previously identified as having COVID-19. Given overlap between ARI/ILI and symptoms of mild/moderate COVID-19, systematic testing for SARS-CoV-2 and influenza will be needed during the upcoming influenza season to interpret trends in ILI surveillance and determine contributions of each viral illness to the burden of respiratory disease. Testing for both pathogens (and other respiratory viruses) may become routine for inpatients with respiratory illness but will depend upon availability and access to testing among patients with mild illness.

13. **SARS-CoV-2 screening of asymptomatic healthcare workers.** Jameson A, Biersack M, Sebastian T. *Infect Control Hosp Epidemiol.* 2020 Jul 23;1-8. doi: 10.1017/ice.2020.361. <https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/sarscov2-screening-of-asymptomatic-healthcare-workers/558E2FE88203154D10603E7408EB772B>

Findings: Free, voluntary SARS-CoV-2 testing was made available to asymptomatic hospital staff caring for COVID-19 positive patients over a 2-week period at a 283-bed teaching hospital in Michigan. Volunteer participants were tested utilizing the Cepheid GeneXpert RT-PCR platform via nasopharyngeal swabs and results were made available within four hours of testing. Of 499 eligible participants, 121 personnel volunteered to undergo testing. All 121 tests were negative for SARS-CoV-2. Rigorous infection control practices, including universal patient testing, symptom screening of hospital workers, and cohorting of COVID-19 patients, are an effective method of preventing SARS-CoV-2 acquisition in healthcare workers routinely caring for COVID-19 positive patients. Successful implementation of these strategies may represent an effective alternative to routine and repeated testing of asymptomatic healthcare workers.

14. **Scent dog identification of samples from COVID-19 patients - a pilot study.** Jendry P, Schulz C, Twele F, et al. *BMC Infect Dis.* 2020 Jul 23;20(1):536. doi: 10.1186/s12879-020-05281-3. <https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-020-05281-3>

Findings: Eight detection dogs were trained for 1 week to detect saliva or tracheobronchial secretions of SARS-CoV-2 infected patients in a randomised, double-blinded and controlled study. The dogs were able to discriminate between samples of infected (positive) and non-infected (negative) individuals with average diagnostic sensitivity of 82.63% (95% confidence interval [CI]: 82.02-83.24%) and specificity of 96.35% (95% CI: 96.31-96.39%). During the presentation of 1012 randomised samples, the dogs achieved an overall average detection rate of 94% ($\pm 3.4\%$) with 157 correct indications of positive, 792 correct rejections of negative, 33 incorrect indications of negative or incorrect rejections of 30 positive sample presentations. These preliminary findings indicate that trained detection dogs can identify respiratory secretion samples from hospitalised and clinically diseased SARS-CoV-2 infected individuals by discriminating between samples from SARS-CoV-2 infected patients and negative controls.

- 15. Reliability of self-sampling for accurate assessment of respiratory virus viral and immunologic kinetics.** Waghmare A, Krantz EM, Baral S, et al. *J Infect Dis.* 2020 Jul 25;jiaa451. doi: 10.1093/infdis/jiaa451.
<https://academic.oup.com/jid/article/doi/10.1093/infdis/jiaa451/5876407>
Findings: We demonstrated that self-sampling with foam swabs is well-tolerated and provides quantitative viral output concordant with flocculated swabs. Using longitudinal home-based self-sampling, we demonstrate nasal cytokine levels correlate and cluster according to immune cell of origin. Periods of stable viral loads are followed by rapid elimination, which could be coupled with cytokine expansion and contraction. Nasal foam swab self-sampling at home provides a precise, mechanistic readout of respiratory virus shedding and local immune responses.
- 16. Point-of-care serological assays for delayed SARS-CoV-2 case identification among health-care workers in the UK: a prospective multicentre cohort study.** Pallett SJC, Rayment M, Patel A, et al. *Lancet Respir Med.* 2020 Jul 24;S2213-2600(20)30315-5. doi: 10.1016/S2213-2600(20)30315-5. <https://www.sciencedirect.com/science/article/pii/S2213260020303155?via%3Dihub>
Findings: We aimed to investigate the performance of point-of-care and laboratory serology assays and their utility in late case identification, and to estimate SARS-CoV-2 seroprevalence. There was variation in test performance between the lateral flow serological assays; however, the Encode assay displayed reasonable IgG sensitivity (127 of 136; 93.4%) and specificity (99 of 100; 99.0%) among PCR-proven cases and good agreement (282 of 300; 94.0%) with the laboratory immunoassay. By contrast, the Onsite assay had reduced sensitivity (120 of 136; 88.2%) and specificity (94 of 100; 94.0%) and agreement (254 of 300; 84.7%). Seroprevalence across the entire workforce was estimated at 18.0%.
- 17. Early Recognition of Coronavirus 2019 Disease (COVID-19) Infection in Surgical Inpatients: The Importance of a Risk-Stratified Approach for Early Testing and Isolation.** Wee LE, Sim XYJ, Conceicao EP, et al. *Surg Infect (Larchmt).* 2020 Jul 22. doi: 10.1089/sur.2020.184.
<https://www.liebertpub.com/doi/10.1089/sur.2020.184>
Findings: From January through April 2020, a total of 8,437 patients were admitted to our surgical department; 5.9% (498/8437) required peri-operative testing for SARS-CoV-2. Because testing was in-house with turnaround within 24 hours, only a small number of emergency operations (n = 10) were conducted for suspected COVID-19 cases prior to results; none tested positive. The testing yield was lower in surgical inpatients compared with medical inpatients. Three operations were conducted in known COVID-19 cases; all healthcare workers used full PPE. A risk-stratified testing strategy picked up previously unsuspected COVID-19 in six cases; 66.7% (4/6) were asymptomatic at presentation. Although 48 HCWs were exposed to these six cases, delayed diagnosis was averted and no evidence of spread to patients or HCWs was detected. A risk-stratified approach allowed for early recognition, testing, and isolation of potential COVID-19 infection in surgical patients, ensuring continuity of surgical services.

18. **SARS-CoV-2 genomic variations associated with mortality rate of COVID-19.** Toyoshima Y, Nemoto K, Matsumoto S, et al. *J Hum Genet.* 2020 Jul 22. doi: 10.1038/s10038-020-0808-9. <https://www.nature.com/articles/s10038-020-0808-9>
Findings: We comprehensively investigated 12,343 SARS-CoV-2 genome sequences isolated from patients/individuals in six geographic areas and identified a total of 1234 mutations by comparing with the reference SARS-CoV-2 sequence. Through a hierarchical clustering based on the mutant frequencies, we classified the 28 countries into three clusters showing different fatality rates of COVID-19. We found that BCG-vaccination status significantly associated with the fatality rates as well as number of infected cases. In BCG-vaccinated countries, the frequency of the S 614G variant had a trend of association with the higher fatality rate. We also found that the frequency of several HLA alleles, including HLA-A*11:01, were significantly associated with the fatality rates, although these factors were associated with number of infected cases and not an independent factor to affect fatality rate in each country. Our findings suggest that SARS-CoV-2 mutations as well as BCG-vaccination status and a host genetic factor, HLA genotypes might affect the susceptibility to SARS-CoV-2 infection or severity of COVID-19.

19. **Rapid Decay of Anti-SARS-CoV-2 Antibodies in Persons with Mild Covid-19.** Ibarrondo FJ, Fulcher JA, Goodman-Meza D, et al. *NEJM.* Updated July 23, 2020 DOI: 10.1056/NEJMc2025179 <https://www.nejm.org/doi/full/10.1056/NEJMc2025179>
Findings: We evaluated persons who had recovered from Covid-19, infection had been confirmed by polymerase-chain-reaction assay in 30 of the 34 participants. The other 4 participants had had symptoms compatible with Covid-19 and had cohabitated with persons who were known to have Covid-19 but were not tested because of mild illness and the limited availability of testing. Most of the participants had mild illness; 2 received low-flow supplemental oxygen and Ieronlimab, but they did not receive remdesivir. There were 20 women and 14 men. The mean age was 43 years (range, 21 to 68). Our findings raise concern that humoral immunity against SARS-CoV-2 may not be long lasting in persons with mild illness, who compose the majority of persons with Covid-19. The results call for caution regarding antibody-based “immunity passports,” herd immunity, and perhaps vaccine durability, especially in light of short-lived immunity against common human coronaviruses.

20. **The Contribution of the Age Distribution of Cases to COVID-19 Case Fatality across Countries: A 9-Country Demographic Study.** Sudharsanan N, Didzun O, Barnighausen T, et al. *Ann Intern Med.* 2020 Jul 22. doi: 10.7326/M20-2973. <https://www.acpjournals.org/doi/10.7326/m20-2973>
Findings: The overall observed case fatality rate varies widely, with the highest rates in Italy (9.3%) and the Netherlands (7.4%) and the lowest rates in South Korea (1.6%) and Germany (0.7%). Adjustment for the age distribution of cases explains 66% of the variation of across countries, with a resulting age-standardized median CFR of 1.9%. Selective testing and identifying of older cases considerably warps estimates of the lethality of COVID-19 within populations and comparisons across countries. Removing age distortions and focusing on

differences in age-adjusted case fatality will be essential for accurately comparing countries' performance in caring for patients with COVID-19 and for monitoring the epidemic over time.

21. **Estimated County-Level Prevalence of Selected Underlying Medical Conditions Associated with Increased Risk for Severe COVID-19 Illness — United States, 2018.** Razzaghi H, Wang Y, Lu H, et al. *MMWR Morb Mortal Wkly Rep* 2020;69:945–950. DOI: <http://dx.doi.org/10.15585/mmwr.mm6929a1>

Findings: Older adults and those with chronic obstructive pulmonary disease, heart disease, diabetes, chronic kidney disease, and obesity are at higher risk for severe COVID-19–associated illness. The median model-based estimate of the prevalence of any of five underlying medical conditions associated with increased risk for severe COVID-19–associated illness among U.S. adults was 47.2% among 3,142 U.S. counties. The estimated number of persons with these conditions followed population distributions, but prevalence was higher in more rural counties.

22. **Risk for COVID-19 infection and death among Latinos in the United States: Examining heterogeneity in transmission dynamics.** Rodriguez-Diaz CE, Guilamo-Ramos V, Mena L, et al. *Ann Epidemiol.* 2020 Jul 22;S1047-2797(20)30267-2. doi: 10.1016/j.annepidem.2020.07.007. <https://www.sciencedirect.com/science/article/pii/S1047279720302672?via%3Dihub>

Findings: We compared predictors of COVID-19 cases and deaths between disproportionately Latino counties (>17.8% Latino population) and all other counties through May 11, 2020. COVID-19 diagnoses rates were greater in Latino counties nationally (90.9 vs. 82.0 per 100,000). In multivariable analysis, COVID-19 cases were greater in Northeastern and Midwestern Latino counties. COVID-19 deaths were greater in Midwestern Latino counties. COVID-19 diagnoses were associated with counties with greater monolingual Spanish speakers, employment rates, heart disease deaths, less social distancing, and days since the first reported case. COVID-19 deaths were associated with household occupancy density, air pollution, employment, days since the first reported case, and age (fewer <35yo).

23. **Patients with immune-mediated inflammatory diseases receiving cytokine inhibitors have low prevalence of SARS-CoV-2 seroconversion.** Simon D, Tascilar K, Kronke G, et al. *Nat Commun.* 2020 Jul 24;11(1):3774. doi: 10.1038/s41467-020-17703-6. <https://www.nature.com/articles/s41467-020-17703-6>

Findings: Immune-mediated inflammatory diseases (IMIDs) of the joints, gut and skin are treated with inhibitors of inflammatory cytokines. These cytokines are involved in the pathogenesis of coronavirus disease 2019 (COVID-19). Investigating anti-SARS-CoV-2 antibody responses in IMIDs we observe a reduced incidence of SARS-CoV-2 seroconversion in IMID patients treated with cytokine inhibitors compared to patients receiving no such inhibitors and two healthy control populations, despite similar social exposure. Hence, cytokine inhibitors seem to at least partially protect from SARS-CoV-2 infection.

Healthcare Delivery & Healthcare Workers

24. **Academic Emergency Medicine Physicians' Anxiety Levels, Stressors, and Potential Stress Mitigation Measures during the Acceleration Phase of the COVID-19 Pandemic.** Rodriguez RM,

Medak AJ, Baumann BM, et al. *Acad Emerg Med*. 2020 Jun 22;10.1111/acem.14065. doi: 10.1111/acem.14065. <https://onlinelibrary.wiley.com/doi/abs/10.1111/acem.14065>

Findings: During the acceleration phase, the COVID-19 pandemic has induced substantial workplace and home anxiety in academic EM physicians, and their exposure during work has had a major impact on their home lives. Measures cited to decrease stress include enhanced availability of PPE, rapid turnaround testing at provider discretion, and clear communication about COVID-19 protocol changes.

25. **Ethical Framework for Nutrition Support Resource Allocation During Shortages: Lessons From COVID-19.** Barrocas A, Schwartz DB, Hasse JM, et al. [PSJH author]. *Nutr Clin Pract*. 2020 Aug;35(4):599-605. doi: 10.1002/ncp.10500. Epub 2020 Jun 3. <https://onlinelibrary.wiley.com/doi/abs/10.1002/ncp.10500>

26. **Nursing Activities Score is increased in COVID-19 patients.** Reper P, Bombart MA, Leonard I, et al. *Intensive Crit Care Nurs*. 2020 May 27;102891. doi: 10.1016/j.iccn.2020.102891. <https://www.sciencedirect.com/science/article/pii/S096433972030094X?via%3Dihub>

27. **Prevalence of SARS-CoV-2 Infection Among Asymptomatic Health Care Workers in the Greater Houston, Texas, Area.** Vahidy FS, Bernard DW, Boom ML, et al. *JAMA Netw Open*. 2020 Jul 1;3(7):e2016451. doi: 10.1001/jamanetworkopen.2020.16451.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2768707>

Findings: A total of 2872 individuals, including 2787 HCWs and 85 community residents, were included; the mean (SD) age was 40.9 (11.7) years and 73% (95% CI, 71.6%-74.9%) were women. In all, 3.9% tested positive for SARS-CoV-2. Among clinical HCWs, 5.4% from COVID-19 units and 0.6% from non-COVID units had RT-PCR test results positive for SARS-CoV-2. None of the nonclinical HCWs or community residents had positive test results. Among 1992 HCWs in units caring for patients with COVID-19, the rate of SARS-CoV-2 positivity ranged between 3.6% for support staff to 6.5% for allied health and 6.5% for administrative staff. However, the proportions of participants with positive results for SARS-CoV-2 were not significantly different across the 5 job categories of COVID-19-facing HCWs. We report a 4.8% difference between COVID-19-facing (5.4%) and non-COVID-19-facing (0.6%) HCWs, potentially indicating transmission from patients or coworkers.

Prognosis

28. **Chest CT and Clinical Follow-up of Discharged Patients with COVID-19 in Wenzhou City, Zhejiang, China.** Liu C, Ye L, Xia R, et al. *Ann Am Thorac Soc*. 2020 Jul 21. doi: 10.1513/AnnalsATS.202004-324OC

<https://www.atsjournals.org/doi/abs/10.1513/AnnalsATS.202004-324OC>

Findings: Compared with the last CT scan before discharge, the abnormalities in lungs were gradually absorbed in the first and second follow-ups after discharge. The cases with focal ground-glass opacity reduced from 17.7% to 9.8%. The cases with multiple GGO decreased from 80.4% to 23.5%. The cases with consolidation reduced from 49.0% to 2.0%. The cases with

interlobular septal thickening reduced from 80.4% to 35.3%. The cases with subpleural lines reduced from 29.4% to 7.8%. The cases with irregular lines reduced from 41.2% to 15.7%. The lung lesions of 25.5% patients were fully absorbed in the first CT scans after discharge and the rate of lung recovery increased to 64.7% after the second follow-up. Nucleic acid tests turned recurrently positive in 17.6% discharged patients, in which only 33.3% patients complained clinical symptoms. There were no differences in the characteristics of the last CT before discharge between the patients with recurrently positive test and patients with negative test. The lung damages were fully absorbed in 55.6% discharged patients with recurrence of positive SARS-CoV-2 RNA. The lung damage due to COVID-19 could be reversible for the common COVID-19 patients.

29. Utilization of COVID-19 treatments and clinical outcomes among patients with cancer: A COVID-19 and Cancer Consortium (CCC19) cohort study. Rivera DR, Peters S, Panagiotou OA, et al. *Cancer Discov.* 2020 Jul 22;CD-20-0941. doi: 10.1158/2159-8290.CD-20-0941.

<https://cancerdiscovery.aacrjournals.org/content/early/2020/07/21/2159-8290.CD-20-0941>

Findings: Among 2,186 US adults with invasive cancer and laboratory-confirmed SARS-CoV-2 infection, we examined the association of COVID-19 treatments with 30-day all-cause mortality, and factors associated with treatment. Hydroxychloroquine with any other drug was associated with increased mortality versus treatment with any COVID-19 treatment other than hydroxychloroquine or untreated controls; this association was not present with hydroxychloroquine alone. Remdesivir had numerically reduced mortality versus untreated controls that did not reach statistical significance. Baseline COVID-19 severity was strongly associated with receipt of any treatment. Black patients were approximately half as likely to receive remdesivir as white patients. Our findings add to the emerging understanding of patterns of care for patients with cancer and COVID-19 and support evaluation of emerging treatments through prospective controlled trials inclusive of this population.

30. Outcomes of COVID-19 in Patients with CLL: A Multicenter, International Experience. Mato AR, Roeker LE, Lamanna N, Allan J, Leslie LA, Pagel JM, et al. [PSJH author]. *Blood.* 2020 Jul 20;blood.2020006965. doi: 10.1182/blood.2020006965.

<https://ashpublications.org/blood/article/doi/10.1182/blood.2020006965/461426/Outcomes-of-COVID-19-in-Patients-with-CLL-A>

Findings: CLL patients diagnosed with symptomatic COVID-19 across 43 international centers (n=198) were included. Hospital admission occurred in 90%. Median age at COVID-19 diagnosis was 70.5 years. Median CIRS score was 8 (range 4-32). Thirty-nine percent were treatment-naïve ("watch and wait") while 61% had received ≥ 1 CLL-directed therapy. Ninety patients (45%) were receiving active CLL therapy at COVID-19 diagnosis, most commonly BTK inhibitors. At a median follow-up of 16 days, the overall case fatality rate was 33%, though 25% remain admitted. "Watch and wait" and treated cohorts had similar rates of admission (89% vs. 90%), ICU admission (35% vs. 36%), intubation (33% vs. 25%), and mortality (37% vs. 32%). CLL-directed treatment with BTKi at COVID-19 diagnosis did not impact survival (CFR 34% vs. 35%), though BTKi was held during COVID-19 course for most patients. These data suggest that the subgroup of CLL patients admitted with COVID-19, regardless of disease phase or treatment status, are at high risk of death.

31. **Update Alert 2: Risks and Impact of Angiotensin-Converting Enzyme Inhibitors or Angiotensin-Receptor Blockers on SARS-CoV-2 Infection in Adults.** Mackey K, Kansagara D, Vela K. *Ann Intern Med.* 2020 Jul 23. doi: 10.7326/L20-0969.

<https://www.acpjournals.org/doi/10.7326/L20-0969>

Findings: New Evidence: Results of 3 new meta-analysis evaluating the association of angiotensin-converting enzyme inhibitor (ACEI) or angiotensin-receptor blocker (ARB) use with coronavirus disease 2019 (COVID-19) illness severity are consistent with the findings that we reported in the original manuscript. Five new observational studies also examine this association. Four of these studies found that use of ACEIs or ARBs is not associated with more severe COVID-19 illness. In a retrospective study of 113 patients hospitalized with COVID-19 in Turkey, use of ACEI/ARBs was associated with higher in-hospital mortality. However, a major limitation of the study is that the group of patients taking ACEI/ARBs were older and more likely to have coronary artery disease than the non-ACEI/ARB group. Overall, inclusion of these 3 new meta-analyses and 5 new observational studies does not change the certainty of evidence rating we reported in the original manuscript for key question 2—high-certainty evidence that ACEI or ARB use is not associated with more severe COVID-19 disease.

32. **Liver damage at admission is an independent prognostic factor for COVID-19.** Chen LY, Chu HK, Bai T, et al. *J Dig Dis.* 2020 Jul 26. doi: 10.1111/1751-2980.12925.

<https://onlinelibrary.wiley.com/doi/10.1111/1751-2980.12925>

Findings: Among enrolled 502 patients, 301 patients had abnormal liver function with increased neutrophil count, C-reactive protein, creatinine, troponin (TnI), D-dimer, lactose dehydrogenase (LDH) and creatine kinase (CK). Compared to patients with normal liver functions, those with abnormal liver functions had higher mortality rate (28.9% vs 9.0%, $P < 0.001$), higher ratio of male patients (65.1% vs 40.8%, $P < 0.001$) and higher chance of SIRS development (53.5% vs 41.3%, $P = 0.007$). Among patients with abnormal liver functions, liver damage grade 2 patients (both ALT/AST and ALP/GGT abnormal) had higher ratio of male patients, neutrophil count, PCT, D-dimer and mortality rate. COVID-19 patients with abnormal liver functions have a higher mortality.

33. **The impact of obesity on COVID-19 complications: a retrospective cohort study.** Nakeshbandi M, Maini R, Daniel P, et al. *Int J Obes (Lond).* 2020 Jul 25. doi: 10.1038/s41366-020-0648-x.

<https://www.nature.com/articles/s41366-020-0648-x>

Findings: There were 139 patients (27%) with normal BMI, 150 patients who were overweight (30%), and 215 patients with obesity (43%). After controlling for age, gender, diabetes, hypertension, and qSOFA score, there was a significantly increased risk of mortality in the overweight (RR 1.4, 95% CI 1.1-1.9) and obese groups (RR 1.3, 95% CI 1.0-1.7) compared with those with normal BMI. Similarly, there was a significantly increased relative risk for intubation in the overweight (RR 2.0, 95% CI 1.2-3.3) and obese groups (RR 2.4, 95% CI 1.5-4.0) compared with those with normal BMI. Obesity did not affect rates of AKI, ACl, or ARDS. Furthermore, obesity appears to significantly increase the risk of mortality in males (RR 1.4, 95% CI 1.0-2.0, $P = 0.03$), but not in females (RR 1.2, 95% CI 0.77-1.9, $P = 0.40$). This study reveals that patients

with overweight and obesity who have COVID-19 are at increased risk for mortality and intubation compared to those with normal BMI.

34. **Visceral fat shows the strongest association with the need of intensive Care in Patients with COVID-19.** Watanabe M, Caruso D, Tuccinardi D, et al. *Metabolism*. 2020 Jul 23;154319. doi: 10.1016/j.metabol.2020.154319.
<https://www.sciencedirect.com/science/article/pii/S0026049520301839>
Findings: 150 patients were included (64.7% male, mean age 64 ± 16 years). Visceral fat (VAT) was significantly higher in patients requiring intensive care, together with age, inflammation markers CRP and LDH, and interstitial pneumonia severity as assessed by a Lung Severity Score (LSS). Increasing age, lymphocytes, CRP, LDH, D-Dimer, LSS, total abdominal fat as well as VAT were found to have a significant univariate association with the need of intensive care. A multivariate analysis showed that LSS and VAT were independently associated with the need of intensive care (OR: 1.262; 95%CI: 1.0171-1.488; p = .005 and OR: 2.474; 95%CI: 1.017-6.019; p = .046, respectively). VAT is a marker of worse clinical outcomes in patients with COVID-19. Given the exploratory nature of our study, further investigation is needed to confirm our findings and elucidate the mechanisms underlying such association.
35. **Interleukin-6-based mortality risk model for hospitalised COVID-19 patients.** Rocio LG, Alberto U, Paloma T, et al. *J Allergy Clin Immunol*. 2020 Jul 22;S0091-6749(20)31027-7. doi: 10.1016/j.jaci.2020.07.009.
<https://www.sciencedirect.com/science/article/pii/S0091674920310277?via%3Dihub>
Findings: We constructed a prospective cohort with 611 adult patients diagnosed with COVID-19 between March 10 and April 12, 2020, in a tertiary hospital in Madrid, Spain. High interleukin-6, C-reactive protein, lactate dehydrogenase, ferritin, D-dimer, neutrophil count, neutrophil-to-lymphocyte (N/L) ratio, and low albumin, lymphocyte count, monocyte count and peripheral blood oxygen saturation/fraction of inspired oxygen ratio (SpO₂/FiO₂), were all predictive of mortality. A multivariable mortality risk model including SpO₂/FiO₂, N/L ratio, LDH, IL-6, and age, was developed and showed high accuracy for the prediction of fatal outcome (AUC=0.94). The optimal cut-off reliably classified patients into survivor and non-survivor, including patients with no initial respiratory distress, with 0.88 sensitivity and 0.89 specificity.
36. **CT lung lesions as predictors of early death or ICU admission in COVID-19 patients.** Ruch Y, Kaeuffer C, Ohana M, et al. *Clin Microbiol Infect*. 2020 Jul 24;S1198-743X(20)30438-9. doi: 10.1016/j.cmi.2020.07.030.
<https://www.sciencedirect.com/science/article/pii/S1198743X20304389?via%3Dihub>
Findings: We studied 572 patients diagnosed with COVID-19, for whom a chest CT was performed at hospital admission. Visual quantification was used to classify patients as per the percentage of lung parenchyma affected by COVID-19 lesions: normal CT, 0%-10%, 11%-25%, 26%-50%, 51%-75%, and >75%. The primary endpoint was severe disease, defined by death or intensive care unit admission in the 7 days following admission. The primary endpoint occurred in 206/572 (36.0%) patients. The extent of lesions on initial CT was independently associated with prognosis. Most patients with lung involvement >50% developed severe disease (66/95,

69.5%), compared to patients with lung involvement of 26%-50% (70/171, 40.9%) and $\leq 25\%$ (70/306, 22.9%) ($p < 0.01$ and $p < 0.01$, respectively). None (0/14) of the patients with normal CT had severe disease. Chest CT findings at admission are associated with bad outcome in COVID-19 patients.

Survivorship & Rehabilitation

37. **Symptom Duration and Risk Factors for Delayed Return to Usual Health Among Outpatients with COVID-19 in a Multistate Health Care Systems Network — United States, March–June 2020.** Tenforde MW, Kim SS, Lindsell CJ, et al. *MMWR Morb Mortal Wkly Rep.* ePub: 24 July 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6930e1> external icon https://www.cdc.gov/mmwr/volumes/69/wr/mm6930e1.htm?s_cid=mm6930e1_w
Findings: In a multistate telephone survey of symptomatic adults who had a positive outpatient test result for SARS-CoV-2 infection, 35% had not returned to their usual state of health when interviewed 2–3 weeks after testing. Among persons aged 18–34 years with no chronic medical conditions, one in five had not returned to their usual state of health. COVID-19 can result in prolonged illness, even among young adults without underlying chronic medical conditions. Effective public health messaging targeting these groups is warranted.

Therapeutics

38. **The hazard of (sub)therapeutic doses of anticoagulants in non-critically ill patients with Covid-19: the Padua province experience.** Pesavento R, Ceccato D, Pasquetto G, et al. *J Thromb Haemost.* 2020 Jul 21. doi: 10.1111/jth.15022. <https://onlinelibrary.wiley.com/doi/abs/10.1111/jth.15022>
Findings: The rate of relevant bleeding events were high in patients treated with (sub)therapeutic doses of anticoagulants. In the latter group, overall mortality did not differ from that of patients treated with standard prophylactic doses and was even higher. Our result does not support a strategy of giving (sub)therapeutic doses of anticoagulants in non-critically ill patients with COVID-19.
39. **Hydroxychloroquine with or without Azithromycin in Mild-to-Moderate Covid-19.** Cavalcanti AB, Zampieri FG, Rosa RG, et al. *NEJM.* July 23, 2020. DOI: 10.1056/NEJMoa2019014 <https://www.nejm.org/doi/full/10.1056/NEJMoa2019014>
Findings: Among patients hospitalized with mild-to-moderate Covid-19, the use of hydroxychloroquine, alone or with azithromycin, did not improve clinical status at 15 days as compared with standard care.
40. **Efficacy of early prone position for COVID-19 patients with severe hypoxia: a single-center prospective cohort study.** Zang, X., Wang, Q., Zhou, H. et al. *Intensive Care Med* (2020). <https://doi.org/10.1007/s00134-020-06182-4> <https://link.springer.com/article/10.1007%2Fs00134-020-06182-4>
Findings: A total of 60 COVID-19 patients with severe hypoxia were enrolled; and 23 patients were taken early prone position and 37 patients were not. In prone position group, the pulse

oxygen saturation (SpO₂) increased, respiratory rate (RR) decreased, & ROX index increased. Furthermore, the early prone position can also improve the CT imaging performance in some patients. After 90 days of follow-up, 10 (43.5%) COVID-19 patients died in the prone position group, compared with 28 (75.7%) COVID-19 patients in the non-prone position group. As for the potential mechanism of early prone position improving the hypoxia, we speculate that it may be caused by redistribution of blood flow and edema fluid redistributes to the ventral side with gravity and the atrophic alveolar are reopened in the prone position, which cause V/Q improvement.

41. Early IL-1 receptor blockade in severe inflammatory respiratory failure complicating COVID-

19. Cauchois R, Koubi M, Delarbre D, et al. *Proc Natl Acad Sci U S A*. 2020 Jul 22;202009017. doi: 10.1073/pnas.2009017117.

<https://www.pnas.org/content/early/2020/07/21/2009017117>

Findings: Around the tenth day after diagnosis, 20% of patients with COVID-19–associated pneumonia evolve toward severe oxygen dependence and acute respiratory distress syndrome associated with systemic inflammation often termed a “cytokine storm.” Because interleukin-1 (IL-1) blocks the production of IL-6 and other proinflammatory cytokines, we treated COVID-19 patients early in the disease with the IL-1 receptor antagonist, anakinra. We retrospectively compared 22 patients from three different centers in France with COVID-19–associated pneumonia presenting with acute severe respiratory failure and systemic inflammation who received either standard-of-care treatment alone (10 patients) or combined with intravenous anakinra (12 patients). Both populations were comparable for age, comorbidities, clinical stage, and elevated biomarkers of systemic inflammation. Patients treated with anakinra improved clinically ($P < 0.01$), with no deaths, significant decreases in oxygen requirements ($P < 0.05$), and more days without invasive mechanical ventilation ($P < 0.06$), compared with the control group. The effect of anakinra was rapid, as judged by significant decrease of fever and C-reactive protein at day 3. A mean total dose of 1,950 mg was infused with no adverse side effects or bacterial infection. We conclude that early blockade of the IL-1 receptor is therapeutic in acute hyperinflammatory respiratory failure in COVID-19 patients.

42. High-flow nasal cannula oxygen therapy to treat patients with hypoxemic acute respiratory

failure consequent to SARS-CoV-2 infection. Vianello A, Arcaro G, Molena B, et al. *Thorax*. 2020 Jul 23;thoraxjnl-2020-214993. doi: 10.1136/thoraxjnl-2020-214993.

<https://thorax.bmj.com/content/early/2020/07/23/thoraxjnl-2020-214993>

Findings: This observational study aims to assess the outcome and safety of O₂-therapy by high-flow nasal cannula (HFNC) in 28 consecutive patients with severe hypoxemic acute respiratory failure (hARF) consequent to SARS-CoV-2 infection, unresponsive to conventional O₂-therapy. Nineteen patients had a positive response. Nine patients required escalation of treatment to non-invasive ventilation (five subsequently intubated). None of the staff had a positive swab testing during the study period and the following 14 days. Severity of hypoxemia and C reactive protein level were correlated with HFNC failure. These data suggest HFNC to be a safe treatment for less severe patients with SARS-CoV-2 hARF and efficacy will need to be assessed as part of a clinical trial.

43. **Prone cardiopulmonary resuscitation: A scoping and expanded grey literature review for the COVID-19 pandemic.** Douma MJ, Mackenzie E, Loch T, et al. *Resuscitation*. 2020 Jul 21;S0300-9572(20)30285-9. doi: 10.1016/j.resuscitation.2020.07.010.
[https://www.resuscitationjournal.com/article/S0300-9572\(20\)30285-9/fulltext](https://www.resuscitationjournal.com/article/S0300-9572(20)30285-9/fulltext)
Findings: Of 453 identified studies, 24 (5%) studies met our inclusion criteria. This scoping review did not identify sufficient evidence to justify a systematic review or modified resuscitation guidelines. It remains reasonable to initiate resuscitation in the prone position if turning the patient supine would lead to delays or risk to providers or patients. Prone resuscitation quality can be judged using end-tidal CO₂, and arterial pressure tracing, with patients turned supine if insufficient.
44. **Remdesivir for Severe COVID-19 versus a Cohort Receiving Standard of Care.** Olender SA, Perez KK, Go AS, et al. *Clin Infect Dis*. 2020 Jul 24;ciaa1041. doi: 10.1093/cid/ciaa1041.
<https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa1041/5876045>
Findings: We compared the efficacy of the antiviral agent, remdesivir, versus standard-of-care treatment in adults with severe COVID-19 using data from a phase 3 remdesivir trial and a retrospective cohort of patients with severe COVID-19 treated with standard-of-care. 312 and 818 patients were counted in the remdesivir- and non-remdesivir-cohorts, respectively. At day 14, 74.4% of patients in the remdesivir-cohort had recovered versus 59.0% in the non-remdesivir-cohort. At day 14, 7.6% of patients in the remdesivir-cohort had died versus 12.5% in the non-remdesivir-cohort. In this comparative analysis, by day 14, remdesivir was associated with significantly greater recovery and 62% reduced odds of death versus standard-of-care treatment in patients with severe COVID-19.
45. **Association between NSAIDs use and adverse clinical outcomes among adults hospitalized with COVID-19 in South Korea: A nationwide study.** Jeong HE, Lee H, Shin HJ, et al. *Clin Infect Dis*. 2020 Jul 27;ciaa1056. doi: 10.1093/cid/ciaa1056.
<https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa1056/5876905>
Findings: Of 1,824 adults hospitalized with COVID-19 (mean age 49.0 years; female 59%), 354 were NSAIDs users and 1,470 were non-users. Compared with non-use, NSAIDs use was associated with increased risks of the primary composite outcome (OR 1.54 [95% CI 1.13-2.11]) but insignificantly associated with cardiovascular complications (1.54 [0.96-2.48]) or acute renal failure (1.45 [0.49-4.14]). While awaiting the results of confirmatory studies, we suggest NSAIDs be used with caution among patients with COVID-19 as the harms associated with their use may outweigh their benefits in this population.
46. **Non-Steroidal Anti-Inflammatory Drugs and the Risk of Pneumonia Complications: A Systematic Review.** Sodhr M, Khosrow-Khavar F, FitzGerald JM, et al. *Pharmacotherapy*. 2020 Jul 26. doi: 10.1002/phar.2451.
<https://accpjournals.onlinelibrary.wiley.com/doi/abs/10.1002/phar.2451>
Findings: Ten studies met the inclusion criteria including: five nested case-control studies, two population-based case-control studies, and three cohort-studies. In total, 59,724 adults were included from four of the studies (range 57-59,250) and 1,217 children from five studies (range 148-540). All studies demonstrated a positive association; in adults (Odds Ratio/Risk Ratio

range: 1.8-8.1) and children (Odds Ratio/Risk Ratio range: 1.9-6.8). Studies were limited by moderate or serious risk of confounding bias, exposure misclassification, and protopathic biases and sparse data bias. The results of this review demonstrate that published studies on the effect of NSAIDs use and risk of pneumonia complications are subject to a number of biases. These results should not be extrapolated as evidence of harm for NSAIDs, including ibuprofen, in respiratory ailments but highlight the need for more methodologically robust studies to evaluate this potential relationship.

Transmission / Infection Control

47. **Monitoring approaches for health-care workers during the COVID-19 pandemic.** Bielicki JA, Duval X, Gobat N, et al. *Lancet Infect Dis.* 2020 Jul 23;S1473-3099(20)30458-8. doi: 10.1016/S1473-3099(20)30458-8. <https://www.sciencedirect.com/science/article/pii/S1473309920304588?via%3Dihub>
Findings: Specific recommendations for monitoring health-care workers for potential SARS-CoV-2 infection should be available for all staff who are expecting to see or currently managing patients with COVID-19. We feel that in a strict containment phase with low levels of community circulation, management strategies should closely align with those defined for exposed and infected members of the general public, meaning that quarantine and isolation will be stringently applied. Given that outbreaks put excess pressure on the health-care system, special provisions for health-care workers are unlikely to be needed or justifiable. However, beyond this stage, algorithms for accelerated redeployment of mildly symptomatic health-care workers might be necessary to safeguard adequate staffing levels for patient care, and a very low threshold for access to testing should be instituted to support this. Clearly, health-care workers returning to work must prioritise their clinical and psychological wellbeing and consequent ability to re-enter the workspace.

48. **Face coverings and mask to minimise droplet dispersion and aerosolisation: a video case study.** Bahl P, Bhattacharjee S, de Silva C, et al. *Thorax.* 24 July 2020. doi: 10.1136/thoraxjnl-2020-215748 <https://thorax.bmj.com/content/early/2020/07/24/thoraxjnl-2020-215748>
Findings: To evaluate the effectiveness of the CDC recommended one- and two-layer cloth face covering against a three-ply surgical mask, we challenged the cloth covering against speaking, coughing and sneezing. From video it can be observed that, for speaking, a single-layer cloth face covering reduced the droplet spread but a double-layer covering performed better. Even a single-layer face covering is better than no face covering. However, a double-layer cloth face covering was significantly better at reducing the droplet spread caused by coughing and sneezing. A surgical mask was the best among all the tested scenarios in preventing droplet spread from any respiratory emission. These visualisations show the value of using face masks and the difference between types of masks. Several other factors determine the efficacy of cloth masks such as type of material, the number of layers, the arrangement of different layers and frequency of washing. However, based on the visualisations presented, in case of shortages of surgical masks, a cloth face covering with at least two layers is preferable to a single-layer one. Guidelines on home-made cloth masks should stipulate multiple layers (at least 3).

49. **Particle sizes of infectious aerosols: implications for infection control.** Fennelly KP. *Lancet Respir Med.* 2020 Jul 24;S2213-2600(20)30323-4. doi: 10.1016/S2213-2600(20)30323-4. <https://www.sciencedirect.com/science/article/pii/S2213260020303234?via%3Dihub>
Findings: Studies of cough aerosols and of exhaled breath from patients with various respiratory infections have shown striking similarities in aerosol size distributions, with a predominance of pathogens in small particles (<5 µm). These are immediately respirable, suggesting the need for personal respiratory protection (respirators) for individuals close to patients with potentially virulent pathogens. There is no evidence that some pathogens are carried only in large droplets. Surgical masks might offer some respiratory protection from inhalation of infectious aerosols, but not as much as respirators. However, surgical masks worn by patients reduce exposures to infectious aerosols to health-care workers and other individuals. The variability of infectious aerosol production, with some so-called super-emitters producing much higher amounts of infectious aerosol than most, might help to explain the epidemiology of super-spreading. Airborne infection control measures are indicated for potentially lethal respiratory pathogens such as severe acute respiratory syndrome coronavirus 2.
50. **Estimation of Viral Aerosol Emissions from Simulated Individuals with Asymptomatic to Moderate Coronavirus Disease 2019.** Riediker M, Tsai DH. *JAMA Netw Open.* 2020 Jul 1;3(7):e2013807. doi: 10.1001/jamanetworkopen.2020.13807. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2768712>
Findings: In this mathematical modeling study, breathing and coughing by a simulated individual with COVID-19 were estimated to release large numbers of viruses in a poorly ventilated room with a coughing person. However, the estimated infectious risk posed by a person with typical viral load who breathes normally was low, and only few people with very high viral load posed an infection risk in a poorly ventilated closed environment. These results may partially explain the observed rates of transmission and suggest that there is a need for strict respiratory protection when people are in the same room with an individual with COVID-19.

Vaccine - See 3 large studies included in [COVID Resource Desk week 13](#)

Whole Person Care

51. **Increasing Critical Care Nurse Engagement of Palliative Care during the COVID-19 Pandemic.** Rosa WE, Ferrell BR, Wiencek C, et al. *Crit Care Nurse.* 2020 Jul 23;e1-e8. doi: 10.4037/ccn2020946. <https://aacnjournals.org/ccnonline/article/doi/10.4037/ccn2020946/31109/Increasing-Critical-Care-Nurse-Engagement-of>
Findings: Nurses should focus on a strategic integration of palliative care, critical care, and ethically based care during times of normalcy and of crisis. Primary palliative care should be provided for each patient and family, and specialist services sought, as appropriate. Nurse educators are encouraged to use these recommendations and resources in their curricula and training. Palliative care is critical care. Critical care nurses are the frontline responders capable

of translating this holistic, person-centered approach into pragmatic services and relationships throughout the critical care continuum.

Women & Children

52. **Antibody responses to SARS-CoV2 are distinct in children with MIS-C compared to adults with COVID-19.** Weisberg SP, Connors T, Zhu Y, et al. *MedRxiv* PREPRINT. 2020 Jul 14;2020.07.12.20151068. doi: 10.1101/2020.07.12.20151068.

<https://www.medrxiv.org/content/10.1101/2020.07.12.20151068v1>

Findings: Clinical manifestations of COVID-19 caused by the novel coronavirus SARS-CoV-2 are associated with age. While children are largely spared from severe respiratory disease, they can present with a SARS-CoV-2-associated MIS-C similar to Kawasaki's disease. Here, we show distinct antibody (Ab) responses in children with MIS-C compared to adults with severe COVID-19 causing ARDS, and those who recovered from mild disease. There was a reduced breadth and specificity of anti-SARS-CoV-2-specific antibodies in MIS-C patients compared to the COVID patient groups; MIS-C predominantly generated IgG Abs specific for the Spike (S) protein but not for the nucleocapsid (N) protein, while both COVID-19 cohorts had anti-S IgG, IgM and IgA Abs, as well as anti-N IgG Abs. Moreover, MIS-C patients had reduced neutralizing activity compared to COVID-19 cohorts, indicating a reduced protective serological response. These results suggest a distinct infection course and immune response in children and adults who develop severe disease, with implications for optimizing treatments based on symptom and age.

53. **Influence of Race and Ethnicity on Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection Rates and Clinical Outcomes in Pregnancy.** Emeruwa UN, Spiegelman J, Ona S, et al. *Obstet Gynecol*. 2020 Jul 21. doi: 10.1097/AOG.0000000000004088.

https://journals.lww.com/greenjournal/Citation/9000/Influence_of_Race_and_Ethnicity_on_Severe_Acute.97290.aspx

Findings: In this cohort, Hispanic women were disproportionately represented among those affected by SARS-CoV-2 infection, suggesting some disparity in infection risk. But our data do not demonstrate any racial-ethnic differences in infection-associated or perinatal outcomes among pregnant women with SARS-CoV-2 infection. Although we may be underpowered to detect existing disparities, it is alternatively possible that disparities in SARS-CoV-2-specific outcomes in fact did not exist in this population. During the pandemic, strategies to preserve provision of care for pregnant women at our institution who tested positive for SARS-CoV-2 infection included the rapid creation of dedicated COVID-19 telehealth clinics,⁸ which may have mitigated differences between groups.

54. **Neonatal management and outcomes during the COVID-19 pandemic: an observation cohort study.** Salvatore CM, Han J, Acker KP, et al. *Lancet Child Adolesc Health*. 2020 Jul 23;S2352-4642(20)30235-2. doi: 10.1016/S2352-4642(20)30235-2.

<https://www.sciencedirect.com/science/article/pii/S2352464220302352?via%3Dihub>

Findings: Our data suggest that perinatal transmission of COVID-19 is unlikely to occur if correct hygiene precautions are undertaken, and that allowing neonates to room in with their mothers

and direct breastfeeding are safe procedures when paired with effective parental education of infant protective strategies.

55. **Well-being of Parents and Children during the COVID-19 Pandemic: A National Survey.** Patrick SW, Henkhaus LE, Zickafoose JS, et al. *Pediatrics*. 2020 Jul 24;e2020016824. doi: 10.1542/peds.2020-016824.
<https://pediatrics.aappublications.org/content/early/2020/07/22/peds.2020-016824>
Findings: Since March 2020, 27% of parents reported worsening mental health for themselves, and 14% reported worsening behavioral health for their children. The proportion of families with moderate or severe food insecurity increased from 6% before March 2020 to 8% after, employer sponsored insurance coverage of children decreased from 63% to 60%, and 24% of parents reported a loss of regular childcare. Worsening mental health for parents occurred alongside worsening behavioral health for children in nearly 1 in 10 families, among whom 48% reported loss of regular childcare, 16% reported change in insurance status, and 11% reported worsening food security.

GUIDELINES & CONSENSUS STATEMENTS

Speech-Language Pathology Management for Adults With COVID-19 in the Acute Hospital Setting: Initial Recommendations to Guide Clinical Practice. Namasivayam-MacDonald AM, Riquelme LF. *Am J Speech Lang Pathol*. 2020 Jul 17;1-16. doi: 10.1044/2020_AJSLP-20-00096.

AAP - [Management of Infants Born to Mothers with Suspected or Confirmed COVID-19.](#)

AAP – [Interim Guidance COVID-19 Return to Sports.](#)

American College of Rheumatology Clinical Guidance for Pediatric Patients with Multisystem Inflammatory Syndrome in Children (MIS-C) Associated with SARS-CoV-2 and Hyperinflammation in COVID-19. Version 1. Henderson LA, Canna SW, Friedman KG, et al. *Arthritis Rheumatol*. 2020 Jul 23. doi: 10.1002/art.41454.

Hand Hygiene during COVID-19: Recommendations from the American Contact Dermatitis Society. Rundle CW, Presley CL, Militello M, et al. *J Am Acad Dermatol*. 2020 Jul 21;S0190-9622(20)32256-8. doi: 10.1016/j.jaad.2020.07.057.

FDA / CDC / NIH / WHO Updates

CDC: [Duration of Isolation and Precautions for Adults with COVID-19](#) – updated July 22, 2020

Press Release

[Phase 3 clinical trial of investigational vaccine for COVID-19 begins: Multi-site trial to test candidate developed by Moderna and NIH.](#) also [Moderna Announces Phase 3 COVE Study of mRNA Vaccine Against COVID-19 \(mRNA-1273\) Begins.](#)

Commentary

[Amy Compton-Phillips, MD on current state of pandemic.](#) CNN, July 22, 2020

[Pooling Data From Individual Clinical Trials in the COVID-19 Era.](#)

[The Advisory Committee on Immunization Practices and Its Role in the Pandemic Vaccine Response.](#)

[You Need a Herd for Herd Immunity.](#)

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