

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. **In vivo monoclonal antibody efficacy against SARS-CoV-2 variant strains.** Chen RE, et al. *Nature*. 2021 Jun 21. doi: 10.1038/s41586-021-03720-y.
https://www.nature.com/articles/s41586-021-03720-y_reference.pdf
Using a panel of monoclonal antibodies (mAbs) corresponding to many in advanced clinical development by pharma companies, we report the impact on protection in animals against authentic SARS-CoV-2 variants including viruses with B.1.1.7, B.1.351, or B.1.1.28 spike genes. Prophylactic doses of mAb combinations protected against infection by many variants in K18-hACE2 transgenic mice, 129S2 immunocompetent mice, and hamsters without emergence of resistance. When administered after infection as therapy, higher doses of several mAb cocktails protected in vivo against viruses with a B.1.351 spike gene. Thus, many, but not all, of the antibody products with Emergency Use Authorization should retain substantial efficacy against the prevailing SARS-CoV-2 variant strains.
2. **Protective efficacy of Ad26.COVS.2 against SARS-CoV-2 B.1.351 in macaques.** Yu J, et al. *Nature*. 2021 Jun 23. doi: 10.1038/s41586-021-03732-8.
<https://www.nature.com/articles/s41586-021-03732-8>
Data demonstrate that Ad26.COVS.2 provided robust protection against B.1.351 challenge in rhesus macaques. Our findings have important implications for vaccine control of SARS-CoV-2 variants of concern.

Diagnostics & Screening

3. **Multiplex Real-Time Reverse Transcription PCR for Influenza A Virus, Influenza B Virus, and Severe Acute Respiratory Syndrome Coronavirus 2.** Shu B, et al. *Emerg Infect Dis*. 2021;27(7):1821-1830. doi: 10.3201/eid2707.210462.
<https://wwwnc.cdc.gov/eid/article/27/7/pdfs/21-0462.pdf>
Flu SC2 Multiplex Assay demonstrates a high level of specificity and sensitivity. In a single reaction, it can detect and distinguish 3 major respiratory viruses as well as the human quality control target, thereby increasing the testing throughput. Additional advantages of the Flu SC2 Multiplex Assay include fewer freeze-thaw cycles, decreased potential for contamination

through a reduction in the number of reactions, and fewer opportunities for pipetting errors. With this multiplex assay, users can rapidly test large amounts of samples. Although the influenza season for 2020–21 had historically few cases, this assay will be beneficial in upcoming influenza seasons when influenza might co-circulate with SARS-CoV-2.

Epidemiology & Public Health

4. **Association of the COVID-19 Pandemic with Estimated Life Expectancy by Race/Ethnicity in the United States, 2020.** Andrasfay T, et al. *JAMA Netw Open.* 2021 Jun 1;4(6):e2114520. doi: 10.1001/jamanetworkopen.2021.14520.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2781320>

The findings of this cross-sectional study suggest that COVID-19 is associated with continued reductions in life expectancy in 2021 compared with pre-pandemic levels. COVID-19 deaths through early April 2021 already indicate an almost 0.6-year reduction in overall 2021 US life expectancy with continued disproportionate changes for the Black and Latino populations.

5. **Association of Mask Mandates and COVID-19 Case Rates, Hospitalizations, and Deaths in Kansas.** Ginther DK, et al. *JAMA Netw Open.* 2021;4(6):e2114514. doi:10.1001/jamanetworkopen.2021.14514

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2781283>

Counties that adopted the July mask mandate in Kansas experienced significantly lower rates of COVID-19 cases, hospitalizations, and deaths compared with those that did not. These findings corroborate previous studies that found that mask mandates slowed the growth of COVID-19 cases in Kansas counties and reduced the spread in states. Our results comparing mask-only policies with masks plus additional restrictions suggest that mask-wearing is associated with these reductions.

Healthcare Delivery & Healthcare Workers

6. **Changes in Physician Work Hours and Patterns during the COVID-19 Pandemic.** Hu X, et al. *JAMA Netw Open.* 2021;4(6):e2114386. doi:10.1001/jamanetworkopen.2021.14386

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2781284>

This study found that physicians' work hours have significantly decreased since the start of the COVID-19 pandemic in the US, accelerating an existing, gradual decline. There was also a decreased percentage of physicians working full-time, a rise in the percentage who were laid off, and increased changes in physicians' usual activities. These observed changes may reflect the decrease in health care utilization and the increased flexibilities instigated by COVID-19–driven regulations. The decline in the percentage of parents with preschool-aged children among only female physicians may suggest a disproportionate uptake of childcare responsibilities among female physicians.

7. **SARS-CoV-2 Positivity and Mask Utilization among Health Care Workers.** Li A, et al. *JAMA Netw Open.* 2021;4(6):e2114325. doi:10.1001/jamanetworkopen.2021.14325

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2781219>

Our study found no association in positivity rates among HCW wearing respirator masks vs medical masks when performing nonaerosolizing, routine patient care, supporting findings from a recent case-control study and an earlier case report suggesting that MM protected HCWs from acquiring COVID-19. Only 4 positive tests followed exposure events, none were from confirmed AEs, and all occurred prior to universal masking implementation. More than 95% of HCWs acquired COVID-19 outside of a known patient-related exposure event, possibly due to improper donning and doffing of masks during social interactions with other HCWs in the workplace or in the community, supporting a study finding higher risk of COVID-19 transmission outside of patient care interactions.

Prognosis

8. **COVID-19 in immunocompromised populations: implications for prognosis and repurposing of immunotherapies.** Goldman JD, et al [Providence author]. *J Immunother Cancer*. 2021 Jun;9(6):e002630. doi: 10.1136/jitc-2021-002630.
<https://jitc.bmj.com/content/jitc/9/6/e002630.full.pdf>
Findings from observational studies of chronically immunosuppressed populations provide fundamental insights into the effects of iatrogenic immunosuppression and whether these therapies could be repurposed for treatment of COVID-19. Anticytokine and other immunomodulatory therapies given for other purposes may have beneficial, harmful, or no effects on COVID-19 disease progression.
9. **Mortality and critical care unit admission associated with the SARS-CoV-2 lineage B.1.1.7 in England: an observational cohort study.** Patone M, et al. *Lancet*. June 22,2021
DOI:[https://doi.org/10.1016/S1473-3099\(21\)00318-2](https://doi.org/10.1016/S1473-3099(21)00318-2)
[https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(21\)00318-2/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00318-2/fulltext)
Patients with lineage B.1.1.7 were at increased risk of CCU admission and 28-day mortality compared with patients with non-B.1.1.7 SARS-CoV-2. For patients receiving critical care, mortality appeared to be independent of virus strain. Our findings emphasise the importance of measures to control exposure to and infection with COVID-19.
10. **Risk of hospitalisation associated with infection with SARS-CoV-2 lineage B.1.1.7 in Denmark: an observational cohort study.** Bager P, et al. *Lancet*. June 22, 2021
DOI:[https://doi.org/10.1016/S1473-3099\(21\)00290-5](https://doi.org/10.1016/S1473-3099(21)00290-5)
[https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(21\)00290-5/fulltext#%20](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00290-5/fulltext#%20)
Infection with SARS-CoV-2 lineage B.1.1.7 was associated with an increased risk of hospitalisation compared with that of other lineages in an analysis adjusted for covariates. The overall effect on hospitalisations in Denmark was lessened due to a strict lockdown, but our findings could support hospital preparedness and modelling of the projected impact of the epidemic in countries with uncontrolled spread of B.1.1.7.

Survivorship & Rehabilitation

11. **Clinical Outcomes for Patients with Anosmia 1 Year after COVID-19 Diagnosis.** Renaud M, et al. *JAMA Netw Open.* 2021;4(6):e2115352. doi:10.1001/jamanetworkopen.2021.15352 <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2781319>

We describe the long-term prognosis for a cohort of patients with COVID-19–related anosmia, most of whom (96.1%) objectively recovered by 12 months. Our findings suggest that an additional 10% gain in recovery can be expected at 12 months, compared with studies with 6 months of follow-up that found only 85.9% of patients with recovery. This supports findings from fundamental animal research, involving both imaging studies and postmortem pathology, suggesting that COVID-19–related anosmia is likely due to peripheral inflammation.

Therapeutics

12. **Neutralizing Monoclonal Antibody Treatment Reduces Hospitalization for Mild and Moderate COVID-19: A Real-World Experience.** Verderese JP, et al. *Clinical Infectious Diseases,* June 24, 2021. <https://doi.org/10.1093/cid/ciab579>

707 confirmed COVID-19 patients received NmAb and 1709 historic COVID-19 controls were included. Patients receiving NmAb infusion had significantly lower hospitalization rate, a shorter length of stay if hospitalized, and fewer ED visits within 30 days post-index than controls. NmAb treatment reduced hospital utilization especially when received within a few days of symptom onset. Further study is needed to validate these findings.

13. **Imatinib in patients with severe COVID-19: a randomised, double-blind, placebo-controlled, clinical trial.** Aman J, et al. *Lancet Respir Med.* 2021 Jun 17:S2213-2600(21)00237-X. doi: 10.1016/S2213-2600(21)00237-X. <http://www.thelancet.com/article/S221326002100237X/pdf>

The study failed to meet its primary outcome, as imatinib did not reduce the time to discontinuation of ventilation and supplemental oxygen for more than 48 consecutive hours in patients with COVID-19 requiring supplemental oxygen. The observed effects on survival (although attenuated after adjustment for baseline imbalances) and duration of mechanical ventilation suggest that imatinib might confer clinical benefit in hospitalised patients with COVID-19, but further studies are required to validate these findings.

14. **Ivermectin for Prevention and Treatment of COVID-19 Infection: A Systematic Review, Meta-analysis, and Trial Sequential Analysis to Inform Clinical Guidelines.** Bryant A, et al. *Am J Ther.* 2021 Jun 17. doi: 10.1097/MJT.0000000000001402.

https://journals.lww.com/americantherapeutics/Abstract/9000/Ivermectin_for_Prevention_and_Treatment_of.98040.aspx

Meta-analysis of 15 trials found that ivermectin reduced risk of death compared with no ivermectin. Moderate-certainty evidence finds that large reductions in COVID-19 deaths are possible using ivermectin. Using ivermectin early in the clinical course may reduce numbers progressing to severe disease. The apparent safety and low cost suggest that ivermectin is likely to have a significant impact on the SARS-CoV-2 pandemic globally.

Transmission / Infection Control

15. **Variants of concern are overrepresented among post-vaccination breakthrough infections of SARS-CoV-2 in Washington State.** McEwen AE, et al. *Clin Infect Dis*. 2021 Jun 24:ciab581. doi: 10.1093/cid/ciab581. <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab581/6309019>

Across 20 vaccine breakthrough cases detected at University of WA, all 20 (100%) infections were due to variants of concern (VOC) and had a median Ct of 20.2 (IQR=17.1-23.3). When compared to 5174 contemporaneous samples sequenced in our laboratory, VOC were significantly enriched among breakthrough infections ($p < .05$).

Vaccines / Immunology

16. **COVID-19 Vaccination Coverage and Intent among Adults Aged 18-39 Years - United States, March-May 2021.** Baack BN, et al. *MMWR Morb Mortal Wkly Rep*. 2021 Jun 25;70(25):928-933. doi: 10.15585/mmwr.mm7025e2.

https://www.cdc.gov/mmwr/volumes/70/wr/mm7025e2.htm?s_cid=mm7025e2_w

CDC conducted nationally representative household panel surveys during March-May 2021. Among respondents aged 18-39 years, 34.0% reported having received a COVID-19 vaccine. A total of 51.8% were already vaccinated or definitely planned to get vaccinated, 23.2% reported that they probably were going to get vaccinated or were unsure about getting vaccinated, and 24.9% reported that they probably or definitely would not get vaccinated. Adults aged 18-24 years were least likely to report having received a COVID-19 vaccine and were most likely to report being unsure about getting vaccinated or that they were probably going to get vaccinated. Adults aged 18-39 years with lower incomes, with lower educational attainment, without health insurance, who were non-Hispanic Black, and who lived outside of metropolitan areas had the lowest reported vaccination coverage and intent to get vaccinated. Concerns about vaccine safety and effectiveness were the primary reported reasons for not getting vaccinated. Vaccination intent and acceptance among adults aged 18-39 years might be increased by improving confidence in vaccine safety and efficacy while emphasizing that vaccines are critical to prevent the spread of COVID-19 to friends and family and for resuming social activities.

17. **Guillain-Barré Syndrome following ChAdOx1-S/nCoV-19 Vaccine.** Maramattom BV, et al. *Ann Neurol*. 2021 Jun 10. doi: 10.1002/ana.26143. <https://onlinelibrary.wiley.com/doi/10.1002/ana.26143>

We observed seven cases of Guillain-Barre syndrome (GBS) that occurred within 2 weeks of the first dose of vaccination. All seven patients developed severe GBS. The frequency of GBS was 1.4- to 10-fold higher than that expected in this period for a population of this magnitude. In addition, the frequency of bilateral facial weakness, which typically occurs in <20% of GBS cases, suggests a pattern associated with the vaccination. While the benefits of vaccination substantially outweigh the risk of this relatively rare outcome (5.8 per million), clinicians should be alert to this possible adverse event, as six out of seven patients progressed to areflexic quadriplegia and required mechanical ventilatory support.

18. **Anti-GBM nephritis with mesangial IgA deposits after SARS-CoV-2 mRNA vaccination.** Sacker A, et al [Providence author]. *Kidney Int.* 2021 Jun 10:S0085-2538(21)00586-X. doi: 10.1016/j.kint.2021.06.006. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8191282/>
We would like to report another case of anti-GBM disease, which had coexistent mesangial IgA deposits. The patient is an older woman with previously normal renal function and no significant past medical history, prior COVID-19 infection, or medication use, who developed fevers, anorexia, nausea, and gross hematuria 2 weeks after receiving the second dose of Moderna SARS-CoV-2 vaccine. Symptoms lasted 2 weeks, and she presented with acute kidney injury. She was treated with methylprednisolone, Cytoxan, plasmapheresis, and hemodialysis, and she remains dialysis-dependent.
19. **Three Doses of an mRNA Covid-19 Vaccine in Solid-Organ Transplant Recipients.** Kamar N, et al. *N Engl J Med.* 2021 Jun 23. doi: 10.1056/NEJMc2108861. https://www.nejm.org/doi/10.1056/NEJMc2108861?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%20pubmed
This study showed that administration of a third dose of the BNT162b2 vaccine to solid-organ transplant recipients significantly improved the immunogenicity of the vaccine, with no cases of Covid-19 reported in any of the patients. However, a large proportion of the patients remain at risk for Covid-19. Barrier measures should be maintained, and vaccination of the relatives of these patients should be encouraged.
20. **SARS-CoV-2 Variants and Vaccines.** Krause PR, et al. *N Engl J Med.* 2021 Jun 23. doi: 10.1056/NEJMs2105280. <https://doi.org/10.1056/nejmsr2105280>
There are four major priorities for the global response to variants of concern (Table 1). These priorities, which involve scientific approaches for evaluating existing vaccines and developing modified and new vaccines, are to determine whether existing vaccines are losing efficacy against variants, to decide whether modified or new vaccines are warranted to restore efficacy against variants, to reduce the likelihood that variants of concern will emerge, and to coordinate international research and the response to new variants, both in general and in relation to vaccines, through the World Health Organization (WHO).

Women & Children

21. **Mild SARS-CoV-2 Infections and Neutralizing Antibody Titers.** Bonfante F, et al. *Pediatrics.* 2021 Jun 22:e2021052173. doi: 10.1542/peds.2021-052173. <https://pediatrics.aappublications.org/content/early/2021/06/18/peds.2021-052173.long>
Younger children develop higher levels of neutralizing antibodies during the first 7-8 months after asymptomatic/mild symptomatic COVID-19, compared to older siblings/adults. The long-lasting levels of nAbs may lead to durable protection and higher viral clearance, reducing shedding and transmission.

GUIDELINES & CONSENSUS STATEMENTS

[Cardiac surgeons' concerns, perceptions, and responses during the COVID-19 pandemic.](#)

COVID-19 North American Cardiac Surgery Survey Working Group Collaborators, Lehr EJ, et al [Providence author]. *J Card Surg.* 2021 Jun 12. doi: 10.1111/jocs.15681.

[Taskforce report on the diagnosis and clinical management of COVID-19 associated pulmonary aspergillosis.](#)

Intensive Care Med. 2021 Jun 23:1-16. doi: 10.1007/s00134-021-06449-4.

[The Infectious Diseases Society of America Guidelines on the Diagnosis of COVID-19: Antigen Testing.](#)

Clin Infect Dis. 2021 Jun 23:ciab557. doi: 10.1093/cid/ciab557.

FDA / CDC / NIH / WHO Updates

CDC - [Myocarditis and Pericarditis Following mRNA COVID-19 Vaccination](#), updated June 23, 2021

CDC - [Statement Following CDC ACIP Meeting from Nation's Leading Doctors, Nurses and Public Health Leaders on Benefits of Vaccination](#), June 23, 2021

"The facts are clear: this is an extremely rare side effect, and only an exceedingly small number of people will experience it after vaccination. Importantly, for the young people who do, most cases are mild, and individuals recover often on their own or with minimal treatment. In addition, we know that myocarditis and pericarditis are much more common if you get COVID-19, and the risks from COVID-19 infection can be more severe."

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