

COVID-19 vaccine creates incentive to improve our health

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Steven Loborec, assistant director in the Ohio State Wexner Medical Center Department of Pharmacy, prepares a syringe containing the Pfizer vaccine.

While we wait for our turn to get vaccinated against SARS-CoV-2, we could—and probably should—use the time to make sure we bring our

healthiest emotional and physical selves to the treatment, a new review of previous research suggests.

Ohio State University researchers reviewed 49 [vaccine studies](#) in humans dating back 30 years that document how stress, depression and poor health behaviors can negatively affect the body's immune response to vaccination, and how improving health factors can enhance that response.

The impaired immune responses tended to fall into three categories—interference with the development of antibodies against the pathogen, more rapid erosion of antibody protection that does develop, or intensification of vaccination's side effects.

The steady stress of navigating our disrupted routines and social lives during the pandemic may have set us back when it comes to maintaining healthy behaviors, the researchers say. They report on recent data from across the world documenting higher depressive and anxiety symptoms and more insomnia during lockdown, increased alcohol sales and overeating, and fewer average step counts recorded by Fitbits.

There is good news: The power to make improvements that give us the best chance for a healthy response to the [coronavirus](#) vaccine is almost completely in our control. Managing stress through exercise and mindfulness meditation, getting enough sleep, quitting or curbing tobacco use and improving our diets—even in the short term, right around the time of vaccination—could influence how our bodies respond, the evidence suggests. And for those struggling with depression, now would be a good time to seek professional help.

"When we think of vaccine efficacy, we often think of the vaccine itself. My motivation was to draw attention to the fact that we bring important factors to the table as well—and those factors are modifiable," said

Annelise Madison, first author of the paper and a [graduate student](#) in clinical psychology at Ohio State.

"If we can address them now, when most of the world has yet to receive the vaccine, we have the chance to make our response to the vaccine quicker, more robust and lasting."

A number of the studies reviewed were led by senior author Janice Kiecolt-Glaser, director of Ohio State's Institute for Behavioral Medicine Research and a professor of psychiatry and psychology in the College of Medicine. Kiecolt-Glaser and her late husband, immunologist Ronald Glaser, were pioneers in mind-body research that showed how stress impairs physical health in a variety of ways, primarily by hampering the human immune response.

The review is accepted for publication in the journal *Perspectives on Psychological Science*.

The studies in this review investigated the effects of psychological factors and behaviors on the immune response to a range of vaccine types, such as influenza, hepatitis B, typhoid and pneumonia. Because many findings have been consistent across responses to different vaccines, the team considered them likely to be relevant to the SARS-CoV-2 vaccine.

Kiecolt-Glaser pointed to a few of her past studies that illustrate the varying effects of different types of stress on human responses to vaccination.

In a study of medical students' [immune response](#) to a highly effective hepatitis B vaccine, all students eventually developed antibodies—but the students who were more stressed or anxious about exams coinciding with the inoculations took significantly longer to develop protective

antibodies.

Research on older adults' response to a pneumococcal pneumonia vaccine showed that though all study participants initially developed antibodies quickly, the antibody response diminished over the next three to six months in those who were chronically stressed caregivers looking after spouses with dementia.

"These findings suggest that with the COVID-19 vaccine, when people are more stressed and more anxious, it may take a little longer to develop antibodies, so they should probably allow a little more time before they assume they're protected," Kiecolt-Glaser said. "Another possibility is that stress may erode protection more rapidly."

Her lab's past research has also shown that older adults—who are considered at higher risk for severe COVID-19 symptoms—sometimes don't respond well to flu vaccines. In one study, only 20% of stressed adults who were age 71 or older developed antibodies after a flu shot.

Additional studies in her lab showed that people who were depressed experienced post-vaccination side effects of lethargy, malaise and irritability for a longer period of time than people who were not depressed.

Side effects are normal—the vaccination is training the immune system to recognize a pathogen by initiating an inflammatory response that can make us feel sick—but they can cause some people to avoid vaccines.

"Side effects are from an inflammatory response to the vaccine, which is a good thing," Kiecolt-Glaser said. "You want to see a strong response to the vaccine. That's one reason we know the vaccine is effective. On the other hand, the absence of a response doesn't mean it's not effective."

According to previous research, a range of interventions may help us all get the most out of the COVID-19 vaccine: Massage and expressive writing for stress management, short- and long-term physical activity including 25 minutes of arm exercises before injection, and nutritional supplementation all helped increase antibody response or reduce [side effects](#) in past studies.

"And when you know you're going to get the [vaccine](#) the next day, try to get a good night's sleep. Just one night, and going in fully rested, can be helpful," Kiecolt-Glaser said.

Though we may be suffering from health-advice fatigue 10 months after the first lockdown, Madison said now may be the most important time to heed the experts' recommendations.

"I know it can be difficult day in and day out during the pandemic to keep prioritizing things we know we should do," she said. "But we could use this time as a wake-up call. These are important health behaviors to keep engaging in, especially as we're preparing to get vaccinated—which is a really good thing."

More information: Annelise Madison et al, Psychological and Behavioral Predictors of Vaccine Efficacy: Considerations for COVID-19, *Perspectives on Psychological Science* (2021). [DOI: 10.31124/advance.13528418.v1](https://doi.org/10.31124/advance.13528418.v1)

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