

# Organ transplant recipients vulnerable to COVID-19 even after vaccination

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Johns Hopkins Medicine researchers have shown that although two doses of a vaccine against SARS-CoV-2 — the virus that causes COVID-19 — confers some protection for people who have received solid organ transplants, it's still not enough to enable them to dispense with COVID safety measures. Credit: Graphic created by M.E. Newman, Johns Hopkins Medicine, with public domain images and background transplant surgery photograph courtesy of Johns Hopkins Medicine

In a study published today in the *Journal of the American Medical Association (JAMA)*, Johns Hopkins Medicine researchers show that although two doses of a vaccine against SARS-CoV-2—the virus that causes COVID 19—confers some protection for people who have received solid organ transplants, it's still not enough to enable them to dispense with masks, physical distancing and other safety measures.

This is a follow-up study to [an earlier one published in March in JAMA](#), in which the researchers reported that only 17% of the participating transplant recipients produced sufficient antibodies after just one dose of a two-dose COVID-19 [vaccine](#) regimen.

"While there was an increase in those with detectable antibodies—54% overall—after the second shot, the number of transplant recipients in our second study whose antibody levels reached high enough levels to ward off a SARS-CoV-2 infection was still well below what's typically seen in people with healthy immune systems," says study lead author Brian Boyarsky, M.D., a surgery resident at the Johns Hopkins University School of Medicine.

"Based on our findings, we recommend that transplant recipients and other immunocompromised patients continue to practice strict COVID-19 safety precautions, even after vaccination," Boyarsky says.

People who receive solid organ transplants (such as hearts, lungs and kidneys) often must take drugs to suppress their immune systems and prevent rejection. Such regimens may interfere with a transplant recipient's ability to make antibodies to foreign substances, including the protective ones produced in response to vaccines.

The new study evaluated this immunogenic response following the second dose of either of the two messenger RNA (mRNA) vaccines—made by Moderna and Pfizer-BioNTech—for 658 transplant

recipients, none of whom had a prior diagnosis of COVID-19. The participants completed their two-dose regimen between Dec. 16, 2020, and March 13, 2021.

In the most recent study, the researchers found that only 98 of the 658 study participants—15%—had detectable antibodies to SARS-CoV-2 at 21 days after the first vaccine dose. This was comparable to the 17% reported in the March study looking at immune response after only one vaccine dose.

At 29 days following the second dose, the number of participants with detectable antibodies rose to 357 out of 658—54%. After both vaccine doses were administered, 301 out of 658 participants—46%—had no detectable antibody at all while 259—39%—only produced [antibodies](#) after the second shot.

The researchers also found that among the participants, the most likely to develop an antibody response were younger, did not take immunosuppressive regimens including anti-metabolite drugs and received the Moderna vaccine. These were similar to the associations seen in the March single-dose study.

"Given these observations, [transplant](#) recipients should not assume that two vaccine doses guarantee sufficient immunity against SARS-CoV-2 any more than it did after just one dose," says study co-author Dorry Segev, M.D., Ph.D., the Marjory K. and Thomas Pozefsky Professor of Surgery and Epidemiology and director of the Epidemiology Research Group in Organ Transplantation at the Johns Hopkins University School of Medicine.

Segev says that future studies should seek to improve COVID-19 vaccine responses in this population, including additional booster doses or modulating the use of immunosuppressive medications so that

sufficient antibody levels are achieved.

**More information:** Brian J. Boyarsky et al. Antibody Response to 2-Dose SARS-CoV-2 mRNA Vaccine Series in Solid Organ Transplant Recipients, *JAMA* (2021). [DOI: 10.1001/jama.2021.7489](https://doi.org/10.1001/jama.2021.7489)

Provided by Johns Hopkins University

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