

COVID-19 Resource Desk

#28 | 10.27.2020 to 11.3.2020

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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. **On-Mask Chemical Modulation of Respiratory Droplets.** Huang H, Park H, Liu Y, et al. *Matter*. October 29, 2020 DOI:<https://doi.org/10.1016/j.matt.2020.10.012>
[https://www.cell.com/matter/fulltext/S2590-2385\(20\)30566-X](https://www.cell.com/matter/fulltext/S2590-2385(20)30566-X)
Findings: We propose an on-mask chemical modulation strategy to enhance this function by making the escaped droplets less infectious. As a proof of concept, antipathogen agents (e.g., mineral acid and copper salt) preloaded on nonwoven fabrics are shown to transfer to and are concentrated in escaped droplets to the level capable of deactivating pathogens. We hope that this approach leads to additional work, which, if eventually adopted, can help to cut down the sources of transmission and strengthen the public health response to control and mitigate the outbreak of infectious respiratory diseases.

Clinical Syndrome

2. **Broadly-targeted autoreactivity is common in severe SARS-CoV-2 Infection.** Woodruff MC, Ramonell RP, Lee FE, et al. *medRxiv PREPRINT* Oct 23, 2020. doi: <https://doi.org/10.1101/2020.10.21.20216192>
Findings: Severe SARS-CoV-2 infection is linked to the presence of autoantibodies against multiple targets, including phospholipids and type-I interferons. We recently identified activation of an autoimmune-prone B cell response pathway as correlate of severe COVID-19, raising the possibility of de novo autoreactive antibody production during the antiviral response. Here, we identify autoreactive antibodies as a common feature of severe COVID-19, identifying biomarkers of tolerance breaks that may indicate aggressive immunomodulation. These patients are producing molecules called “autoantibodies” that target genetic material from human cells, instead of from the virus. This misguided immune response may exacerbate severe Covid-19. It may also explain why so-called “long haulers” have lingering problems months after their initial illness has resolved and the virus is gone from their bodies.
3. **Ischemic Stroke Occurs Less Frequently in Patients With COVID-19: A Multicenter Cross-Sectional Study.** Bekelis K, Missios S, Ahmad J, et al. *Stroke*. 2020 Oct

27:STROKEAHA120031217. doi: 10.1161/STROKEAHA.120.031217.

<https://www.ahajournals.org/doi/10.1161/STROKEAHA.120.031217>

Findings: Among 24 808 discharges, 2513 (10.1%) were diagnosed with COVID-19, and 566 (0.2%) presented with acute ischemic stroke. Patients diagnosed with COVID-19 were at one-quarter the odds of stroke compared with other patients. This association was consistent in all age groups. In patients presenting with stroke, concurrent infection with SARS-CoV-2 was associated with higher case-fatality and a trend towards increased occurrence of discharge to rehabilitation. Using a comprehensive cross-section of patients from a large NY-based healthcare system, we did not identify a positive association between ischemic stroke and COVID-19. However, patients with stroke with COVID-19 had worse outcomes compared with those without, with over a 9-fold increase in mortality. Although no definitive conclusions can be reached from our observational study, our data do not support the concerns for an epidemic of stroke in young adults with COVID-19.

4. **Incidence of bacterial and fungal bloodstream infections in COVID-19 patients in intensive care: an alarming “collateral effect.”** Cataldo MA, Tetaj N, Selleri M, et al. *J Glob Antimicrob Resist* 2020 Oct 29. <https://doi.org/10.1016/j.jgar.2020.10.004>

<https://www.sciencedirect.com/science/article/pii/S2213716520302654>

Findings: In order to assess the incidence of bacterial and fungal bloodstream infections (BSIs) in COVID-19 patients in Intensive Care, we performed a retrospective cohort study including COVID-19 adult patients hospitalised in intensive care unit (ICU) from March 1st to April 15th. Our findings evidenced an exaggerated risk of acquiring bacterial and fungal BSIs among critically ill patients with COVID-19 in ICU, namely an incidence almost 20 times higher than the incidence reported in European ICUs. In the pre-COVID-19 period, the prevalence of BSI in patients staying in our ICU was 3.8 times lower than the prevalence observed in our ICU COVID-19 patients. Key drivers of the high incidence of bacterial and fungal infections in COVID-19 patients are likely: 1) the immune dysregulation in severe COVID-19; 2) an extensive use of antimicrobials; 3) less adherence with the infection control and prevention (IPC) measures.

5. **Unexpectedly High Frequency of Enterococcal Bloodstream Infections in Coronavirus Disease 2019 Patients Admitted to an Italian ICU: An Observational Study.** Bonazzetti C, Morena V, Giacomelli A, et al. *Crit Care Med*. 2020 Oct 29. doi: 10.1097/CCM.0000000000004748.

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovft&AN=00003246-900000000-95444&PDF=y>

Findings: The frequency of bloodstream infections per 1,000 days of ICU stay was calculated in 89 coronavirus disease 2019 patients. Sixty patients (67.4%) experienced at least one of the 93 recorded episodes of bloodstream infection, a frequency of 87 per 1,000 days of ICU stay. The patients who experienced a bloodstream infection had a higher Sequential Organ Failure Assessment score upon ICU admission, a longer median ICU stay, and more frequently required invasive mechanical ventilation than those who did not. The median time from ICU admission to the first bloodstream infection episode was 10 days. Gram-positive bacteria accounted for 74 episodes (79.6%), with Enterococcus species being the most prevalent (53 episodes, 55.8%). Thirty-two isolates (27.3%) showed multidrug resistance.

6. **Covid-19 and Autoimmune Diseases: A Systematic Review of Reported Cases.** Saad MA, Alfishawy M, Nassar M, et al. *Curr Rheumatol Rev.* 2020 Oct 29. doi: 10.2174/1573397116666201029155856.
Findings: Among 10006 articles, searches yielded, twenty studies meet the eligibility criteria. The twenty eligible articles reported 33 cases of confirmed COVID-19 diagnosis who developed an autoimmune disease after the onset of covid-19 symptoms. Ages of patients varied from a 6 months old infant to 89 years old female (Mean=53.9 years of 28 cases); five cases had no information regarding their age. The time between symptoms of viral illness and onset of autoimmune symptoms ranged from 2 days to 33 days (Mean of the 33 cases=9.8 days). Autoimmune diseases were one case of subacute thyroiditis (3%), two cases of Kawasaki Disease (6.1%), three cases of coagulopathy and antiphospholipid syndrome (9.1%), three cases of immune thrombocytopenic purpura (9.1%), eight cases of autoimmune hemolytic anemia (24.2%), and sixteen cases of Guillain-Barré syndrome (48.5%). COVID-19 has been implicated in the development in a range of autoimmune diseases which may shed a light on the association between autoimmune diseases and infections.
7. **Frequency of venous thromboembolism in 6513 patients with COVID-19: a retrospective study.** Hill JB, Garcia D, Crowther M, et al. *Blood Adv.* 2020 Nov 10;4(21):5373-5377. doi: 10.1182/bloodadvances.2020003083.
<https://ashpublications.org/bloodadvances/article/4/21/5373/469794/Frequency-of-venous-thromboembolism-in-6513>
Findings: Patients infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) appear to be at increased risk for VTE, especially if they become critically ill with COVID-19. Some centers have reported very high rates of thrombosis despite anticoagulant prophylaxis. The EHR of a New Orleans-based health system was searched for all patients with polymerase chain reaction-confirmed SARS-CoV-2 infection who were either admitted to hospital or treated and discharged from an emergency department between 1 March 2020 and 1 May 2020. From this cohort, patients with confirmed VTE (either during or after their hospital encounter) were identified by administrative query of the HER. Between 1 March 2020 and 1 May 2020, 6153 patients with COVID-19 were identified; 2748 of these patients were admitted, while 3405 received care exclusively through the emergency department. In total, 637 patients required mechanical ventilation and 206 required renal replacement therapy. Within the hospitalized cohort, the overall mortality rate was 24.5% and VTE occurred in 86 patients (3.1%). In the 637 patients who required mechanical ventilation at some point during their hospital stay, 45 developed VTE (7.2%). After a median follow-up of 14.6 days, VTE had been diagnosed in 3 of the 2075 admitted who were discharged alive (0.14%). Among 6153 patients with COVID-19 who were hospitalized or treated in emergency departments, we did not find evidence of unusually high VTE risk. Pending further evidence from prospective, controlled trials, our findings support a traditional approach to primary VTE prevention in patients with COVID-19.
8. **Clinical and Microbiological Features of Asymptomatic SARS-CoV-2 Infection and Mild COVID-19 in Seven Crewmembers of a Cruise Ship.** Hoshiyama T, Wada T, Nihonyanagi S, et al. *Intern Med.* 2020 Nov 2. doi: 10.2169/internalmedicine.5601-20.

https://www.jstage.jst.go.jp/article/internalmedicine/advpub/0/advpub_5601-20/pdf/char/en

Findings: The median age of the 7 patients, of whom 4 were male and 3 were female, was 39 years. On admission, none of them had fever, but 4 (57%) had a cough. None of them showed any signs of organ damage on laboratory testing. Chest X-ray showed pneumonia in one individual, which resolved spontaneously, while the other 6 had normal chest X-ray findings. Culture of throat swabs and sputum samples revealed that 4 patients (57%) had bacterial upper respiratory infections. The period from a positive PCR test to negative conversion ranged from 5 to 13 days, with a median of 8 days. Healthy young adults without risk factors who acquire SARS-CoV-2 infection may have an asymptomatic infection or may experience mild COVID-19. In addition to obesity, an older age, underlying illness, and being overweight can lead to a risk of exacerbation; thus, hospital management for such individuals may be desirable.

Diagnosics & Screening

9. **Evaluation of SARS-CoV-2 IgG antibody response in PCR positive patients: Comparison of nine tests in relation to clinical data.** Naaber P, Hunt K, Pesukova J, et al. *PLoS One*. 2020 Oct 27;15(10):e0237548. doi: 10.1371/journal.pone.0237548.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0237548>

Findings: We here compared the sensitivity and specificity of seven commercial (SNIBE, Epitope, Euroimmun, Roche, Abbott, DiaSorin, Biosensor) and two in-house LIPS assays (LIPS N and LIPS S-RBD) IgG/total Ab tests in serum samples from 97 COVID-19 patients and 100 controls and correlated the results with the patients' clinical data and the time-point the test was performed. We found a remarkable variation in the sensitivity of antibody tests with the following performance: LIPS N (91.8%), Epitope (85.6%), Abbott and in-house LIPS S-RBD (both 84.5%), Roche (83.5%), Euroimmun (82.5%), DiaSorin (81.4%), SNIBE (70.1%), and Biosensor (64.9%). The overall agreement between the tests was between 71-95%, whereas the specificity of all tests was within 98-100%. Our study highlights the importance to consider clinical symptoms, time of testing, and using more than one viral antigen in SARS-CoV-2 antibody testing. Our results suggest that some antibody tests are more sensitive for the detection of antibodies in early stage and asymptomatic patients, which may explain the contradictory results of previous studies and should be taken into consideration in clinical practice and epidemiological studies.

10. **Wearable sensor data and self-reported symptoms for COVID-19 detection.** Quer G, Radin JM, Gadaleta M, et al. *Nat Med*. 2020 Oct 29. doi: 10.1038/s41591-020-1123-x.

<https://www.nature.com/articles/s41591-020-1123-x>

Findings: We explore whether personal sensor data collected over time may help identify subtle changes indicating an infection, such as in patients with COVID-19. We have developed a smartphone app that collects smartwatch and activity tracker data, as well as self-reported symptoms and diagnostic testing results, from individuals in the United States, and have assessed whether symptom and sensor data can differentiate COVID-19 positive versus negative cases in symptomatic individuals. We enrolled 30,529 participants between 25 March and 7 June 2020, of whom 3,811 reported symptoms. Of these symptomatic individuals, 54

reported testing positive and 279 negative for COVID-19. We found that a combination of symptom and sensor data resulted in an area under the curve (AUC) of 0.80 for discriminating between symptomatic individuals who were positive or negative for COVID-19, a performance that is significantly better than a model that considers symptoms alone. Such continuous, passively captured data may be complementary to virus testing, which is generally a one-off or infrequent sampling assay.

11. **Chest CT findings in patients with coronavirus disease 2019 (COVID-19): a comprehensive review.** Li J, Yan R, Zhai Y, et al. *Diagn Interv Radiol.* 2020 Nov 2. doi: 10.5152/dir.2020.20212. <https://www.dirjournal.org/en/chest-ct-findings-in-patients-with-coronavirus-disease-2019-covid-19-a-comprehensive-review-168062>

Findings: A total of 84 articles with more than 5340 participants were included and reviewed. Chest CT comprised 92.61% of abnormal CT findings overall. Compared with real-time polymerase chain reaction result, CT findings has a sensitivity of 96.14% but a low specificity of 40.48% in diagnosing COVID-19. Ground glass opacity, pure (57.31%) or mixed with consolidation (41.51%) were the most common CT features with a majority of bilateral (80.32%) and peripheral (66.21%) lung involvement. The opacity might associate with other imaging features, including air bronchogram (41.07%), vascular enlargement (54.33%), bronchial wall thickening (19.12%), crazy-paving pattern (27.55%), interlobular septal thickening (42.48%), halo sign (25.48%), reverse halo sign (12.29%), bronchiectasis (32.44%), and pulmonary fibrosis (26.22%). Other accompanying signs including pleural effusion, lymphadenopathy and pericardial effusion were rare, but pleural thickening was common. The younger or early stage patients tended to have more GGOs, while extensive/multilobar involvement with consolidation was prevalent in the older or severe population. Children with COVID-19 showed significantly lower incidences of some ancillary findings than those of adults and showed a better performance on CT during follow up. Follow-up CT showed GGO lesions gradually decreased, and the consolidation lesions first increased and then remained relatively stable at 6-13 days, and then absorbed and fibrosis increased after 14 days. Chest CT imaging is an important component in the diagnosis, staging, disease progression and follow-up of patients with COVID-19.

12. **Evaluation of the Truvian Easy Check COVID-19 IgM/IgG Lateral Flow Device for Rapid Anti-SARS-CoV-2 Antibody Detection.** Chan CW, Shahul S, Coleman C, et al. *Am J Clin Pathol.* 2020 Nov 2:aqaa221. doi: 10.1093/ajcp/aqaa221. <https://academic.oup.com/ajcp/advance-article/doi/10.1093/ajcp/aqaa221/5948895>

Findings: The Easy Check device was analytically evaluated and its performance was compared with the Roche Elecsys anti-SARS-CoV-2 antibody assay. The test was further characterized for cross-reactivity using sera obtained from patients infected by other viruses. Clinical performance was analyzed with polymerase chain reaction-confirmed samples and a 2015 prepandemic reference sample set. The Easy Check device showed excellent analytical performance and compares well with the Roche Elecsys antibody assay, with an overall concordance of 98.6%. Clinical performance showed a sensitivity of 96.6%, a specificity of 98.2%, and an overall accuracy of 98.1%. The Easy Check device is a simple, reliable, and rapid

test for detection of SARS-CoV-2 seropositivity, and its performance compares favorably against the automated Roche Elecsys antibody assay.

Epidemiology & Public Health

- 13. Association between SARS-CoV-2 infection, exposure risk and mental health among a cohort of essential retail workers in the USA.** Lan F-Y, Suharlim C, Kales SN, Yang J. *Occup Environ Med.* 2020 Oct 30. doi: <http://dx.doi.org/10.1136/oemed-2020-106774>
<https://oem.bmj.com/content/early/2020/10/11/oemed-2020-106774>
Results. Among 104 workers tested, 21 (20%) had positive viral assays. Seventy-six per cent positive cases were asymptomatic. Employees with direct customer exposure had an odds of 5.1 being tested positive for SARS-CoV-2 after adjustments. As to mental health, the prevalence of anxiety and depression was 24% and 8%, respectively. After adjusting for potential confounders, those able to practice social distancing consistently at work had odds of 0.3 and 0.2 screening positive for anxiety and depression, respectively. Workers commuting by foot, bike or private cars were less likely to screen positive for depression. In this single store sample, we found a considerable asymptomatic SARS-CoV-2 infection rate among grocery workers. Employees with direct customer exposure were five times more likely to test positive for SARS-CoV-2. Those able to practice social distancing consistently at work had significantly lower risk of anxiety or depression.
- 14. Transmission of SARS-COV-2 Infections in Households — Tennessee and Wisconsin, April–September 2020.** Grijalva CG, Rolfes MA, Zhu Y, et al. *MMWR Morb Mortal Wkly Rep.* ePub: 30 October 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6944e1>
https://www.cdc.gov/mmwr/volumes/69/wr/mm6944e1.htm?s_cid=mm6944e1_x
Findings: Findings from a prospective household study with intensive daily observation for ≥7 consecutive days indicate that transmission of SARS-CoV-2 among household members was frequent from either children or adults. Household transmission of SARS-CoV-2 is common and occurs early after illness onset. Persons should self-isolate immediately at the onset of COVID-like symptoms, at the time of testing as a result of a high-risk exposure, or at time of a positive test result, whichever comes first. All household members, including the index case, should wear masks within shared spaces in the household.
- 15. Age-specific mortality and immunity patterns of SARS-CoV-2.** O'Driscoll M, Dos Santos GR, Wang L, et al. *Nature.* 2020 Nov 2. doi: 10.1038/s41586-020-2918-0.
<https://www.nature.com/articles/s41586-020-2918-0>
Findings: Here we use age-specific COVID-19 death data from 45 countries and the results of 22 seroprevalence studies to investigate the consistency of infection and fatality patterns across multiple countries. We find that the age distribution of deaths in younger age groups (<65 years) is very consistent across different settings and demonstrate how this data can provide robust estimates of the share of the population that has been infected. We estimate that the infection-to-fatality ratio (IFR) is lowest among 5-9 years old, with a log-linear increase by age among individuals older than 30 years. Population age-structures and heterogeneous burdens in nursing homes explain some but not all of the heterogeneity between countries in infection-

fatality ratios. Among the 45 countries included in our analysis, we estimate approximately 5% of these populations had been infected by the 1st of September 2020, with much higher transmission likely to have occurred in a number of Latin American countries. This simple modelling framework can help countries assess the progression of the pandemic and can be applied wherever reliable age-specific death data exists.

16. **Association of poor housing conditions with COVID-19 incidence and mortality across US counties.** Ahmad K, Erqou S, Shah N, et al. *PLoS One*. 2020 Nov 2;15(11):e0241327. doi: 10.1371/journal.pone.0241327. eCollection 2020.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0241327>

Findings: Across 3135 US counties, the mean percentage of households with poor housing conditions was 14.2%. On April 21st, the mean number of cases and deaths of COVID-19 were 255.68 (2877.03) cases and 13.90 (272.22) deaths per county, respectively. In the adjusted models standardized by county population, with each 5% increase in percent households with poor housing conditions, there was a 50% higher risk of COVID-19 incidence and a 42% higher risk of COVID-19 mortality. Results remained similar using earlier timepoints (3/31/2020 and 4/10/2020). Counties with a higher percentage of households with poor housing had higher incidence of, and mortality associated with, COVID-19. These findings suggest targeted health policies to support individuals living in poor housing conditions should be considered in further efforts to mitigate adverse outcomes associated with COVID-19.

17. **Racial/Ethnic Differences in COVID-19 Screening, Hospitalization, and Mortality in Southeast Wisconsin.** Egede LE, Walker RJ, Garacci E, Raymond JR Sr. *Health Aff (Millwood)*. 2020 Nov;39(11):1926-1934. doi: 10.1377/hlthaff.2020.01081.

Findings: Racial/ethnic differences existed in adults who screened positive for COVID-19 (4.5 percent of non-Hispanic Whites, 14.9 percent of non-Hispanic Blacks, and 14.8 percent of Hispanics). After adjustment for demographics and comorbidities, Blacks and Hispanics were more than three times more likely to screen positive and two times more likely to be hospitalized relative to Whites, and Hispanics were two times more likely to die than Whites. Given the long-standing history of structural racism, residential segregation, and social risk in the US and their role as contributors to poor health, we propose and discuss the part these issues play as explanatory factors for our findings.

Healthcare Delivery & Healthcare Workers

18. **Risk of hospital admission with coronavirus disease 2019 in healthcare workers and their households: nationwide linkage cohort study.** Shah ASV, Wood R, Gribben C, et al. *BMJ*. 2020 Oct 28;371:m3582. doi: 10.1136/bmj.m3582. <https://www.bmj.com/content/371/bmj.m3582>
Findings: The cohort comprised 158 445 healthcare workers, most of them (57.3%) being patient facing, and 229 905 household members. Of all hospital admissions for covid-19 in the working age population (18-65 year olds), 17.2% were in healthcare workers or their households. After adjustment for age, sex, ethnicity, socioeconomic deprivation, and comorbidity, the risk of admission due to covid-19 in non-patient facing healthcare workers and their households was similar to the risk in the general population. In models adjusting for the

same covariates, however, patient facing healthcare workers, compared with non-patient facing healthcare workers, were at higher risk (hazard ratio 3.30), as were household members of patient facing healthcare workers (1.79). After sub-division of patient facing healthcare workers into those who worked in "front door," intensive care, and non-intensive care aerosol generating settings and other, those in front door roles were at higher risk (hazard ratio 2.09,). For most patient facing healthcare workers and their households, the estimated absolute risk of hospital admission with covid-19 was less than 0.5%, but it was 1% and above in older men with comorbidity.

19. **COVID-19-Associated Hospitalizations Among Health Care Personnel - COVID-NET, 13 States, March 1-May 31, 2020.** Kambhampati AK, O'Halloran AC, Whitaker M, et al. *MMWR Morb Mortal Wkly Rep.* 2020 Oct 30;69(43):1576-1583. doi: 10.15585/mmwr.mm6943e3.

<https://www.cdc.gov/mmwr/volumes/69/wr/mm6943e3.htm>

Findings: HCP can be exposed to SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19), both within and outside the workplace, increasing their risk for infection. Among 6,760 adults hospitalized during March 1-May 31, 2020, for whom HCP status was determined by the COVID-19-Associated Hospitalization Surveillance Network (COVID-NET), 5.9% were HCP. Nursing-related occupations (36.3%) represented the largest proportion of HCP hospitalized with COVID-19. Median age of hospitalized HCP was 49 years, and 89.8% had at least one underlying medical condition, of which obesity was most commonly reported (72.5%). A substantial proportion of HCP with COVID-19 had indicators of severe disease: 27.5% were admitted to an intensive care unit (ICU), 15.8% required invasive mechanical ventilation, and 4.2% died during hospitalization. HCP can have severe COVID-19-associated illness, highlighting the need for continued infection prevention and control in health care settings as well as community mitigation efforts to reduce transmission.

20. **Logistical Considerations and Clinical Outcomes Associated with Converting Operating Rooms into an Intensive Care Unit during the Covid-19 Pandemic in a New York City Hospital.** Mittel AM, Panzer O, Wang DS, et al. *Anesth Analg.* 2020 Oct 28. doi:

10.1213/ANE.0000000000005301. [https://journals.lww.com/anesthesia-](https://journals.lww.com/anesthesia-analgesia/Abstract/9000/Logistical_Considerations_and_Clinical_Outcomes.95414.aspx)

[analgesia/Abstract/9000/Logistical_Considerations_and_Clinical_Outcomes.95414.aspx](https://journals.lww.com/anesthesia-analgesia/Abstract/9000/Logistical_Considerations_and_Clinical_Outcomes.95414.aspx)

Findings: The ORICU cared for 133 patients from March 24 - May 14, 2020. Patients were transferred to the ORICU from other ICUs, inpatient wards, the Emergency Department, and other institutions. Patients remained in the ORICU until either transfer to another unit or death. As the hospital patient load decreased, patients were transferred out of the ORICU. This process was completed on May 14, 2020. At time of data censoring, 55 (41.4%) of patients had died. The estimated probability of survival 30 days after admission was 0.61. Age was significantly associated with increased risk of mortality. Patients who were 65 years or older were an estimated 3.17 times more likely to die than younger patients when adjusting for gender and BMI. A large number of critically ill Covid-19 patients were cared for in the ORICU, which substantially increased ICU capacity at NYP-Columbia. The estimated ORICU survival rate at 30 days was comparable to other reported rates, suggesting this was an effective approach to manage the influx of critically ill Covid-19 patients during a time of crisis.

Laboratory Results

21. **Robust neutralizing antibodies to SARS-CoV-2 infection persist for months.** Wajnberg A, Amanat F, Firpo A, et al. *Science* Oct 2020 Oct 28. DOI: 10.1126/science.abd7728
<https://science.sciencemag.org/content/early/2020/10/27/science.abd7728>
Findings: Here we report that the vast majority of infected individuals with mild-to-moderate COVID-19 experience robust IgG antibody responses against the viral spike protein, based on a dataset of 30,082 individuals screened at Mount Sinai Health System in New York City. We also show that titers are relatively stable for at least a period approximating 5 months and that anti-spike binding titers significantly correlate with neutralization of authentic SARS-CoV-2. Our data suggests that more than 90% of seroconverters make detectible neutralizing antibody responses. These titers remain relatively stable for several months after infection.
22. **Multi-omics resolves a sharp disease-state shift between mild and moderate COVID-19.** Su Y, Chen D, Yuan D, the ISB-Swedish COVID19 Biobanking Unit, et al. [*PSJH authors*]. *Cell*. October 28, 2020 DOI:<https://doi.org/10.1016/j.cell.2020.10.037>
[https://www.cell.com/cell/fulltext/S0092-8674\(20\)31444-6](https://www.cell.com/cell/fulltext/S0092-8674(20)31444-6)
Findings: We present an integrated analysis of the clinical measurements, immune cells and plasma multi-omics of 139 COVID-19 patients representing all levels of disease severity, from serial blood draws collected during the first week of infection following diagnosis. We identify a major shift between mild and moderate disease, at which point elevated inflammatory signaling is accompanied by the loss of specific classes of metabolites and metabolic processes. Within this stressed plasma environment at moderate disease, multiple unusual immune cell phenotypes emerge and amplify with increasing disease severity. We condensed over 120,000 immune features into a single axis to capture how different immune cell classes coordinate in response to SARS-CoV-2. This immune-response axis independently aligns with the major plasma composition changes, with clinical metrics of blood clotting, and with the sharp transition between mild and moderate disease. This study suggests that moderate disease may provide the most effective setting for therapeutic intervention.
23. **Laboratory Findings Associated with Severe Illness and Mortality Among Hospitalized Individuals with Coronavirus Disease 2019 in Eastern Massachusetts.** Castro VM, McCoy TH, Perlis RH. *JAMA Netw Open*. 2020 Oct 1;3(10):e2023934.
doi:10.1001/jamanetworkopen.2020.23934.
<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2772376>
Findings: Of 2511 hospitalized individuals who tested positive for SARS-CoV-2 (of whom 50.9% were male, 53.9% White, and 27.0% Hispanic, with a mean age of 62.6 years), 8.6% were admitted to the intensive care unit, 6.5% required mechanical ventilation, and 11.6% died. In total, 212 of 292 deaths (72.6%) occurred in the highest-risk mortality quintile. In this cohort, specific admission laboratory studies in concert with sociodemographic features and prior diagnosis facilitated risk stratification among individuals hospitalized for COVID-19.

24. Sustained cellular immune dysregulation in individuals recovering from SARS-CoV-2 infection.

Files JK, Boppana S, Perez MD, et al. *J Clin Invest*. 2020 Oct 29:140491. doi: 10.1172/JCI140491. <https://www.jci.org/articles/view/140491>

Findings: In this study, we examined immune cell subsets in hospitalized and non-hospitalized individuals. In hospitalized patients, many adaptive and innate immune cells were decreased in frequency compared to healthy and convalescent individuals, with the exception of B lymphocytes which increased. Our findings show increased frequencies of T-cell activation markers (CD69, Ox40, HLA-DR and CD154) in hospitalized patients, with other T-cell activation/exhaustion markers (CD25, PD-L1 and TIGIT) remaining elevated in hospitalized and non-hospitalized individuals. B cells had a similar pattern of activation/exhaustion, with increased frequency of CD69 and CD95 during hospitalization, followed by an increase in PD1 frequencies in non-hospitalized individuals. Interestingly, many of these changes were found to increase over time in non-hospitalized longitudinal samples, suggesting a prolonged period of immune dysregulation following SARS-CoV-2 infection. Changes in T-cell activation/exhaustion in non-hospitalized patients were found to positively correlate with age. Severely infected individuals had increased expression of activation and exhaustion markers. These data suggest a prolonged period of immune dysregulation following SARS-CoV-2 infection highlighting the need for additional studies investigating immune dysregulation in convalescent individuals.

Prognosis

25. Integrated Survival Estimates for Cancer Treatment Delay Among Adults with Cancer During the COVID-19 Pandemic. Hartman HE, Sun Y, Devasia TP, et al. *JAMA Oncol*. October 29, 2020.

doi:10.1001/jamaoncol.2020.5403

<https://jamanetwork.com/journals/jamaoncology/fullarticle/2772175?resultClick=1>

Findings: Cancer treatment delay has been reported to variably impact cancer-specific survival and COVID-19–specific mortality. During the pandemic, treatment delay is being recommended in a nonquantitative, nonobjective, and nonpersonalized manner, and this approach may be associated with suboptimal outcomes. In this decision analytical modeling study including data from more than 6 million patients with cancer, the OncCOVID model found heterogeneity regarding the impact of delayed cancer treatment owing to patient and cancer factors that are not currently captured by commonly used triage systems. Whether delayed cancer treatment harms or improves expected survival compared with immediate treatment is dependent on patient, cancer, treatment, and community factors. The study’s results indicate that the OncCOVID web application may allow clinicians to estimate the net impact of delayed cancer treatment for individual patients and to prioritize patients for immediate treatment in settings with limited treatment capacity.

26. Outcomes of patients with hematologic malignancies and COVID-19: A systematic review and meta-analysis of 3377 patients. Vijenthira A, Gong IY, Fox TA, et al. *Blood*. 2020 Oct

28:blood.2020008824. doi: 10.1182/blood.2020008824.

<https://ashpublications.org/blood/article/doi/10.1182/blood.2020008824/469789/Outcomes-of-patients-with-hematologic-malignancies>

Findings: Outcomes for patients with hematologic malignancy infected with COVID-19 have not been aggregated. The objective of this study was to perform a systematic review and meta-analysis to estimate the risk of death and other important outcomes for these patients. 34 adult and 5 pediatric studies (3377 patients) from Asia, Europe, and North America were included (14/34 adult studies included only hospitalized patients). The risk of death amongst adult patients was 34% in this sample of predominantly hospitalized patients. Patients aged >60 years had a significantly higher risk of death than patients <60 years. The risk of death in pediatric patients was 4%. The RR of death comparing patients with recent systemic anti-cancer therapy to no treatment was 1.17. Adult patients with hematologic malignancy and COVID-19, especially hospitalized patients, have a high risk of dying. Patients >60 years have significantly higher mortality, and pediatric patients appear to be relatively spared. Recent cancer treatment does not appear to significantly increase the risk of death.

27. **SARS-CoV-2 viral load is associated with increased disease severity and mortality.** Fajnzyblber J, Regan J, Coxen K, et al. *Nat Commun.* 2020 Oct 30;11(1):5493. doi: 10.1038/s41467-020-19057-5. <https://www.nature.com/articles/s41467-020-19057-5>

Findings: The relationship between SARS-CoV-2 viral load and risk of disease progression remains largely undefined in coronavirus disease 2019 (COVID-19). Here, we quantify SARS-CoV-2 viral load from participants with a diverse range of COVID-19 disease severity, including those requiring hospitalization, outpatients with mild disease, and individuals with resolved infection. We detected SARS-CoV-2 plasma RNA in 27% of hospitalized participants, and 13% of outpatients diagnosed with COVID-19. Amongst the participants hospitalized with COVID-19, we report that a higher prevalence of detectable SARS-CoV-2 plasma viral load is associated with worse respiratory disease severity, lower absolute lymphocyte counts, and increased markers of inflammation, including C-reactive protein and IL-6. SARS-CoV-2 viral loads, especially plasma viremia, are associated with increased risk of mortality. Our data show that SARS-CoV-2 viral loads may aid in the risk stratification of patients with COVID-19, and therefore its role in disease pathogenesis should be further explored.

28. **Troponin and Other Biomarker Levels and Outcomes Among Patients Hospitalized with COVID-19: Derivation and Validation of the HA(2)T(2) COVID-19 Mortality Risk Score.**

Manocha KK, Kirzner J, Ying X, et al. *J Am Heart Assoc.* 2020 Oct 30:e018477. doi: 10.1161/JAHA.120.018477. <https://www.ahajournals.org/doi/10.1161/JAHA.120.018477>

Findings: An observational cohort study of 1053 patients with COVID-19 was conducted. Patients with the following biomarkers measured: troponin-I (TnI), B-type natriuretic peptide, C-reactive protein, ferritin and D-dimer (n = 446) were identified. Maximum levels for each biomarker were recorded. Primary endpoint was 30-day in-hospital mortality. Multivariable logistic regression was used to construct a mortality risk score. Validation of the risk score was performed using an independent patient cohort (n = 440). Mean age of patients was 65.0 ± 15.2 years and 65.3% were men. Overall, 444 (99.6%) had elevation of any biomarker. Among tested biomarkers, TnI ≥ 0.34 ng/ml was the only independent predictor of 30-day mortality (adjusted OR 4.38; P < 0.001). Patients with a mortality score using hypoxia on presentation, age and TnI elevation, age (HA2T2) ≥ 3 had a 30-day mortality of 43.7% while those with a score < 3 had mortality of 5.9%. Area under the receiver operating characteristic curve of the HA2T2 score

was 0.834 for the derivation cohort and 0.784 for the validation cohort. Conclusions Elevated troponin and other biomarker levels are commonly seen in patients hospitalized with COVID-19. High troponin levels are a potent predictor of 30-day in-hospital mortality. A simple risk score can stratify patients at risk for COVID-19-associated mortality.

29. **Case Fatality Rates for COVID-19 Patients Requiring Invasive Mechanical Ventilation: A Meta-analysis.** Lim ZJ, Subramaniam A, Reddy MP, et al. *Am J Respir Crit Care Med.* 2020 Oct 29. doi: 10.1164/rccm.202006-2405OC. <https://www.atsjournals.org/doi/abs/10.1164/rccm.202006-2405OC>

Findings: Sixty-nine studies were included, describing 57,420 adult patients with COVID-19 who received IMV. Overall reported CFR was estimated as 45%. Fifty-four out of 69 studies stated whether hospital outcomes were available but provided a definitive hospital outcome on only 13,120 (22.8%) of the total IMV patient population. Among studies where age-stratified CFR was available, pooled CFR estimates ranged from 47.9% in younger patients (age ≤40) to 84.4% in older patients (age >80). CFR was also higher in early COVID-19 epicenters. Almost half of COVID-19 patients receiving IMV died, based on the reported CFR, but variable CFR reporting methods resulted in a wide range of CFR between studies. Reported CFR was higher in older patients and in early pandemic epicenters, which may be influenced by limited ICU resources. Reporting of definitive outcomes on all patients would facilitate comparisons between studies.

30. **The Prevalence of Gastrointestinal Symptoms, Abnormal Liver Function, Digestive System Disease and Liver Disease in COVID-19 Infection: A Systematic Review and Meta-Analysis.**

Dong ZY, Xiang BJ, Jiang M, Sun MJ, Dai C. *J Clin Gastroenterol.* 2020 Oct 27. doi: 10.1097/MCG.0000000000001424.

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovft&AN=00004836-900000000-97517&PDF=y>

Findings: Thirty-one studies involving 4682 patients were included. The most significant GI symptoms were diarrhea and anorexia. The most significant abnormal liver function was increased alanine aminotransferase (ALT). A total of 5% of the patients had digestive system disease. A total of 3% of the patients had liver disease. The prevalence of nausea and vomiting, diarrhea, abnormal liver function, digestive system disease, and liver disease was higher in Wuhan group. The prevalence of diarrhea was higher in non-China group. Patients in severe/intensive care unit group were more likely to have diarrhea, anorexia, abdominal pain increased aspartate aminotransferase, and increased ALT. The most significant GI symptoms were anorexia and diarrhea. The most significant abnormal liver function was increased ALT. Severe patients were more likely to have GI symptoms and abnormal liver function.

31. **Impact of Corticosteroids in COVID-19 Outcomes: Systematic Review and Meta-Analysis.** Cano EJ, Fuentes XF, Campioli CC, et al. *Chest.* 2020 Oct 28:S0012-3692(20)35107-2. doi: 10.1016/j.chest.2020.10.054. [https://journal.chestnet.org/article/S0012-3692\(20\)35107-2/fulltext](https://journal.chestnet.org/article/S0012-3692(20)35107-2/fulltext)

Findings: A total of 73 studies with 21,350 COVID-19 cases were identified. CS use was widely reported in mechanically ventilated (35.3%), ICU (51.3%) and severe COVID-19 cases (40%). CS showed mortality benefit in severely ill COVID-19 cases, however, no beneficial or harmful

effects were noted amongst high- or low-dose CS regimens. Emerging evidence shows that low-dose CS do not have a significant impact in the duration of SARS-CoV-2 viral shedding. The analysis was limited by highly heterogeneous literature for high- and low-dose CS regimens. Our results show evidence of mortality benefit in severely-ill COVID-19 treated with CS. CS are widely used in COVID-19 cases worldwide and a rapidly developing global pandemic warrants further high-quality clinical trials to define the most beneficial timing and dosing for CS.

32. **Prognostic Impact of Prior Heart Failure in Patients Hospitalized With COVID-19.** Alvarez-Garcia J, Lee S, Gupta A, et al. *J Am Coll Cardiol.* 2020 Oct 26:S0735-1097(20)37242-9. doi: 10.1016/j.jacc.2020.09.549. <https://www.sciencedirect.com/science/article/pii/S0735109720372429>
Findings: Mean age was 63.5 years, and 45% were women. Compared with patients without HF, those with previous HF experienced longer length of stay (8 days vs. 6 days), increased risk of mechanical ventilation (22.8% vs. 11.9%), and mortality (40.0% vs. 24.9%). Outcomes among patients with HF were similar, regardless of LVEF or renin-angiotensin-aldosterone inhibitor use. History of HF was associated with higher risk of mechanical ventilation and mortality among patients hospitalized for COVID-19, regardless of LVEF.
33. **Clinical Characteristics and Outcomes of COVID-19-Infected Cancer Patients: A Systematic Review and Meta-Analysis.** Zhang H, Han H, He T, et al. *J Natl Cancer Inst.* 2020 Nov 2:djaa168. doi: 10.1093/jnci/djaa168. <https://academic.oup.com/jnci/advance-article/doi/10.1093/jnci/djaa168/5951181>
Findings: We included 15 studies with 3019 patients, of which 1628 were men; 41.0% were from the UK and Europe, followed by the USA and Canada (35.7%) and Asia (China, 23.3%). The overall case fatality rate of COVID-19 patients with cancer measured 22.4%. Univariate analysis revealed age, male, and comorbidity were associated with increased risk of severe events. Our analysis demonstrated that COVID-19 patients with cancer have a higher fatality rate when compared with that of COVID-19 patients without cancer. Age and gender appear to be risk factors associated with a poorer prognosis.

Survivorship & Rehabilitation

34. **Follow up of patients with severe coronavirus disease 2019 (COVID-19): Pulmonary and extrapulmonary disease sequelae.** Daher A, Balfanz P, Cornelissen C, et al. *Respir Med.* 2020 Oct 20;174:106197. doi: 10.1016/j.rmed.2020.106197. <https://www.sciencedirect.com/science/article/pii/S0954611120303371>
Findings: 33 patients with severe disease were included. Patients were discharged without prophylactic anticoagulation. At follow-up there were no thromboembolic complications in any patient. 11 patients (33%) had dyspnea, 11 (33%) had cough, and 15 (45%) suffered from symptoms of fatigue. Pulmonary function tests including ABG did not reveal any limitations. There were no echocardiographic impairments. 6MWT distance was reduced in most patients without oxygen desaturation. According to standardized questionnaires, patients suffered from reduced QoL, mainly due to decreased mobility. There were no indicators for depression or anxiety. Hospitalized patients with severe COVID-19, who did not require mechanical

ventilation, are unlikely to develop pulmonary long-term impairments, thromboembolic complications or cardiac impairments after discharge but frequently suffer from symptoms of fatigue.

35. Systematic review and meta-analysis of factors associated with re-positive viral RNA after recovery from COVID-19. Hoang T. *J Med Virol*. 2020 Nov 2. doi: 10.1002/jmv.26648.

<https://onlinelibrary.wiley.com/doi/10.1002/jmv.26648>

Findings: Meta-analysis data were available for age, sex, hospital duration, disease severity, seven comorbidities, five symptoms, five indexes of blood routine, nine indexes of blood biochemistry, four treatment therapies, two antibodies, and history of high-risk contact. Among them, hospital duration of recurrence cases was significantly shorter than nonrecurrence subjects. Fatigue, positive IgM, and positive IgG were associated with an increased risk of recurrence cases. In contrast, the odds of recurrence cases were observed to significantly lower in subjects with elevated lactate dehydrogenase and C-reactive protein, low lymphocyte count, steroid and arbidol use. This study provided up-to-date evidence of several clinical and epidemiological characteristics in the association with COVID-19 recurrence cases. Further in-depth analyses for the causal effect of factors on re-positive viral RNA are needed for the management of discharged patients with COVID-19. This article is protected by copyright. All rights reserved.

Therapeutics

36. SARS-CoV-2 Neutralizing Antibody LY-CoV555 in Outpatients with Covid-19. Chen P, Nirula A, Heller B, et al. *NEJM* Oct 28, 2020. DOI: 10.1056/NEJMoa2029849

<https://www.nejm.org/doi/full/10.1056/NEJMoa2029849?query=TOC>

Findings: In this ongoing phase 2 trial involving outpatients with recently diagnosed mild or moderate Covid-19, we randomly assigned 452 patients to receive a single intravenous infusion of neutralizing antibody LY-CoV555 in one of three doses (700 mg, 2800 mg, or 7000 mg) or placebo and evaluated the quantitative virologic end points and clinical outcomes. The primary outcome was the change from baseline in the viral load at day 11. At the time of the interim analysis, the observed mean decrease from baseline in the log viral load for the entire population was -3.81 , for an elimination of more than 99.97% of viral RNA. For patients who received the 2800-mg dose of LY-CoV555, the difference from placebo in the decrease from baseline was -0.53 , for a viral load that was lower by a factor of 3.4. Smaller differences from placebo in the change from baseline were observed among the patients who received the 700-mg dose or the 7000-mg dose. On days 2 to 6, the patients who received LY-CoV555 had a slightly lower severity of symptoms than those who received placebo. The percentage of patients who had a Covid-19-related hospitalization or visit to an emergency department was 1.6% in the LY-CoV555 group and 6.3% in the placebo group. In this interim analysis of a phase 2 trial, one of three doses of neutralizing antibody LY-CoV555 appeared to accelerate the natural decline in viral load over time.

37. Neither earlier nor late tocilizumab improved outcomes in the intensive care unit patients with COVID-19 in a retrospective cohort study. Moiseev S, Avdeev S, Tao E, et al. *Ann Rheum*

Dis. 2020 Oct 30:annrheumdis-2020-219265. doi: 10.1136/annrheumdis-2020-219265.

<https://ard.bmj.com/content/early/2020/10/30/annrheumdis-2020-219265>

Findings: In summary, neither earlier TCZ administration in non-intubated ICU patients with severe COVID-19 associated pneumonia nor late infusion after initiation of mechanical ventilation did reduce mortality. Unfortunately, our findings are in line with the preliminary results of phase III trials of IL-6 inhibitors in patients with severe COVID-19 pneumonia. Initial immunosuppressive treatment, if considered necessary in these patients, should involve widely available and inexpensive glucocorticoids, whereas IL-6 inhibitors, as chloroquine/hydroxychloroquine, may be preserved for patients with rheumatic diseases in whom these medications have established efficacy.

- 38. Characteristics of Clinical Trials Evaluating Cardiovascular Therapies for Coronavirus Disease 2019 Registered on ClinicalTrials.gov: A Cross Sectional Analysis.** Varshney AS, Wang DE, Bhatt AS, et al. *Am Heart J.* 2020 Oct 26:S0002-8703(20)30351-3. doi: 10.1016/j.ahj.2020.10.065. <https://www.sciencedirect.com/science/article/pii/S0002870320303513>

Findings: A total of 2,935 studies related to COVID-19 were registered as of August 7, 2020. Of these, 1,645 were interventional studies, and the final analytic cohort consisted of 114 studies evaluating 10 CV therapeutic categories. Antithrombotics (32.5%; n=37) were most commonly evaluated, followed by pulmonary vasodilators (14.0%; n=16), renin-angiotensin-aldosterone system-related therapies (12.3%; n=14), and colchicine (8.8%; n=10). Trials evaluating multiple CV therapy categories and CV therapies in combination with non-CV therapies encompassed 4.4% (n=5) and 9.6% (n=11) of studies, respectively. Most studies were designed for randomized allocation (87.7%; n=100), enrollment of less than 1000 participants (86.8%; n=99), single site implementation (55.3%; n=63), and had a primary outcome of mortality or a composite including mortality (56.1%; n=64). Most study populations consisted of patients hospitalized with COVID-19 (81.6%; n=93). At the time of database query, 28.9% (n=33) of studies were not yet recruiting and the majority were estimated to be completed after December 2020 (67.8%; n=78). Most lead sponsors were located in North America (43.9%; n=50) or Europe (36.0%; n=41). A minority (7%) of clinical trials related to COVID-19 registered on ClinicalTrials.gov plan to evaluate CV therapies. Of CV therapy studies, most were planned to be single center, enroll less than 1000 inpatients, sponsored by European or North American academic institutions, and estimated to complete after December 2020. Collectively, these findings underscore the need for a network of sites with a platform protocol for rapid evaluation of multiple therapies and generalizability to inform clinical care and health policy for COVID-19 moving forward.

Transmission / Infection Control

- 39. Peripheral Oxygen Saturation in Older Persons Wearing Nonmedical Face Masks in Community Settings.** Chan NC, Li K, Hirsh J. *JAMA.* October 30, 2020. doi:10.1001/jama.2020.21905

<https://jamanetwork.com/journals/jama/fullarticle/2772655?resultClick=1>

Findings: Fueled by claims on social media that masks can cause hypoxia and are therefore dangerous, concerns have emerged about the safety of wearing face masks. We examined

whether wearing nonmedical face masks was associated with a change in oxygen saturation. 25 participants (mean age, 76.5 years; 12 women [48%]) were enrolled. Nine participants (36%) had at least 1 medical comorbidity. The pooled mean Spo₂ was 96.1% before, 96.5% while, and 96.3% after wearing the mask (Table 2). None of the participants' Spo₂ fell below 92% while wearing masks. In this small crossover study, wearing a 3-layer nonmedical face mask was not associated with a decline in oxygen saturation in older participants.

40. On the effect of age on the transmission of SARS-CoV-2 in households, schools and the community.

Goldstein E, Lipsitch M, Cevik M. *J Infect Dis*. 2020 Oct 29:jiaa691. doi: 10.1093/infdis/jiaa691. <https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiaa691/5943164>

Findings: Compared to younger/middle aged adults, susceptibility to infection for children aged under 10y is estimated to be significantly lower, while estimated susceptibility to infection in adults aged over 60y is higher. Serological studies suggest that younger adults (particularly those aged under 35y) often have high cumulative incidence of SARS-CoV-2 infection in the community. There is some evidence that given limited control measures, SARS-CoV-2 may spread robustly in secondary/high schools, and to a lesser degree in primary schools, with class size possibly affecting that spread. There is also evidence of more limited spread in schools when some mitigation measures are implemented. Several potential biases that may affect these studies are discussed. Mitigation measures should be implemented when opening schools, particularly secondary/high schools. Efforts should be undertaken to diminish mixing in younger adults, particularly individuals aged 18-35y to mitigate the spread of the epidemic in the community.

Vaccine

41. What defines an efficacious COVID-19 vaccine? A review of the challenges assessing the clinical efficacy of vaccines against SARS-CoV-2.

Hodgson SH, Mansatta K, Mallett G, et al. *Lancet Infect Dis*. 2020 Oct 27:S1473-3099(20)30773-8. doi: 10.1016/S1473-3099(20)30773-8. [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(20\)30773-8/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30773-8/fulltext)

An efficacious vaccine is essential to prevent further morbidity and mortality. Although some countries might deploy COVID-19 vaccines on the strength of safety and immunogenicity data alone, the goal of vaccine development is to gain direct evidence of vaccine efficacy in protecting humans against SARS-CoV-2 infection and COVID-19 so that manufacture of efficacious vaccines can be selectively upscaled. A candidate vaccine against SARS-CoV-2 might act against infection, disease, or transmission, and a vaccine capable of reducing any of these elements could contribute to disease control. However, the most important efficacy endpoint, protection against severe disease and death, is difficult to assess in phase 3 clinical trials. In this Review, we explore the challenges in assessing the efficacy of candidate SARS-CoV-2 vaccines, discuss the caveats needed to interpret reported efficacy endpoints, and provide insight into answering the seemingly simple question, "Does this COVID-19 vaccine work?"

Whole Person Care

42. **Person-centered communication between healthcare professionals and COVID-19 infected older adults in acute care settings: Findings from Wuhan, China.** Li J, Wang J, Kong X, et al. *J Gerontol B Psychol Sci Soc Sci.* 2020 Nov 2;gbaa190. doi: 10.1093/geronb/gbaa190.

<https://academic.oup.com/psychsocgerontology/advance-article/doi/10.1093/geronb/gbaa190/5951246>

It is possible and necessary to initiate and sustain person-centered communication despite multiple challenges brought by the pandemic. The achievement of person-centered communication can play significant roles in addressing challenges, building mutual trust, improving quality of care and relationships, and promoting treatment adherence and patients' psychological wellbeing. It is challenging for healthcare professionals to provide care for COVID-19 infected older adults, especially for those with cognitive and sensory impairment, in acute care settings. Facilitating person-centered communication is a significant strategy in responding to the pandemic crisis and a core element of person-centered care.

Women & Children

43. **Fetal Inflammatory Response Syndrome Associated with Maternal SARS-CoV-2 Infection.**

McCarty KL, Tucker M, Lee G. et al. *Pediatrics* October 29, 2020, e2020010132; DOI: <https://doi.org/10.1542/peds.2020-010132>

Findings: Amidst the COVID-19 pandemic, uncertainty exists about the potential for vertical transmission from SARS-CoV-2 infected mothers to the fetus in utero. This case report aims to demonstrate the occurrence of a fetal inflammatory response syndrome associated with maternal SARS-CoV2 infection, resulting in neonatal morbidity. In this case report we present an infant of a SARSCoV-2-positive mother born prematurely with late-onset fever, thrombocytopenia, and elevated inflammatory markers, all of which are consistent with a systemic inflammatory response. The neonate was tested for SARS-CoV-2 by two nasopharyngeal swabs 24 hours apart, both of which were negative. A full work up for additional infectious pathogens was also negative. Although initially in critical condition in the perinatal period, the infant recovered completely prior to discharge. We hypothesize that this systemic inflammation occurred in response to maternal viral infection in the absence of vertical transmission of the virus. During the COVID-19 pandemic, it will be important to consider the virus as a nidus for a fetal inflammatory response syndrome and resulting morbidity, even in the setting of negative SARS-CoV-2 testing in the infant.

44. **Birth and Infant Outcomes Following Laboratory-Confirmed SARS-CoV-2 Infection in Pregnancy — SET-NET, 16 Jurisdictions, March 29–October 14, 2020.** Woodworth KR, Olsen EO, Neelam V, et al. *MMWR Morb Mortal Wkly Rep.* ePub: 2 November 2020. DOI:

<http://dx.doi.org/10.15585/mmwr.mm6944e2>
https://www.cdc.gov/mmwr/volumes/69/wr/mm6944e2.htm?s_cid=mm6944e2_x

Findings: Pregnant women with SARS-CoV-2 infection are at increased risk for severe illness compared with nonpregnant women. Adverse pregnancy outcomes such as preterm birth and pregnancy loss have been reported. Among 3,912 infants with known gestational age born to women with SARS-CoV-2 infection, 12.9% were preterm (<37 weeks), higher than a national

estimate of 10.2%. Among 610 (21.3%) infants with testing results, 2.6% had positive SARS-CoV-2 results, primarily those born to women with infection at delivery.

45. **Update: Characteristics of Symptomatic Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status — United States, January 22–October 3, 2020.** Zambrano LD, Ellington S, Strid P, et al. *MMWR Morb Mortal Wkly Rep.* ePub: 2 November 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6944e3>
Findings: Limited information suggests that pregnant women with COVID-19 might be at increased risk for severe illness compared with nonpregnant women. In an analysis of approximately 400,000 women aged 15–44 years with symptomatic COVID-19, intensive care unit admission, invasive ventilation, extracorporeal membrane oxygenation, and death were more likely in pregnant women than in nonpregnant women. Pregnant women should be counseled about the risk for severe COVID-19–associated illness including death; measures to prevent infection with SARS-CoV-2 should be emphasized for pregnant women and their families.

GUIDELINES & CONSENSUS STATEMENTS

AAP - [Children and COVID-19: State-Level Data Report](#), updated 10-29-20. On October 29, the age distribution of reported COVID-19 cases was provided on the health department websites of 49 states, New York City, the District of Columbia, Puerto Rico, and Guam. While children represented only 11.1% of all cases in states reporting cases by age, over 853,000 children have tested positive for COVID-19 since the onset of the pandemic.

FDA / CDC / NIH / WHO Updates

CDC - [Evidence used to update the list of underlying medical conditions that increase a person’s risk of severe illness from COVID-19](#), updated 11-2-20.

NIH - [COVID-19 Treatment Guidelines](#), updated 11-3-20 w/re: to Remdesivir and corticosteroids.

WHO - [Prevention, identification and management of health worker infection in the context of COVID-19](#). 10-30-20.

Press Releases / Commentary

[Science Denial and COVID Conspiracy Theories: Potential Neurological Mechanisms and Possible Responses](#). *JAMA*. November 2, 2020. doi:10.1001/jama.2020.21332

[FDA Approves Providence Cancer Institute COVID-19 Vaccine Trial](#), Oct 29, 2020. The U.S. FDA gave Providence Cancer Institute researchers approval to begin a first-in-human clinical trial of a vaccine for protection against COVID-19. The Providence vaccine is unique in that it incorporates immunotherapy expertise scientists have developed throughout three decades of cancer research at the Earle A. Chiles

Research Institute. The trial will enroll 36 volunteers in the initial phase, and researchers are working to open the study without delay. This COVID vaccine is one of 18 in clinical trials in the U.S.

[REGENERON'S COVID-19 OUTPATIENT TRIAL PROSPECTIVELY DEMONSTRATES THAT REGN-COV2 ANTIBODY COCKTAIL SIGNIFICANTLY REDUCED VIRUS LEVELS AND NEED FOR FURTHER MEDICAL ATTENTION](#) - October 28, 2020

[REGN-COV2 INDEPENDENT DATA MONITORING COMMITTEE RECOMMENDS HOLDING ENROLLMENT IN HOSPITALIZED PATIENTS WITH HIGH OXYGEN REQUIREMENTS AND CONTINUING ENROLLMENT IN PATIENTS WITH LOW OR NO OXYGEN REQUIREMENTS](#) – October 30, 2020

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