Do at-home COVID-19 tests detect omicron?

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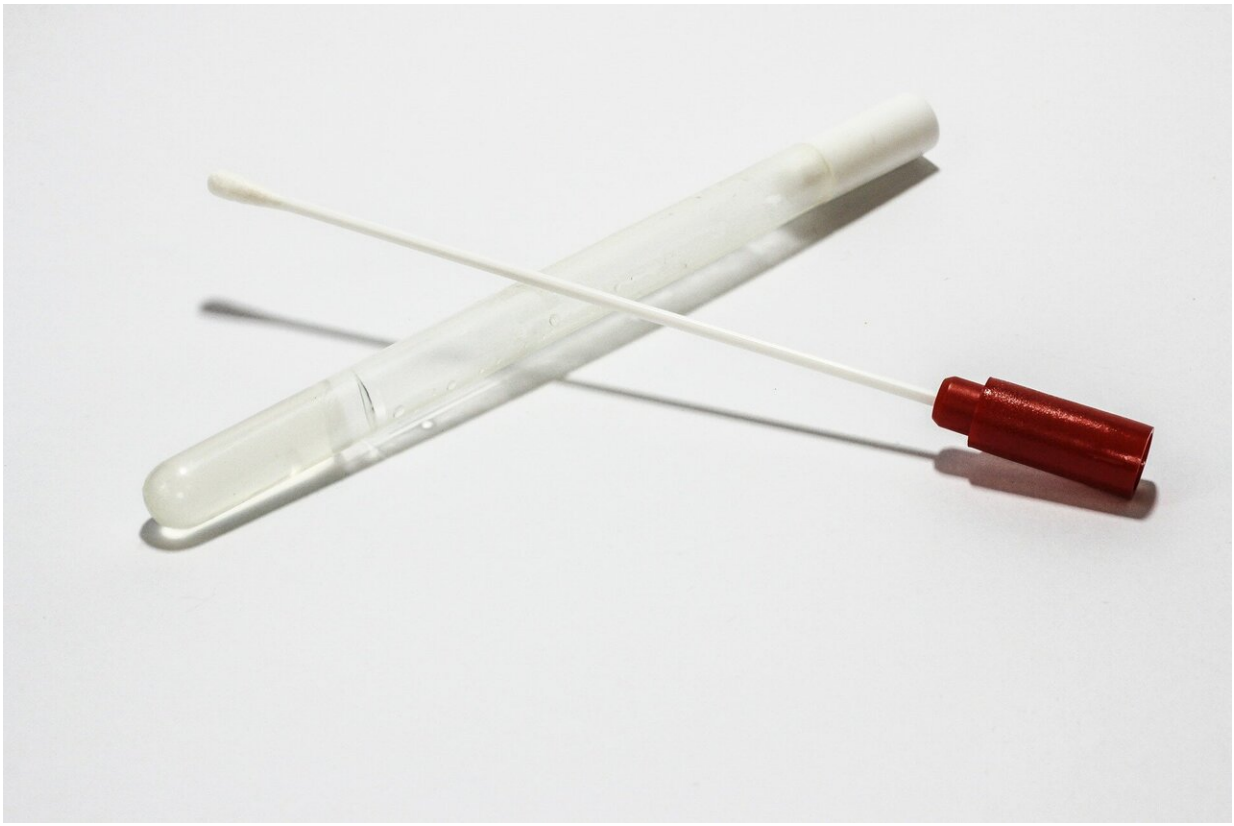

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At-home rapid COVID-19 tests are getting harder to find leading up to the Christmas holiday. Adding to the confusion, new preliminary information that suggests some rapid tests may not be able to detect the omicron variant, Dr. Anthony Fauci said last week.

Northwestern University experts say this: Stay calm, test on and get vaccinated/boosted.

"While the Centers for Disease Control (CDC) evaluate which home tests are less effective at providing an accurate result, it is important to keep in mind that rapid tests are an important tool for keeping everyone safe as many of us travel to be with family over the holidays," said Thom McDade, the Carlos Montezuma Professor in the department of anthropology and a biological anthropologist at the Institute for Policy Research at Northwestern.

Pablo Penaloza-MacMaster, assistant professor of microbiology-immunology at Northwestern University Feinberg School of Medicine, said as the virus mutates, it could render some rapid antigen tests ineffective, but most are still working.

"It depends which antigen the test is trying to detect," Penaloza-MacMaster said. "If it's going after the nucleocapsid (an internal RNA-binding protein), it's typically better because this viral protein is more conserved, meaning it mutates less than the spike protein."

A quick internet search should be able to reveal which viral protein a specific at-home rapid test is targeting, Penaloza-MacMaster said. But cautioned that while omicron might evade one test today, that same test may work to detect a new variant in the future.

"As omicron surges, we can expect to see more breakthrough infections among people who were vaccinated four or more months ago due to declining levels of antibody protection," McDade said. "Booster shots generate large antibody responses, and rapid tests help us identify and isolate infections—both are important tools as we navigate this new phase of the pandemic."

Can you get different variants at once?

"In theory, yes, it's called a 'super-infection,'" Penaloza-MacMaster said. "We see that with viruses like HIV, in which a person can get co-infected with two viral strains at once. In this scenario, viral recombination may occur, potentially resulting in hybrid variants. Thus, getting boosted is becoming increasingly important not only to prevent transmission, but also to mitigate further evolution of the virus by genetic recombination."

Are we going to need to get COVID-19 boosters every year?

"We don't have the answer yet," Penaloza-MacMaster said. "We need more long-term data to evaluate the durability of the immune response with that third vaccine dose. But it's highly likely that this third dose will confer robust protection for a long time."

One reason for this is due to immune maturation. During the first two-shot vaccination regimen, the prime-boost interval was expedited because of the urgent need to generate a rapid and robust immune response in as many people as possible, Penaloza-MacMaster said.

"But immune responses are like wine—with a long 'resting period,' they mature and become better able to expand upon a booster vaccination," Penaloza-MacMaster said. "A third dose administered months after the second dose 'corrects' for the short-term interval that occurred between the first and second jab (which consisted of only a three- to four-week interval). Studies have also shown that the third dose generates a broader immune response, allowing improved recognition of viral variants. It doesn't mean that you won't need another dose down the road if more variants emerge, but at least we can say that the third dose is providing an additional benefit over the second dose."

McDade's research investigates how social, cultural and ecological contexts shape human development, physiological function and health. In June of 2020, McDade and his colleagues at Feinberg School of Medicine launched the Screening for Coronavirus Antibodies in Neighborhoods (SCAN), a community-based study, to track the spread of the virus that causes COVID-19 and to investigate what circumstances and behaviors may impact exposure to the virus and the development of immunity.

The main aim of Penaloza-MacMaster's research is to develop better vaccines for viral infections. Prior to the COVID-19 pandemic, his research was mainly focused on chronic viral infections, including HIV. He has successfully pivoted and built upon that work to apply it to COVID-19 research, such as his work on the "2.0" of the COVID-19 vaccine, universal coronavirus vaccines and current vaccine trial protocols.

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