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

   - Asymptomatic and symptomatic omicron infections had similar peak viral loads.
   - Omicron viral loads peaked before symptom onset in 21% symptomatic infections.
   - Public health interventions were associated with lower peak viral loads.

Epidemiology & Public Health

   - Data support the assumption that RSV-specific antibody concentrations declined during the COVID-19 pandemic in all age groups and are in line with a previous report showing decay of antibodies to RSV.
   - We do not have data on RSV-specific antibody kinetics in our cohort before the pandemic and there are relatively large variations between individuals, so the effect on susceptibility to RSV is not clear yet.
   - Antibodies to the F protein, especially in pre-fusion confirmation, have an important role in the neutralisation of RSV and were previously shown to correlate well with virus neutralisation. However, the degree to which virus neutralisation is affected and the exact correlation with immune protection are yet to be determined. Following this preliminary analysis, additional timepoints, including follow-up samples, are being investigated to support and extend these findings. In conclusion, monitoring changes in antibody concentrations could identify populations susceptible to RSV infection.

   - The Centers for Disease Control and Prevention recommends a COVID-19 vaccine booster dose for all persons >18 years of age. We analyzed data from the National Immunization Survey-Adult COVID
Module collected during February 27-March 26, 2022 to assess COVID-19 booster dose vaccination coverage among adults. We used multivariable logistic regression analysis to assess factors associated with vaccination. COVID-19 booster dose coverage among fully vaccinated adults increased from 25.7% in November 2021 to 63.4% in March 2022. Coverage was lower among non-Hispanic Black (52.7%), and Hispanic (55.5%) than non-Hispanic White adults (67.7%). Coverage was 67.4% among essential healthcare personnel, 62.2% among adults who had a disability, and 69.9% among adults who had medical conditions. Booster dose coverage was not optimal, and disparities by race/ethnicity and other factors are apparent in coverage uptake. Tailored strategies are needed to educate the public and reduce disparities in COVID-19 vaccination coverage.

Healthcare Delivery & Healthcare Workers


This cross-sectional study evaluates subsequent journal publication of COVID-19–related articles initially posted as medRxiv preprints in 2020.

Survivorship & Rehabilitation


There is a considerable portion of patients having persistent olfactory dysfunction 24 months after SARS-CoV-2 infection when evaluated by psychophysical tests, even for those without self-reported symptoms.


Residual lung abnormalities were estimated in up to 11% of people discharged following COVID-19 related hospitalization. Health services should monitor at-risk individuals to elucidate long-term functional implications.


The SARS-CoV-2 Omicron (B.1.1.529) variant has been associated with less severe acute disease, however, concerns remain as to whether long-term complaints persist to a similar extent as for earlier variants. Studying 1 323 145 persons aged 18-70 years living in Norway with and without SARS-CoV-2 infection in a prospective cohort study, we found that individuals infected with Omicron had a similar
risk of post-covid complaints (fatigue, cough, heart palpitations, shortness of breath and anxiety/depression) as individuals infected with Delta (B.1.617.2), from 14 to up to 126 days after testing positive, both in the acute (14 to 29 days), sub-acute (30 to 89 days) and chronic post-covid (≥90 days) phases. However, at ≥90 days after testing positive, individuals infected with Omicron had a lower risk of having any complaint (43 (95%CI = 14 to 72) fewer per 10,000), as well as a lower risk of musculoskeletal pain (23 (95%CI = 2-43) fewer per 10,000) than individuals infected with Delta. Our findings suggest that the acute and sub-acute burden of post-covid complaints on health services is similar for Omicron and Delta. The chronic burden may be lower for Omicron vs Delta when considering musculoskeletal pain, but not when considering other typical post-covid complaints.

**Therapeutics**


In this retrospective cohort study using health insurance claims and hospital chargemaster data, remdesivir treatment was associated with a significantly reduced inpatient mortality overall among patients hospitalized with COVID-19. Results of this analysis using data collected during routine clinical practice and state-of-the-art methods complement results from randomized clinical trials. Future areas of research include assessing the association of remdesivir treatment with inpatient mortality during the circulation of different variants and relative to time from symptom onset.


The addition of inhaled sargramostim to SOC improved P(A-a)O2, a measure of oxygenation, by day 6 in hospitalized patients with COVID-19-associated acute hypoxemia and was well tolerated. Inhaled sargramostim is delivered directly to the lung, minimizing systemic effects, and is simple to administer making it a feasible treatment option in patients in settings where other therapy routes may be difficult. Although proportionally lower rates of intubation and mortality were observed in sargramostim-treated patients, this study was insufficiently powered to demonstrate significant changes in these outcomes. However, the significant improvement in gas exchange with sargramostim shows this inhalational treatment enhances pulmonary efficiency in this severe respiratory illness. These data provide strong support for further evaluation of sargramostim in high-risk patients with COVID-19.


• We assessed the effect of famotidine administration in COVID-19 patients.
• We included 10 studies out of which 3 were randomized controlled trials (RCTs).
• Famotidine does not reduce mortality or hasten recovery in COVID-19 patients.
• Large-scale RCTs are needed to investigate its efficacy.


Patients with COVID-19+ with STEMI requiring MCS have very high in-hospital mortality, likely related to the significantly higher pulmonary involvement compared with patients with COVID-19- with STEMI requiring MCS.


The study did not meet its primary end point in patients with severe COVID-19. Subgroup analyses may indicate specific populations with hyperinflammation that could benefit from pacritinib, although further clinical trials would be needed to confirm these effects.

TRIAL REGISTRATION: ClinicalTrials.gov Identifier: NCT04404361.


In this systematic review and meta-analysis, aggregate differences in representation for several demographic groups in COVID-19 prevention and treatment trials in the US were found. Strategies to better ensure diverse representation in COVID-19 studies are needed, especially for prevention trials.


These findings suggest that the use of an SGLT-2i before COVID-19 infection is associated with lower COVID-19-related adverse outcomes. In addition to SGLT-2is, glucagon-like peptide-1 receptor agonists and metformin were also associated with relatively low risk of adverse outcomes.


In this cohort study, viral rebound was uncommon in patients taking molnupiravir or nirmatrelvir-ritonavir and was not associated with increased risk of mortality. Given these findings, novel oral antivirals should be considered as a treatment for more patients with COVID-19 in the early phase of the infection.

A total of 341 patients (ensitrelvir 125 mg group, 114; ensitrelvir 250 mg group, 116; and placebo group, 111; male, 53.5%-64.9%; mean age, 35.3-37.3 years) were included in the efficacy analyses. The change from baseline in the SARS-CoV-2 titer on day 4 was significantly greater with both ensitrelvir doses than with placebo (differences from placebo: -0.41 log10 50% tissue-culture infectious dose/mL, P < 0.0001 for both). The total score of the 12 COVID-19 symptoms did not show a significant difference between the ensitrelvir groups and placebo group. The time-weighted average change from baseline up to 120 hours was significantly greater with ensitrelvir versus placebo in several subtotal scores, including acute symptoms and respiratory symptoms. Most adverse events were mild in severity.

**CONCLUSIONS:** Ensitrelvir treatment demonstrated a favorable antiviral efficacy and potential clinical benefit with an acceptable safety profile.

**Transmission / Infection Control**


Our data suggest that the residual risk of virus transmission after 5 days of isolation following diagnosis or symptom onset is low.


Non-patient areas of the hospital may pose risks for infection transmission and further attention should be paid to these areas. Standardization of sampling methods will improve understanding of levels of environmental contamination. The pandemic has demonstrated a need to review and act upon the challenges of older hospital buildings meeting current ventilation guidance.

**Vaccines / Immunology**


We estimated the effectiveness of a fourth dose of mRNA COVID-19 vaccine against Omicron infections and severe outcomes over time among long-term care residents in Ontario, Canada. Fourth doses provide additional protection against Omicron-related outcomes, but the protection wanes over time, with more waning seen against infection than severe outcomes.

This systematic review and meta-analysis found low incidence rate and largely favorable early outcomes of COVID-19 mRNA vaccine-associated myopericarditis in adolescents and young adults from a wide range of populations. These findings are reassuring but continued follow-up is warranted.


CONCLUSION: SARS-CoV-2 breakthrough infections are common among fully (boosted) vaccinated HCP. However, full COVID-19 vaccination offered considerable protection against hospitalization. Our findings may contribute to defining the optimal timing for booster vaccinations. More efficient COVID-19 vaccines that will also confer protection against SARS-CoV-2 infection are urgently needed.


The newly emerged SARS-CoV-2 Omicron sublineages, including the BA.2-derived BA.2.75.2 and the BA.5-derived BQ.1.1 and XBB.1, have accumulated additional spike mutations that may affect vaccine effectiveness. Here we report neutralizing activities of three human serum panels collected from individuals 23-94 days after dose 4 of a parental mRNA vaccine, 14-32 days after a BA.5-bivalent-booster from individuals with 2-4 previous doses of parental mRNA vaccine, or 15-32 days after a BA.5-bivalent-booster from individuals with previous SARS-CoV-2 infection and 2-4 doses of parental mRNA vaccine. The results showed that a BA.5-bivalent-booster elicited a high neutralizing titer against BA.4/5 measured at 14- to 32-day post-boost; however, the BA.5-bivalent-booster did not produce robust neutralization against the newly emerged BA.2.75.2, BQ.1.1, or XBB.1. Previous infection significantly enhanced the magnitude and breadth of BA.5-bivalent-booster-elicited neutralization. Our data support a vaccine update strategy that future boosters should match newly emerged circulating SARS-CoV-2 variants.


This study found a significantly lower rate of mortality among individuals with myocarditis after mRNA vaccination compared with those with viral infection-related myocarditis. Prognosis of this iatrogenic condition may be less severe than naturally acquired viral infection-related myocarditis.
https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(22)00792-7/fulltext
We compared neutralisation of BA.1, BA.4 and BA.5 (identical S proteins, BA.4-5), BA.4.6, and the emerging omicron sublineages BA.2.75.2 (circulating mainly in India), BJ.1 (parental lineage of the currently expanding XBB recombinant), and BQ.1.1 (the incidence of which is increasing in the USA and Europe). We tested neutralisation by antibodies that were induced upon triple vaccination, vaccination and breakthrough infection during the BA.1 and BA.2 wave or BA.5 wave in Germany, triple vaccination plus monovalent or bivalent mRNA booster vaccination, or triple vaccination plus breakthrough infection (BA.1 and BA.2 wave) and a bivalent mRNA booster vaccination.

In this study, during a period in which both the Delta and Omicron variants were circulating, SARS-CoV-2 booster vaccination was associated with significant reductions in SARS-CoV-2 infections, hospitalizations, and the combined end point of hospitalization or death among residents of 2 US nursing home systems. These findings suggest that administration of vaccine boosters to nursing home residents may have an important role in preventing COVID-19-associated morbidity and mortality.

COVID-19 vaccination both before and after having COVID-19 significantly decreased post–COVID-19 conditions for the circulating variants during the study period although vaccine effectiveness was low.

**Women & Children**

The risk for preterm birth and stillbirth after symptomatic Sars-CoV-2 in pregnancy is increased especially after early infection and within the first 4 weeks after infection.
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