

## 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](#)**

### Clinical Syndrome

1. **Disorders of Consciousness Associated With COVID-19: A Prospective, Multimodal Study of Recovery and Brain Connectivity.** Fischer D et al. *Neurology*. 2021 Dec 3;10.1212/WNL.0000000000013067. doi: 10.1212/WNL.0000000000013067. <https://n.neurology.org/content/early/2021/12/02/WNL.0000000000013067>  
Patients who survived invariably recovered consciousness after COVID-DoC. Though disability was common following hospitalization, functional status improved over the ensuing months. While future research is necessary, these prospective findings inform the prognosis and pathophysiology of COVID-DoC.

### Epidemiology & Public Health

2. **Effectiveness of public health measures in reducing the incidence of covid-19, SARS-CoV-2 transmission, and covid-19 mortality: systematic review and meta-analysis.** *BMJ*. 2021 Dec 3;375:n2997. doi: 10.1136/bmj.n2997. <https://www.bmj.com/content/375/bmj-2021-068302>  
This systematic review and meta-analysis suggests that several personal protective and social measures, including handwashing, mask wearing, and physical distancing are associated with reductions in the incidence covid-19. Public health efforts to implement public health measures should consider community health and sociocultural needs, and future research is needed to better understand the effectiveness of public health measures in the context of covid-19 vaccination.
3. **Probable Transmission of SARS-CoV-2 Omicron Variant in Quarantine Hotel, Hong Kong, China, November 2021.** Gu H et al. *Emerg Infect Dis*. 2021 Dec 3;28(2). doi: 10.3201/eid2802.212422. [https://wwwnc.cdc.gov/eid/article/28/2/21-2422\\_article](https://wwwnc.cdc.gov/eid/article/28/2/21-2422_article)  
We report detection of severe acute respiratory syndrome coronavirus 2 Omicron variant (B.1.1.529) in an asymptomatic, fully vaccinated traveler in a quarantine hotel in Hong Kong, China. The Omicron variant was also detected in a fully vaccinated traveler staying in a room across the corridor from the index patient, suggesting transmission despite strict quarantine precautions.

4. **Intention to Vaccinate Children against COVID-19 Among Vaccinated and Unvaccinated US Parents.** Rane MS, et al. *JAMA Pediatr.* 2021 Dec 6. doi:10.1001/jamapediatrics.2021.5153. <https://jamanetwork.com/journals/jamapediatrics/fullarticle/2786341>  
In September 2021, one-fourth of the COVID-19 cases in the US were among children.<sup>1</sup> Vaccinating children against COVID-19 is the most effective way to reduce disease burden and ensure safe return to in-person schooling and other social activities. National surveys show hesitancy among parents to vaccinate children,<sup>2,3</sup> even when they are vaccinated themselves.<sup>4</sup> We measured parental intention to vaccinate children and related sociodemographic factors in a national sample of US parents.

### Healthcare Delivery & Healthcare Workers

5. **Nursing Home Staff Vaccination and Covid-19 Outcomes.** McGarry BE, et al. *N Engl J Med.* 2021 Dec 8. doi: 10.1056/NEJMc2115674. <https://www.nejm.org/doi/full/10.1056/NEJMc2115674>  
Nursing home staff are considered to be a source of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in nursing homes.<sup>1,2</sup> The emergence of the B.1.617.2 (delta) variant has heightened concerns about coronavirus disease 2019 (Covid-19)–related illness and death in nursing homes, especially given the low vaccination rates among the staff at many facilities.<sup>3</sup> These concerns prompted the federal government to mandate that staff at nursing homes be vaccinated.<sup>4</sup> However, the potential effect of staff vaccination rates on Covid-19 in nursing homes has not been well studied.
6. **Trends in US Surgical Procedures and Health Care System Response to Policies Curtailing Elective Surgical Operations during the COVID-19 Pandemic.** Mattingly AS et al. *JAMA Netw Open.* 2021 Dec 1;4(12):e2138038. doi: 10.1001/jamanetworkopen.2021.38038. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2786935>  
This study found that the initial shutdown period in March through April 2020, was associated with a decrease in surgical procedure volume to nearly half of baseline rates. After the reopening, the rate of surgical procedures rebounded to 2019 levels, and this trend was maintained throughout the peak burden of patients with COVID-19 in fall and winter; these findings suggest that after initial adaptation, health systems appeared to be able to self-regulate and function at prepandemic capacity.

### Therapeutics

7. **Lenzilumab in hospitalised patients with COVID-19 pneumonia (LIVE-AIR): a phase 3, randomised, placebo-controlled trial.** Temesgen Z et al. *Lancet Respir Med.* 2021 Dec 1:S2213-2600(21)00494-X. doi: 10.1016/S2213-2600(21)00494-X. [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(21\)00494-X/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(21)00494-X/fulltext)  
INTERPRETATION: Lenzilumab significantly improved survival without invasive mechanical ventilation in hospitalised patients with COVID-19, with a safety profile similar to that of

placebo. The added value of lenzilumab beyond other immunomodulators used to treat COVID-19 alongside steroids remains unknown.

8. **Effect of High-Flow Oxygen Therapy vs Conventional Oxygen Therapy on Invasive Mechanical Ventilation and Clinical Recovery in Patients with Severe COVID-19: A Randomized Clinical Trial.** Ospina-Tascón GA et al. *JAMA*. 2021 Dec 7;326(21):2161-2171. doi: 10.1001/jama.2021.20714. <https://jamanetwork.com/journals/jama/fullarticle/2786830>  
CONCLUSIONS AND RELEVANCE: Among patients with severe COVID-19, use of high-flow oxygen through a nasal cannula significantly decreased need for mechanical ventilation support and time to clinical recovery compared with conventional low-flow oxygen therapy.
9. **Benefits and risks of noninvasive oxygenation strategy in COVID-19: a multicenter, prospective cohort study (COVID-ICU) in 137 hospitals.** COVID-ICU group, for the REVA network, COVID-ICU investigators. *Crit Care*. 2021 Dec 8;25(1):421. doi: 10.1186/s13054-021-03784-2. <https://ccforum.biomedcentral.com/articles/10.1186/s13054-021-03784-2>  
In patients with COVID-19, HFNC was associated with a reduction in oxygenation failure without improvement in 90-day mortality, whereas NIV was associated with a higher mortality in these patients. Randomized controlled trials are needed.

### Vaccines / Immunology

10. **Poor antibody response to BioNTech/Pfizer COVID-19 vaccination in SARS-CoV-2 naïve residents of nursing homes.** Pannus P et al. *Clin Infect Dis*. 2021 Dec 3:ciab998. doi: 10.1093/cid/ciab998. <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab998/6448839>  
RESULTS: SARS-CoV-2 naïve residents had lower Ab responses to BNT162b2 mRNA vaccination than naïve staff. These poor responses involved lower levels of IgG to all spike domains, lower avidity of RBD IgG, and lower levels of Ab neutralizing the vaccine strain. No naïve resident had detectable neutralizing Ab to the B.1.351 variant. In contrast, SARS-CoV-2 infected residents had high responses to mRNA vaccination, with Ab levels comparable to infected staff. Cluster analysis revealed that poor vaccine responders not only included naïve residents but also naïve staff, emphasizing the heterogeneity of responses to mRNA vaccination in the general population. The poor Ab responses to mRNA vaccination observed in infection naïve residents and in some naïve staff members of NH suggest suboptimal protection against breakthrough infection, especially with variants of concern. These data support the administration of a third dose of mRNA vaccine to further improve protection of NH residents against COVID-19.
11. **Duration of SARS-CoV-2 Natural Immunity and Protection against the Delta Variant: A Retrospective Cohort Study.** Kim P, et al. *Clin Infect Dis*. 2021 Dec 3:ciab999. doi: 10.1093/cid/ciab999. <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab999/6448857>  
SARS-CoV-2 infection is highly protective against reinfection with the Delta variant. Immunity from prior infection lasts for at least 13 months. Countries facing vaccine shortages should consider delaying vaccinations for previously infected patients to increase access.

- 12. Safety and immunogenicity of seven COVID-19 vaccines as a third dose (booster) following two doses of ChAdOx1 nCov-19 or BNT162b2 in the UK (COV-BOOST): a blinded, multicentre, randomised, controlled, phase 2 trial.** Munro APS et al. *Lancet*. 2021 Dec 2:S0140-6736(21)02717-3. doi: 10.1016/S0140-6736(21)02717-3.  
[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)02717-3/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02717-3/fulltext)  
All study vaccines boosted antibody and neutralising responses after ChAd/ChAd initial course and all except one after BNT/BNT, with no safety concerns. Substantial differences in humoral and cellular responses, and vaccine availability will influence policy choices for booster vaccination.
- 13. Immunogenicity of Extended mRNA SARS-CoV-2 Vaccine Dosing Intervals.** Grunau B et al. *JAMA*. 2021 Dec 3. doi: 10.1001/jama.2021.21921.  
<https://jamanetwork.com/journals/jama/fullarticle/2786992>  
Standard dosing intervals for BNT162b2 and mRNA-1273 SARS-CoV-2 vaccines are 21 and 28 days, respectively. Data suggest improved effectiveness of ChAdOx1 adenoviral and other nonreplicating vaccines with increased dosing intervals, but little data exist for mRNA vaccines. This study investigated the immunogenicity of extended mRNA vaccine dosing intervals.
- 14. Robust immune responses are observed after one dose of BNT162b2 mRNA vaccine dose in SARS-CoV-2 experienced individuals.** Samanovic MI et al. *Sci Transl Med* 2021 Dec 7. DOI: 10.1126/scitranslmed.abi8961 <https://www.science.org/doi/10.1126/scitranslmed.abi8961>  
The use of COVID-19 vaccines will play the major role in helping to end the pandemic that has killed millions worldwide. COVID-19 vaccines have resulted in robust humoral responses and protective efficacy in human trials, but efficacy trials excluded individuals with a prior diagnosis of COVID-19. As a result, little is known about how immune responses induced by mRNA vaccines differ in individuals who recovered from COVID-19. Here, we evaluated longitudinal immune responses to two-dose BNT162b2 mRNA vaccination in 15 adults who had experienced COVID-19, compared to 21 adults who did not have prior COVID-19. Consistent with prior studies of mRNA vaccines, we observed robust cytotoxic CD8+ T cell responses in both cohorts following the second dose. Furthermore, SARS-CoV-2-naïve individuals had progressive increases in humoral and antigen-specific antibody-secreting cell (ASC) responses following each dose of vaccine, whereas SARS-CoV-2-experienced individuals demonstrated strong humoral and antigen-specific ASC responses to the first dose but these responses were not further enhanced after the second dose of the vaccine at the time points studied. Together, these data highlight the relevance of immunological history for understanding vaccine immune responses and may have implications for personalizing mRNA vaccination regimens used to prevent COVID-19, including for the deployment of booster shots.
- 15. SARS-CoV-2 Omicron has extensive but incomplete escape of Pfizer BNT162b2 elicited neutralization and requires ACE2 for infection.** Cele S et al. *MedRxiv* 2021 Dec 7. Preprint <https://www.ahri.org/wp-content/uploads/2021/12/MEDRXIV-2021-267417v1-Sigal.pdf>  
Here we investigated whether Omicron escapes antibody neutralization elicited by the Pfizer BNT162b2 mRNA vaccine and whether the virus still requires binding to the ACE2 receptor to

infect cells. We used an early passage of isolated and sequence confirmed live Omicron virus isolated in South Africa. We used a human lung cell line clone (H1299-ACE2) engineered to express the ACE2 receptor to both isolate the virus and test neutralization. We also tested growth in the parental H1299 which do not overexpress ACE2 and are not appreciably infectable with SARS-CoV-2. The H1299-ACE2 cells were similar to Vero-E6 in titer dependent focus formation, but were considerably more sensitive.

16. **BNT162b2 Vaccine Booster and Mortality Due to Covid-19.** Arbel R, et al. *N Engl J Med.* 2021 Dec 8. doi: 10.1056/NEJMoa2115624.

<https://www.nejm.org/doi/full/10.1056/NEJMoa2115624>

RESULTS: A total of 843,208 participants met the eligibility criteria, of whom 758,118 (90%) received the booster during the 54-day study period. Death due to Covid-19 occurred in 65 participants in the booster group (0.16 per 100,000 persons per day) and in 137 participants in the nonbooster group (2.98 per 100,000 persons per day). The adjusted hazard ratio for death due to Covid-19 in the booster group, as compared with the nonbooster group, was 0.10 (95% confidence interval, 0.07 to 0.14;  $P < 0.001$ ). Participants who received a booster at least 5 months after a second dose of BNT162b2 had 90% lower mortality due to Covid-19 than participants who did not receive a booster.

17. **Protection against Covid-19 by BNT162b2 Booster across Age Groups.** Bar-On YM et al. *N Engl J Med.* 2021 Dec 8. doi: 10.1056/NEJMoa2115926. Online ahead of print.

<https://www.nejm.org/doi/full/10.1056/NEJMoa2115926>

CONCLUSIONS: Across the age groups studied, rates of confirmed Covid-19 and severe illness were substantially lower among participants who received a booster dose of the BNT162b2 vaccine than among those who did not.

18. **Comparative Effectiveness of Coronavirus Vaccine in Preventing Breakthrough Infections among Vaccinated Persons Infected with Delta and Alpha Variants.** PT-COVID-19 Group2. *Emerg Infect Dis.* 2021 Dec 8;28(2). doi: 10.3201/eid2802.211789.

[https://wwwnc.cdc.gov/eid/article/28/2/21-1789\\_article](https://wwwnc.cdc.gov/eid/article/28/2/21-1789_article)

We developed a case-case study to compare mRNA vaccine effectiveness against Delta versus Alpha coronavirus variants. We used data on 2,097 case-patients with PCR-positive severe acute respiratory syndrome coronavirus 2 infections reported in Portugal during May-July 2021. We estimated the odds of vaccine breakthrough infection in Delta-infected versus Alpha-infected patients by using conditional logistic regression adjusted for age group and sex and matched by the week of diagnosis. We compared reverse-transcription PCR cycle threshold values by vaccination status and variant as an indirect measure of viral load. We found significantly higher odds of vaccine breakthrough infection in Delta-infected patients than in Alpha-infected patients (odds ratio 1.96 [95% CI 1.22-3.14]), suggesting lower effectiveness of the mRNA vaccines in preventing infection with the Delta variant. We estimated lower mean

cycle threshold values for the Delta cases (mean difference -2.10 [95% CI -2.74 to -1.47]), suggesting higher infectiousness than the Alpha variant.

19. **Immunogenicity, safety, and reactogenicity of heterologous COVID-19 primary vaccination incorporating mRNA, viral-vector, and protein-adjuvant vaccines in the UK (Com-COV2): a single-blind, randomised, phase 2, non-inferiority trial.** Stuart ASV et al. *Lancet*. 2021 Dec 6:S0140-6736(21)02718-5. doi: 10.1016/S0140-6736(21)02718-5.

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)02718-5/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02718-5/fulltext)

INTERPRETATION: Heterologous second dosing with m1273, but not NVX, increased transient systemic reactogenicity compared with homologous schedules. Multiple vaccines are appropriate to complete primary immunisation following priming with BNT or ChAd, facilitating rapid vaccine deployment globally and supporting recognition of such schedules for vaccine certification.

20. **Comparative Effectiveness and Antibody Responses to Moderna and Pfizer-BioNTech COVID-19 Vaccines among Hospitalized Veterans - Five Veterans Affairs Medical Centers, United States, February 1-September 30, 2021.** Bajema KL et al. *MMWR Morb Mortal Wkly Rep*. 2021 Dec 10;70(49):1700-1705. doi: 10.15585/mmwr.mm7049a2.

[https://www.cdc.gov/mmwr/volumes/70/wr/mm7049a2.htm?s\\_cid=mm7049a2\\_w](https://www.cdc.gov/mmwr/volumes/70/wr/mm7049a2.htm?s_cid=mm7049a2_w)

The mRNA COVID-19 vaccines (Moderna and Pfizer-BioNTech) provide strong protection against severe COVID-19, including hospitalization, for at least several months after receipt of the second dose (1,2). However, studies examining immune responses and differences in protection against COVID-19-associated hospitalization in real-world settings, including by vaccine product, are limited. To understand how vaccine effectiveness (VE) might change with time, CDC and collaborators assessed the comparative effectiveness of Moderna and Pfizer-BioNTech vaccines in preventing COVID-19-associated hospitalization at two periods (14-119 days and  $\geq 120$  days) after receipt of the second vaccine dose among 1,896 U.S. veterans at five Veterans Affairs medical centers (VAMCs) during February 1-September 30, 2021. Among 234 U.S. veterans fully vaccinated with an mRNA COVID-19 vaccine and without evidence of current or prior SARS-CoV-2 infection, serum antibody levels (anti-spike immunoglobulin G [IgG] and anti-receptor binding domain [RBD] IgG) to SARS-CoV-2 were also compared. Adjusted VE 14-119 days following second Moderna vaccine dose was 89.6% (95% CI = 80.1%-94.5%) and after the second Pfizer-BioNTech dose was 86.0% (95% CI = 77.6%-91.3%); at  $\geq 120$  days VE was 86.1% (95% CI = 77.7%-91.3%) for Moderna and 75.1% (95% CI = 64.6%-82.4%) for Pfizer-BioNTech. Antibody levels were significantly higher among Moderna recipients than Pfizer-BioNTech recipients across all age groups and periods since vaccination; however, antibody levels among recipients of both products declined between 14-119 days and  $\geq 120$  days. These findings from a cohort of older, hospitalized veterans with high prevalences of underlying conditions suggest the importance of booster doses to help maintain long-term protection against severe COVID-19.†.

## Women & Children

### 21. **Multisystem Inflammatory Syndrome in Children-United States, February 2020-July 2021.**

Miller AD et al. *Clin Infect Dis*. 2021 Dec 5:ciab1007. doi: 10.1093/cid/ciab1007.

<https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab1007/6453395>

Over the first 3 pandemic waves of MIS-C in the United States, cardiovascular complications and clinical outcomes including length of hospitalization, receipt of ECMO, and death decreased over time. These data serve as a baseline for monitoring future trends associated with SARS-CoV-2 B.1.617.2 (Delta) or other variants and increased COVID-19 vaccination among children.

### 22. **Trans-Placental Transfer of SARS-Cov-2 Antibodies in recovered and BNT162b2-vaccinated patients.**

Treger S et al. *Am J Obstet Gynecol*. 2021 Dec 1:S0002-9378(21)02625-9. doi:

10.1016/j.ajog.2021.11.1365. [https://www.ajog.org/article/S0002-9378\(21\)02625-9/fulltext](https://www.ajog.org/article/S0002-9378(21)02625-9/fulltext)

The neonatal population was found to be more susceptible to a severe SARS-CoV-2 infection. Data regarding transfer of anti-SARS-CoV-2 antibodies to the neonate of vaccinated women is limited, including only three studies concerning late third trimester vaccination. The objective of this study was to assess the trans-placental transfer of anti-SARS-CoV-2 antibodies in women vaccinated with the BNT162b2 vaccine during the second and third trimester.

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## GUIDELINES & CONSENSUS STATEMENTS

[Update to living WHO guideline on drugs for covid-19.](#) *BMJ*. 2021 Dec 6;375:n2936. doi: 10.1136/bmj.n2936.

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## FDA / CDC / NIH / WHO Updates

CDC - SARS-CoV-2 B.1.1.529 (Omicron) Variant — United States, December 1–8, 2021. *MMWR Morb Mortal Wkly Rep*. ePub: 10 December 2021. DOI: <http://dx.doi.org/10.15585/mmwr.mm7050e1>

[CDC Expands COVID-19 Booster Recommendations to 16-and-17-year-olds](#)

[FDA Authorizes New Long-Acting Monoclonal Antibodies for Pre-exposure Prevention of COVID-19 in Certain Individuals](#)

[WHO recommends against the use of convalescent plasma to treat COVID-19](#)

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## Commentary & News

[PFIZER AND BIONTECH PROVIDE UPDATE ON OMICRON VARIANT](#)

## Poetry

[My COVID Experience: "I Wish It Was Different"](#) Marianne Johnstone-Petty [**Providence author**]. *J Palliat Med*. 2021 Nov 25. doi: 10.1089/jpm.2021.0566.

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