

## Swab the Throat as Well as the Nose? The Debate Over the Best Way to Test for SARS-CoV-2

Rita Rubin, MA

**T**hree times over 5 days. That's the most recent [advice](#) from the US Food and Drug Administration (FDA), posted in December 2022, about how often asymptomatic people should take rapid antigen tests to make sure they've tested negative for COVID-19.

"Not helpful, since [infected] people transmit during this time!" California Institute of Technology chemist Rustem Ismagilov, PhD, director of the Jacobs [Medical News website](#) Institute for Molecular Engineering for Medicine, wrote in an email to *JAMA*.

Ismagilov's research suggests the reason that it might take so long for some infected people to test positive with nasal swabs is that, at the beginning, SARS-CoV-2 viral loads are higher in the throat.

As of December, the FDA hadn't authorized any rapid test that involves a throat swab, spokesperson James McKinny told *JAMA* in an email.

Yet, some studies have found that swabbing both the nose and the throat increases test sensitivity—from a little more to a lot more—than nasal swabs alone. However, other studies haven't found an added benefit from swabbing both sites.

### How It Started

As Omicron began to take off a year ago, [videos](#) posted on social media suggested that throat swabs or throat and nasal swabs combined might be better at detecting the newest SARS-CoV-2 variant.

At the time, proponents had little more than anecdotal evidence to go on, but they reasoned that a sore throat was often the first symptom of an Omicron infection, so why not check there for the virus?

In response, some [scientists](#) and the [FDA](#) began posting warnings on social media against throat swabbing, noting a lack of evidence to support the value of tickling the tonsils when performing a rapid antigen test.



iStock.com/Pascal Skwara

### How It's Going

Although virtually all rapid antigen test manufacturers still recommend only nasal swabs, some public health authorities outside the US suggest that swabbing the throat and nose enhances the tests' accuracy:

- Canada in the provinces of [Newfoundland and Labrador](#), [Nova Scotia](#), [Ontario](#), [Prince Edward Island](#), [Saskatchewan](#)
- [Israel](#) (the Israel Ministry of Health's [website](#) refers to swabbing the oral cavity, not specifically the throat)
- The [UK National Health Service](#) offers a rapid antigen test that requires both a throat and nose swab.

### What the Research Shows

Research findings about whether to swab both the throat and the nose have been limited and mixed.

#### The Nays

- Scientists from the Atlanta Center for Microsystems-Engineered Point-of-Care technologies at Emory University assessed nasal and throat swabs and saliva specimens from a cross-sectional cohort of 121 symptomatic individuals and a group

of 3 members of a family who'd been exposed to SARS-CoV-2. Self-collected specimens taken over time in the family cohort consistently showed that the highest viral load was in the nose. In the other cohort, specimens collected by health care professionals showed significant overlap in diagnostic performance among all 3 specimen types. In a February 2022 [preprint](#) that had not been peer reviewed, the researchers concluded that people should continue to use the tests as directed.

- Researchers collected nasal and throat swabs from 115 randomly selected people at a walk-up community testing site in San Francisco. The swabs were used with the BinaxNOW rapid antigen test and with polymerase chain reaction (PCR) testing. Adding a throat swab improved detection by only 4%, according to a May 2022 [article](#). In an email to *JAMA*, coauthor Diane Havlir, MD, said the small incremental gain observed wasn't worth the time and effort required to institute throat swabbing at her community site. Havlir is chief of the HIV, Infectious Diseases, and Global Medicine Division at Zuckerberg San Francisco General Hospital and Trauma Center.

### The Yeas

- Ismagilov and his coauthors compared nasal and throat swabs and saliva samples over time in 2 small studies of people at the earliest stage of Omicron infection. One study used PCR testing only while the other used PCR testing and the Quidel QuickVue At-Home rapid antigen test, which employs nasal swabs, to quantify viral load in the specimens. Both studies were posted as preprints in July 2022 and had not been peer reviewed. For most participants in the studies, viral loads increased in throat and saliva specimens before they did in nasal specimens, leading the authors to conclude that combining specimens may be the way to detect Omicron infections as early as possible.
- Nova Scotia researchers used the Abbott Panbio rapid antigen test (marketed as BinaxNOW in the US) to compare nasal swabs, throat swabs, and the 2 swabs combined from asymptomatic individuals at a community testing center. All participants also underwent PCR testing. Nasal swabs alone detected more PCR-confirmed COVID-19 than throat swabs alone, but the combination picked up the most cases of all, according to an [article](#) published in July 2022.

### Waiting for Validation

The FDA says swabbing the throat with tests authorized for use only with nasal swabs could cause harm.

One potential harm, according to the agency, would be decreased test sensitivity, although studies so far haven't found that to be the case. The problem, Ismagilov said, is that rapid antigen tests in the US have been validated only with samples from nasal swabs.

Manufacturers have little incentive to check whether adding throat swabs is safe and effective because their nasal swab tests are selling just fine, Ismagilov noted. (He is a cofounder and board member of Talis Biomedical, a California company that distributes a point-of-care COVID-19 rapid antigen test, authorized for prescription use only, which employs a nasal swab.) The FDA could mandate that manufacturers validate their tests using throat and nasal swabs, he added.

Whether that's likely to happen is another matter. "I think the FDA has been very focused on nasal testing because that's what we use for flu," Emory University critical care specialist Greg Martin, MD, said in an interview. Martin is a coprincipal investigator at the point-of-care technologies center and a co-author of the group's study comparing the use of different specimens in COVID-19 testing.

### What's Still Not Known

For now, several questions remain:

- Might a sample taken from the throat inhibit the test? Because the answer isn't known, Ismagilov said, he uses separate swabs and tests for his throat and nose. "The chemistry of those samples is not the same," Martin pointed out. For example, he said, digestive enzymes in the mouth and throat might cause a false-negative result.
- A related question is how might eating, drinking, or smoking shortly before swabbing the throat affect the sample? The Nova Scotia study didn't ask participants whether they'd munched, sipped, or lit up before testing. However, some public health authorities, such as Ontario Health, advise against eating, drinking, chewing gum, smoking, or vaping for at least 30 minutes before a throat swab.

- Could swabbing the throat and then the nose introduce unwelcome microbes into the latter? Pathologist Glenn Patriquin, MD, coauthor of the Nova Scotia testing study and codirector of bacteriology at Dalhousie University's QEII Diagnostic Microbiology Laboratory, said he gets asked that a lot but isn't too concerned because, swab or no swab, the throat and nose are already anatomically connected.
- Can people swab their throat well enough to get a good sample? The throat is a bigger piece of real estate than the nose, and, as Havlir noted, her study trained laboratory technicians to collect throat samples. In Patriquin's trial, volunteers coached participants on how to collect their samples. However, he and his coauthors wrote, "coaching could easily be translated to a brief instructional video for at-home/occupational use." A [video](#) produced by the UK's National Health Service is one example.

### The Upshot

Combining a nasal swab with a throat swab might improve the sensitivity of rapid antigen tests, but no one has found that throat swabs alone are superior to nasal swabs.

"We always say if you're going to swab one spot it should be the nose," Patriquin noted. "We would never recommend swabbing only the throat." ■

**Published Online:** January 11, 2023.  
doi:10.1001/jama.2022.23311

**Conflict of Interest Disclosures:** Dr Ismagilov reported having cofounded and serving as a board member and consultant for Talis Biomedical, which distributes a point-of-care COVID-19 rapid antigen test. No other disclosures were reported.

**Note:** Source references are available through embedded hyperlinks in the article text online.