

COVID-19 Resource Desk

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New Research

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Diagnostics & Screening

1. Clinical evaluation of SARS-CoV-2 rapid antigen tests during the Omicron wave in South

Africa. Samsunder N, et al. *J Infect Dis.* 2022 Aug 3;jiac333. doi: 10.1093/infdis/jiac333.

<https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiac333/6654839>

We evaluated the performance of nasal and nasopharyngeal Standard Q COVID-19 Ag tests (SD Biosensor) and the Panbio COVID-19 Ag Rapid Test Device (nasal, Abbott) against the Abbott RealTime SARS-CoV-2 assay during the Omicron (21 M, 21K and 21L) wave in South Africa. Overall, all evaluated tests performed well with high level of sensitivity (ranging from 77.78-81.42%) and excellent specificity values (>99%). The sensitivity of rapid antigen tests increased above 90% in samples with Ct <20, and all three tests performed best within first week of symptom onset. The Panbio Ag test performed best in the context of Omicron 21L infections, that were also characterised by significantly lower Ct values compared to infections with 21K and 21 M.

2. Duration of Symptoms and Association with Positive Home Rapid Antigen Test Results After Infection With SARS-CoV-2.

Cosimi LA, et al. *JAMA Netw Open.* 2022 Aug 1;5(8):e2225331. doi: 10.1001/jamanetworkopen.2022.25331.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2794884>

Current US Centers for Disease Control and Prevention COVID-19 guidance for nonimmunocompromised individuals allows ending isolation after 5 days if the individual is asymptomatic or afebrile with improving symptoms. Culturable virus, currently the best proxy for transmissibility, is reported after day 5. It has been proposed that rapid antigen tests (RATs) might assist in determining isolation periods. However, while RATs correlate with culture positivity during early infection, there are minimal data after day 5, when persistent RAT positivity has been reported. We sought to compare rates of RAT positivity, COVID-19 symptoms, and positive viral culture starting day 6 after a COVID-19 diagnosis.

Epidemiology & Public Health

3. Environmental and societal factors associated with COVID-19-related death in people with rheumatic disease: an observational study.

Izadi Z et al. *Lancet Rheumatol.* 2022 Jul 25. doi:

10.1016/S2665-9913(22)00192-8.

<https://www.sciencedirect.com/science/article/pii/S2665991322001928>

Our findings highlight the importance of environmental and societal factors as potential explanations of the observed regional disparities in COVID-19 outcomes among people with rheumatic disease and lay foundation for a new research agenda to address these disparities.

Prognosis

- 4. Risk of covid-19 related deaths for SARS-CoV-2 omicron (B.1.1.529) compared with delta (B.1.617.2): retrospective cohort study.** Ward IL et al. *BMJ*. 2022 Aug 2;378:e070695. doi: 10.1136/bmj-2022-070695. <https://www.bmj.com/content/378/bmj-2022-070695>

The results support earlier studies showing a reduction in severity of infection with omicron BA.1 compared with delta in terms of hospital admission. This study extends the research to also show a reduction in the risk of covid-19 death for the omicron variant compared with the delta variant.

Survivorship & Rehabilitation

- 5. Rates and Factors Associated with Documentation of Diagnostic Codes for Long COVID in the National Veterans Affairs Health Care System.** Ioannou GN et al. *JAMA Netw Open*. 2022 Jul 1;5(7):e2224359. doi: 10.1001/jamanetworkopen.2022.24359. <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2794788>

Long-COVID care was documented in a variety of clinical settings, with great variability across regions and medical centers and was documented more commonly in older persons, those with higher comorbidity burden, those with more severe acute COVID-19 presentation and those who were unvaccinated at the time of infection. These findings provide support and guidance for health care systems to develop systematic approaches to the evaluation and management of patients who may be experiencing long COVID.

- 6. Acute Occupational and Physical Therapy for COVID-19 Patients: A Retrospective Cohort Study.** Coakley K, et al. *Arch Phys Med Rehabil*. 2022 Aug 1:S0003-9993(22)00538-X. doi: 10.1016/j.apmr.2022.07.010. <https://doi.org/10.1016/j.apmr.2022.07.010>

Patients admitted with COVID-19 experienced significant functional impairments, but also demonstrated improvement during the course of their hospitalizations. This study can facilitate healthcare provider awareness of the detrimental functional impacts of COVID-19 and the potential role of rehabilitation services for these patients.

Therapeutics

- 7. Effect of pulmonary rehabilitation approaches on dyspnea, exercise capacity, fatigue, lung functions and quality of life in patients with COVID-19: A Systematic Review and Meta-Analysis.** Ahmed I, et al. *Arch Phys Med Rehabil*. 2022 Jul 28:S0003-9993(22)00512-3. doi: 10.1016/j.apmr.2022.06.007. [https://www.archives-pmr.org/article/S0003-9993\(22\)00512-3/fulltext](https://www.archives-pmr.org/article/S0003-9993(22)00512-3/fulltext)

DATA SYNTHESIS: A total of 8 RCTs involving 449 participants were included in the review. PR was found to be significantly effective in improving dyspnea (5 studies, SMD -2.11 [95% CI, -2.96 to -1.27; p<0.001]) and exercise capacity (MD 65.85 m [95% CI, 42.86 to 88.83; p<0.001]) in patients with both acute and chronic COVID-19 with mild to severe symptoms whereas, fatigue (MD -2.42 [95%CI, -2.72 to -2.11, p<0.05]) and lung functions (MD 0.26 L [95%CI, 0.04 to 0.48, p<0.05]) were significantly improved in acute COVID-19 patients with mild symptoms. The effect of PR on QoL was inconsistent across studies. PR was found to be safe and feasible for patients with COVID-19.

CONCLUSION: Evidence from studies indicates that PR program is superior to no intervention in improving dyspnea, exercise capacity, lung functions, and fatigue in patients with COVID-19. PR appears to be safe and beneficial for both acute and chronic COVID-19 patients.

- 8. Baricitinib in patients admitted to hospital with COVID-19 (RECOVERY): a randomised, controlled, open-label, platform trial and updated meta-analysis.** RECOVERY Collaborative Group. *Lancet*. 2022 Jul 30;400(10349):359-368. doi: 10.1016/S0140-6736(22)01109-6. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(22\)01109-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)01109-6/fulltext)

In patients hospitalised with COVID-19, baricitinib significantly reduced the risk of death but the size of benefit was somewhat smaller than that suggested by previous trials. The total randomised evidence to date suggests that JAK inhibitors (chiefly baricitinib) reduce mortality in patients hospitalised for COVID-19 by about one-fifth.

- 9. Tenofovir Disoproxil Fumarate/Emtricitabine and Baricitinib for Patients at High Risk of Severe COVID-19: The PANCOVID Randomized Clinical Trial.** Montejano R et al. *Clin Infect Dis*. 2022 Jul 30:ciac628. doi: 10.1093/cid/ciac628. <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciac628/6652179>

Our results do not suggest a beneficial effect of TDF/FTC; nevertheless, they are compatible with the beneficial effect of baricitinib already established by other clinical trials.

- 10. Association between AZD7442 (tixagevimab-cilgavimab) administration and SARS-CoV-2 infection, hospitalization and mortality.** Kertes J, et al. *Clin Infect Dis*. 2022 Jul 29:ciac625. doi: 10.1093/cid/ciac625. <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciac625/6651663>

AZD7442 among ICI may protect against Omicron variant infection and severe disease, and should be considered for pre-exposure prophylactic AZD7442.

- 11. Real-world effectiveness of early remdesivir and sotrovimab in the highest-risk COVID-19 outpatients during the Omicron surge.** Picciracchio N, et al. *J Antimicrob Chemother*. 2022 Aug 1:dkac256. doi: 10.1093/jac/dkac256. <https://academic.oup.com/jac/advance-article/doi/10.1093/jac/dkac256/6652940>

RESULTS: Patients treated with remdesivir were significantly less likely to be hospitalized or visit the ED within 29 days from symptom onset (11% versus 23.3%; OR = 0.41, 95% CI = 0.17-0.95). Patients receiving sotrovimab were also less likely to be hospitalized or visit the ED (8% versus 23.3%; OR = 0.28, 95% CI = 0.11-0.71). There was no difference in the incidence of hospitalizations/ED visits between sotrovimab and remdesivir.

CONCLUSIONS: Our highest-risk outpatients with Omicron-related COVID-19 who received early sotrovimab or remdesivir had significantly lower likelihoods of a hospitalization and/or ED visit.

12. Effectiveness of REGEN-COV antibody combination in preventing severe COVID-19 outcomes.

Hayek S et al. *Nat Commun.* 2022 Aug 2;13(1):4480. doi: 10.1038/s41467-022-32253-9.

<https://www.nature.com/articles/s41467-022-32253-9>

REGEN-COV, a combination of the monoclonal antibodies casirivimab and imdevimab, has been approved as a treatment for high-risk patients infected with SARS-CoV-2 within five days of their diagnosis. We performed a retrospective cohort study, and used data repositories of Israel's largest healthcare organization to determine the real-world effectiveness of REGEN-COV treatment against COVID-19-related hospitalization, severe disease, and death. We compared patients infected with Delta variant and treated with REGEN-COV (n = 289) to those infected but not-treated with REGEN-COV (n = 1,296). Demographic and clinical characteristics were used to match patients and for further adjustment as part of the Cox model. Estimated treatment effectiveness was defined as one minus the hazard ratio. Treatment effectiveness of REGEN-COV was 56.4% (95% CI: 23.7-75.1%) in preventing COVID-19 hospitalization, 59.2% (95% CI: 19.9-79.2%) in preventing severe COVID-19, and 93.5% (95% CI: 52.1-99.1%) in preventing COVID-19 death in the 28 days after treatment. In conclusion, REGEN-COV was effective in reducing the risk of severe sequelae in high-risk COVID-19 patients.

13. Hyperimmune globulin for severely immunocompromised patients hospitalized with COVID-19: a randomized, controlled trial.

Huygens S et al. *J Infect Dis.* 2022 Aug 4;jjac334. doi:

10.1093/infdis/jiac334. [https://academic.oup.com/jid/advance-](https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiac334/6654843)

[article/doi/10.1093/infdis/jiac334/6654843](https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiac334/6654843)

The aim of this randomized, controlled trial is to determine whether anti-SARS-CoV-2 hyperimmune globulin protects against severe COVID-19 in severely immunocompromised, hospitalized, COVID-19 patients. Patients were randomly assigned to receive anti-SARS-CoV-2 hyperimmune globulin (COVIG) or intravenous immunoglobulin without SARS-CoV-2 antibodies. Severe COVID-19 was observed in two out of ten (20%) patients treated with COVIG compared to seven out of eight (88%) in the IVIG control group (p = 0.015, Fisher's exact test). COVIG may be a valuable treatment in severely immunocompromised, hospitalized, COVID-19 patients and should be considered when no monoclonal antibody therapies are available. The trial was registered at www.trialregister.nl (#NL9436).

Vaccines / Immunology

14. Levels of SARS-CoV-2 antibodies among fully vaccinated individuals with Delta or Omicron variant breakthrough infections.

Stærke NB et al. *Nat Commun.* 2022 Aug 1;13(1):4466. doi:

10.1038/s41467-022-32254-8. <https://www.nature.com/articles/s41467-022-32254-8>

SARS-CoV-2 variants of concern have continuously evolved and may erode vaccine induced immunity. In this observational cohort study, we determine the risk of breakthrough infection in a fully vaccinated cohort. SARS-CoV-2 anti-spike IgG levels were measured before first SARS-CoV-2 vaccination and at day 21-28, 90 and 180, as well as after booster vaccination. Breakthrough infections were captured through the Danish National Microbiology database. incidence rate ratio (IRR) for breakthrough infection at time-updated anti-spike IgG levels was determined using Poisson regression. Among 6076 participants, 127 and 364 breakthrough infections due to Delta and Omicron variants were observed.

IRR was 0.29 (95% CI 0.15-0.56) for breakthrough infection with the Delta variant, comparing the highest and lowest quintiles of anti-spike IgG. For Omicron, no significant differences in IRR were observed. These results suggest that quantitative level of anti-spike IgG have limited impact on the risk of breakthrough infection with Omicron.

15. Infection with SARS-CoV-2 Omicron Variant 24 Days after Non-Omicron Infection, Pennsylvania, USA. Seid AG, et al. *Emerg Infect Dis.* 2022 Aug 1;28(9). doi:

10.3201/eid2809.220539. https://wwwnc.cdc.gov/eid/article/28/9/22-0539_article

A 42-year-old man, with up-to-date COVID-19 vaccination, experienced symptomatic SARS-CoV-2 infection in December 2021. Mutation tests suggested a non-Omicron variant. After his recovery, and 24 days after the first positive SARS-CoV-2 test, he had onset of symptomatic infection with the BA.1.1 (Omicron) variant, which was confirmed by whole-genome sequencing.

16. Development of Resistance-Associated Mutations After Sotrovimab Administration in High-risk Individuals Infected With the SARS-CoV-2 Omicron Variant. Birnie E, et al. *JAMA.* 2022 Aug 1. doi: 10.1001/jama.2022.13854. <https://jamanetwork.com/journals/jama/fullarticle/2794999>

The SARS-CoV-2 Omicron variant of concern is currently the dominant variant circulating globally. Sotrovimab is among the few monoclonal antibodies that has retained its neutralizing activity against Omicron/BA.1 and received Emergency Use Authorization for treatment of patients at risk for progression to severe disease. However, concerns have been raised about the potential induction of spike protein resistance-associated viral mutations, especially in immunocompromised patients who are at risk for prolonged infection with SARS-CoV-2. We investigated whether resistance-associated mutations developed after treatment with sotrovimab in high-risk patients infected with the SARS-CoV-2 Omicron variant.

17. Association of Receiving a Fourth Dose of the BNT162b Vaccine With SARS-CoV-2 Infection Among Health Care Workers in Israel. Israeli-Hospitals 4th Vaccine Working Group. *JAMA Netw Open.* 2022 Aug 1;5(8):e2224657. doi: 10.1001/jamanetworkopen.2022.24657.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2794864>

In this cohort study, the fourth BNT162b2 vaccine dose resulted in a reduced breakthrough infection rate among hospital staff. This reduction was lower than that observed after the third dose; nevertheless, considering the high infectivity of the Omicron variant, which led to critical medical staff shortages, a fourth vaccine dose should be considered to mitigate the infection rate among HCWs.

18. Effectiveness of mRNA COVID-19 vaccines against Omicron and Delta variants in a matched test-negative case-control study among US veterans. Young-Xu Y, et al. *BMJ Open.* 2022 Aug 3;12(8):e063935. doi: 10.1136/bmjopen-2022-063935.

<https://bmjopen.bmj.com/content/12/8/e063935>

Among an older, mostly male, population with comorbidities, we found that an mRNA vaccine booster was highly effective against infection, hospitalisation and death. Although the effectiveness of booster vaccination against infection was moderately higher against Delta than against the Omicron SARS-CoV-2 variant, effectiveness against severe disease and death was similarly high against both variants.

19. Robust neutralizing antibody responses after single-dose BNT162b2 vaccination at long intervals from prior SARS-CoV-2 infection and ceiling effect with repeated vaccination:

Running title: Optimal vaccination interval and ceiling effect. Noh JY, et al. *J Infect.* 2022 Jul 31:S0163-4453(22)00456-X. doi: 10.1016/j.jinf.2022.07.024.

<https://www.sciencedirect.com/science/article/pii/S016344532200456X>

This prospective cohort study was conducted on 36 individuals infected with the ancestral Wuhan-1 strain of SARS-CoV-2 who received three doses of the BNT162b2 COVID-19 vaccine. We investigated the kinetics of anti-SARS-CoV-2 nAbs by measuring anti-SARS-CoV-2 nAbs 3 weeks after the first dose (V1-3w), 1 month after the second dose (V2-1m), 3 months after the second dose (V2-3m), and 3 weeks after the third dose of BNT162b2 (V3-3w).

20. Effectiveness Associated with BNT162b2 Vaccine Against Emergency Department and Urgent Care Encounters for Delta and Omicron SARS-CoV-2 Infection Among Adolescents Aged 12 to 17 Years. Tartof SY, et al. *JAMA Netw Open.* 2022 Aug 1;5(8):e2225162. doi:

10.1001/jamanetworkopen.2022.25162.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2794882>

These findings suggest that 2 doses of the BNT162b2 COVID-19 vaccine were associated with high levels of protection against ED and UC encounters related to the Delta and Omicron variants of SARS-CoV-2 in the first few months after vaccination. However, effectiveness waned over time, especially against Omicron. A third dose of BNT162b2 was associated with improved protection against Omicron beyond that seen initially after 2 doses, underscoring the importance of boosters for adolescents aged 12 to 17 years.

21. Safety of Booster Doses of Coronavirus Disease 2019 (COVID-19) Vaccine in Pregnancy in the Vaccine Adverse Event Reporting System. Moro PL, et al. *Obstet Gynecol.* 2022 Aug 3. doi:

10.1097/AOG.0000000000004889. <https://doi.org/10.1097/aog.0000000000004889>

Review of reports after a booster dose of mRNA COVID-19 vaccine in pregnant people in VAERS found their safety profile was comparable with that of published reports after primary COVID-19 vaccination in pregnant people.

Women & Children

22. COVID-19 Hospitalization Among Children <18 Years by Variant Wave in Norway. Whittaker R, et al. *Pediatrics.* 2022 Aug 2:e2022057564. doi: 10.1542/peds.2022-057564.

<https://publications.aap.org/pediatrics/article/doi/10.1542/peds.2022-057564/188698/COVID-19-Hospitalization-Among-Children-lt-18>

We do not find clear evidence that different variants have influenced the risk of hospitalization with acute COVID-19 among unvaccinated children and adolescents in Norway. The lower risk of this outcome with Omicron and Delta may reflect changes in other factors over time, such as the testing strategy, maternal vaccination and/or hospitalization criteria. The emergence of Omicron has reduced the risk of MIS-C.

23. Preterm birth among pregnant persons with severe acute respiratory syndrome Coronavirus 2 infection. Newton SM, et al. *J Perinatol*. 2022 Aug 4. doi: 10.1038/s41372-022-01467-6.
<https://doi.org/10.1038/s41372-022-01467-6>

Critical COVID-19 in the second or third trimester was associated with increased risk of preterm birth. This finding can be used to guide prevention strategies, including vaccination, and inform clinical practices for pregnant persons.

24. Post-COVID-19 Symptoms and Conditions Among Children and Adolescents - United States, March 1, 2020-January 31, 2022. Kompaniyets L, et al. *MMWR Morb Mortal Wkly Rep*. 2022 Aug 5;71(31):993-999. doi: 10.15585/mmwr.mm7131a3.
<https://doi.org/10.15585/mmwr.mm7131a3>

Patients with COVID-19 were less likely than were patients without to experience respiratory signs and symptoms, symptoms of mental conditions, muscle disorders, neurological conditions, anxiety and fear-related disorders, mood disorders, and sleeping disorders. COVID-19 prevention strategies, including vaccination for all eligible children and adolescents, are critical to prevent SARS-CoV-2 infection and subsequent illness, including post-COVID symptoms and conditions (9).

FDA / CDC / NIH / WHO Updates

[CDC - Interim Recommendation of the Advisory Committee on Immunization Practices for Use of the Novavax COVID-19 Vaccine in Persons Aged ≥18 years - United States, July 2022.](#)

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