

COVID-19 Resource Desk

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New Research

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Diagnostics & Screening

1. **Universal admission testing with a rapid molecular point-of-care test and real-time polymerase chain reaction (PCR) assay for the detection of severe acute respiratory coronavirus virus 2 (SARS-CoV-2): Comparative performance and infection prevention implications.** Mena Lora AJ, et al. *Infect Control Hosp Epidemiol.* 2022 Oct 18:1-3. doi: 10.1017/ice.2022.244. <https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/universal-admission-testing-with-a-rapid-molecular-pointofcare-test-and-realtime-polymerase-chain-reaction-pcr-assay-for-the-detection-of-severe-acute-respiratory-coronavirus-virus-2-sarscov2-comparative-performance-and-infection-prevention-implications/A2B5F78E4C8E81ED4B48B7AED44BF240>

The coronavirus disease 2019 (COVID-19) pandemic has strained hospitals and healthcare systems worldwide, with bed capacity and throughput posing considerable challenges during surges.¹ In the United States, >70% of hospitals have <200 beds and most have a combination of single- and multiple-occupancy rooms, which complicates the placement of COVID-19 patients in cohorts.² With an estimated 30% of cases asymptomatic, rapid and reliable testing is important to safely placing inpatients in cohort.³ Small and critical-access hospitals often lack the volume or capacity for on-site molecular testing. Many safety-net hospitals are financially vulnerable and lack capital for new large-throughput molecular testing equipment.⁴ Point-of-care (POC) tests can be easily deployed in these settings. The IDNOW SARS-CoV-2 test (Abbott Laboratories, Abbott, IL) is a rapid POC test that provides results within 15 minutes. Our urban safety-net community hospital deployed admission testing using IDNOW in patients with and without COVID-19 symptoms. Paired parallel swabs were sent to a reference laboratory for confirmatory testing. We evaluated IDNOW accuracy and its impact on infection prevention workflow.

Epidemiology & Public Health

2. **The Impact of the COVID-19 Pandemic and Associated Control Measures on the Mental Health of the General Population : A Systematic Review and Dose-Response Meta-analysis.** Salanti G et al. *Ann Intern Med.* 2022 Oct 18. doi: 10.7326/M22-1507. <https://www.acpjournals.org/doi/10.7326/M22-1507>

Although an initial increase in average symptoms of depression and anxiety and an association between higher numbers of reported cases and more stringent measures were found, changes in mental health symptoms varied substantially across studies after the first 2 months of the pandemic. This suggests that different populations responded differently to the psychological stress generated by the pandemic and its containment measures.

Therapeutics

3. **Efficacy and safety of fluvoxamine for the treatment of COVID-19 patients: a systematic review and meta-analysis.** Cheema HA, et al. *J Infect.* 2022 Oct 13:S0163-4453(22)00608-9. doi: 10.1016/j.jinf.2022.10.012. [https://www.journalofinfection.com/article/S0163-4453\(22\)00608-9/fulltext](https://www.journalofinfection.com/article/S0163-4453(22)00608-9/fulltext)

Fluvoxamine, a widely available, inexpensive drug that is one of the selective serotonin reuptake inhibitors (SSRIs), has shown potential for treating COVID-19 as an early outpatient treatment, despite many recommended repurposed medicines failing 5. The underlying mechanism of the fluvoxamine effect in COVID-19 is currently unclear, but it is thought to be multifactorial. In addition to functioning as an SSRI, fluvoxamine has a strong affinity for the σ -1 receptor (S1R), which is believed to be the mechanism by which it achieves its anti-inflammatory and immunomodulatory properties. S1R stimulation is thought to have an immunomodulatory effect by lowering stress in the endoplasmic reticulum brought on by viral replication, which in turn lowers the generation of inflammatory cytokines 6. In order to combine the existing data and assess the efficiency and safety of fluvoxamine as a treatment for COVID-19, we undertook this updated meta-analysis.

4. **Cardiovascular Drug Interactions with Nirmatrelvir/Ritonavir in Patients With COVID-19: JACC Review Topic of the Week.** Abraham S et al. *J Am Coll Cardiol.* 2022 Oct 6:S0735-1097(22)06825-5. doi: 10.1016/j.jacc.2022.08.800. <https://www.sciencedirect.com/science/article/pii/S0735109722068255>

Nirmatrelvir-ritonavir (NMVr) is used to treat symptomatic, nonhospitalized patients with coronavirus disease-2019 (COVID-19) who are at high risk of progression to severe disease. Patients with cardiovascular risk factors and cardiovascular disease are at a high risk of developing adverse events from COVID-19 and as a result have a higher likelihood of receiving NMVr. Ritonavir, the pharmaceutical enhancer used in NMVr, is an inhibitor of the enzymes of CYP450 pathway, particularly CYP3A4 and to a lesser degree CYP2D6, and affects the P-glycoprotein pump. Co-administration of NMVr with medications commonly used to manage cardiovascular conditions can potentially cause significant drug-drug interactions and may lead to severe adverse effects. It is crucial to be aware of such interactions and take appropriate measures to avoid them. In this review, we discuss potential drug-drug interactions between NMVr and commonly used cardiovascular medications based on their pharmacokinetics and pharmacodynamic properties.

5. **Effect of remdesivir post hospitalization for COVID-19 infection from the randomized SOLIDARITY Finland trial.** Nevalainen OPO et al. *Nat Commun.* 2022 Oct 18;13(1):6152. doi: 10.1038/s41467-022-33825-5. <https://www.nature.com/articles/s41467-022-33825-5>

We report the first long-term follow-up of a randomized trial (NCT04978259) addressing the effects of remdesivir on recovery (primary outcome) and other patient-important outcomes one year after

hospitalization resulting from COVID-19. Of the 208 patients recruited from 11 Finnish hospitals, 198 survived, of whom 181 (92%) completed follow-up. At one year, self-reported recovery occurred in 85% in remdesivir and 86% in standard of care (SoC) (RR 0.94, 95% CI 0.47-1.90). We infer no convincing difference between remdesivir and SoC in quality of life or symptom outcomes ($p > 0.05$). Of the 21 potential long-COVID symptoms, patients reported moderate/major bother from fatigue (26%), joint pain (22%), and problems with memory (19%) and attention/concentration (18%). In conclusion, after a one-year follow-up of hospitalized patients, one in six reported they had not recovered well from COVID-19. Our results provide no convincing evidence of remdesivir benefit, but wide confidence intervals included possible benefit and harm.

Vaccines / Immunology

- 6. Severe COVID-19 outcomes after full vaccination of primary schedule and initial boosters: pooled analysis of national prospective cohort studies of 30 million individuals in England, Northern Ireland, Scotland, and Wales.** Agrawal U et al. *Lancet*. 2022 Oct 15;400(10360):1305-1320. doi: 10.1016/S0140-6736(22)01656-7.

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(22\)01656-7/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)01656-7/fulltext)

Older people, those with multimorbidity, and those with specific underlying health conditions remain at increased risk of COVID-19 hospitalisation and death after the initial vaccine booster and should, therefore, be prioritised for additional boosters, including novel optimised versions, and the increasing array of COVID-19 therapeutics.

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- 7. Estimated Protection of Prior SARS-CoV-2 Infection Against Reinfection with the Omicron Variant Among Messenger RNA-Vaccinated and Nonvaccinated Individuals in Quebec, Canada.** Carazo S et al. *JAMA Netw Open*. 2022 Oct 3;5(10):e2236670. doi: 10.1001/jamanetworkopen.2022.36670.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2797311>

The findings of this study suggest that vaccination with 2 or 3 mRNA vaccine doses among individuals with prior heterologous SARS-CoV-2 infection provided the greatest protection against Omicron-associated hospitalization. In the context of program goals to prevent severe outcomes and preserve health care system capacity, a third mRNA vaccine dose may add limited protection in twice-vaccinated individuals with prior SARS-CoV-2 infection.

- 8. Association of mRNA Vaccination with Clinical and Virologic Features of COVID-19 Among US Essential and Frontline Workers.** HEROES-RECOVER Network, Thompson MG et al. *JAMA*. 2022 Oct 18;328(15):1523-1533. doi: 10.1001/jama.2022.18550.

<https://jamanetwork.com/journals/jama/fullarticle/2797418>

In a cohort of US essential and frontline workers with SARS-CoV-2 infections, recent vaccination with 2 or 3 mRNA vaccine doses less than 150 days before infection with Delta or Omicron variants, compared with being unvaccinated, was associated with attenuated symptoms, duration of illness, medical care seeking, or viral load for some comparisons, although the precision and statistical significance of

9. Neutralization Escape by SARS-CoV-2 Omicron Subvariant BA.4.6. Hachmann NP, et al. *N Engl J Med.* 2022 Oct 19. doi: 10.1056/NEJMc2212117. <https://doi.org/10.1056/nejmc2212117>

Our data show that the BA.4.6 omicron subvariant markedly escaped neutralizing antibodies induced by infection or vaccination, with values that were lower than BA.5 titers by a factor of 2 to 2.7, which suggests continued evolution of SARS-CoV-2. These findings provide immunologic context for the increasing prevalence of BA.4.6 in populations in which BA.5 is currently dominant. Moreover, the R346T mutation had also recently been observed in other omicron subvariants, including BA.2.75 and BA.5, which suggests the biologic relevance of this mutation. The potential effect of the emergence of the BA.4.6 subvariant on vaccine boosters containing BA.5 immunogens or on infection with BA.5 remains to be determined.

10. Bivalent SARS-CoV-2 mRNA vaccines increase breadth of neutralization and protect against the BA.5 Omicron variant in mice. Scheaffer SM, et al. *Nat Med.* 2022 Oct 20. doi: 10.1038/s41591-022-02092-8. <https://doi.org/10.1038/s41591-022-02092-8>

As a primary two-dose immunization series in mice, both bivalent vaccines induced greater neutralizing antibody responses against Omicron variants than the parental, monovalent mRNA-1273 vaccine. When administered to mice as a booster at 7 months after the primary vaccination series with mRNA-1273, the bivalent vaccines induced broadly neutralizing antibody responses. Whereas the majority of anti-Omicron receptor binding domain antibodies in serum induced by mRNA-1273, mRNA-1273.214, and mRNA-1273.222 boosters cross-reacted with the antecedent Wuhan-1 spike antigen, the mRNA-1273.214 and mRNA-1273.222 bivalent vaccine boosters also induced unique BA.1 and BA.4/5-specific responses, respectively. Although boosting with parental or bivalent mRNA vaccines substantially improved protection against BA.5 compared to mice receiving two vaccine doses, the levels of infection, inflammation, and pathology in the lung were lowest in animals administered the bivalent mRNA vaccines. Thus, boosting with bivalent Omicron-based mRNA-1273.214 or mRNA-1273.222 vaccines enhances immunogenicity and confers protection in mice against a currently circulating SARS-CoV-2 strain.

11. Effectiveness of COVID-19 mRNA Vaccines Against COVID-19-Associated Hospitalizations Among Immunocompromised Adults During SARS-CoV-2 Omicron Predominance - VISION Network, 10 States, December 2021-August 2022. Britton A, et al. *MMWR Morb Mortal Wkly Rep.* 2022 Oct 21;71(42):1335-1342. doi: 10.15585/mmwr.mm7142a4. <https://doi.org/10.15585/mmwr.mm7142a4>

Given the incomplete protection against hospitalization afforded by monovalent COVID-19 vaccines, persons with immunocompromising conditions might benefit from updated bivalent vaccine booster doses that target recently circulating Omicron sublineages, in line with ACIP recommendations. Further, additional protective recommendations for persons with immunocompromising conditions, including the use of prophylactic antibody therapy, early access to and use of antivirals, and enhanced nonpharmaceutical interventions such as well-fitting masks or respirators, should also be considered.

12. Effectiveness of Monovalent mRNA Vaccines Against COVID-19-Associated Hospitalization Among Immunocompetent Adults During BA.1/BA.2 and BA.4/BA.5 Predominant Periods of SARS-CoV-2 Omicron Variant in the United States - IVY Network, 18 States, December 26,

2021-August 31, 2022. IVY Network. *MMWR Morb Mortal Wkly Rep.* 2022 Oct 21;71(42):1327-1334. doi: 10.15585/mmwr.mm7142a3. <https://doi.org/10.15585/mmwr.mm7142a3>

The newly authorized bivalent COVID-19 vaccines include mRNA from the ancestral SARS-CoV-2 strain and from shared mRNA components between BA.4 and BA.5 lineages and are expected to be more immunogenic against BA.4/BA.5 than monovalent mRNA COVID-19 vaccines (6-8). All eligible adults aged ≥ 18 years§ should receive a booster dose, which currently consists of a bivalent mRNA vaccine, to maximize protection against BA.4/BA.5 and prevent COVID-19-associated hospitalization.

Women & Children

13. Evaluation of mRNA-1273 Vaccine in Children 6 Months to 5 Years of Age. KidCOVE Study Group. *N Engl J Med.* 2022 Oct 19. doi: 10.1056/NEJMoa2209367.

<https://doi.org/10.1056/nejmoa2209367>

Two 25- μ g doses of the mRNA-1273 vaccine were found to be safe in children 6 months to 5 years of age and elicited immune responses that were noninferior to those in young adults.

14. Association Between Time Interval from COVID-19 Vaccination to In Vitro Fertilization and Pregnancy Rate After Fresh Embryo Transfer. Shi W, et al. *JAMA Netw Open.* 2022 Oct 3;5(10):e2236609. doi: 10.1001/jamanetworkopen.2022.36609.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2797318>

Findings of this study suggest that receipt of the first inactivated COVID-19 vaccine dose 60 days or less before fertilization treatment is associated with a reduced rate of pregnancy. In patients undergoing IVF treatment with a fresh embryo transfer, the procedure may need to be delayed until at least 61 days after COVID-19 vaccination.

15. Tachyarrhythmias During Hospitalization for COVID-19 or Multisystem Inflammatory Syndrome in Children and Adolescents. Dionne A et al. *J Am Heart Assoc.* 2022 Oct 17:e025915. doi: 10.1161/JAHA.122.025915.

<https://www.ahajournals.org/doi/10.1161/JAHA.122.025915>

Tachyarrhythmias were a rare complication of acute severe COVID-19 and multisystem inflammatory syndrome in children and adolescents and were associated with worse clinical outcomes, highlighting the importance of close monitoring, aggressive treatment, and postdischarge care.

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