

Nostril swab best way to test for COVID-19, study finds

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In a new study, Cornell researchers found that nasopharyngeal swabs—taken from far back inside the nostril—were more effective at detecting COVID-19 than saliva tests or swabs just inside the nostril or under the tongue.

The researchers also found that detection rates were lower in [asymptomatic patients](#), confirming the rationale for shortened isolation guidelines.

"The study addressed the very important issue of identifying a sample type that would allow reliable detection of the virus, without significantly compromising the sensitivity of detection," said Dr. Diego Diel, associate professor in the Department of Population Medicine and Diagnostic Sciences and director of the virology laboratory at the Animal Health Diagnostic Center, who was lead author of the study, published May 16 in *Microbiology Spectrum*.

Alongside Cornell colleagues, Diel obtained samples from patients in Tompkins County through a collaboration with Dr. Elizabeth Plocharczyk from the Cayuga Medical Center. Four different samples

were used: nasopharyngeal swabs, anterior nares swabs (front of the nostril), saliva and sublingual swabs (under the tongue). The scientists also collected samples from symptomatic, asymptomatic and post-symptomatic individuals—those who had recovered from illness—to better understand testing efficiency in these populations.

When they compared the different sample types, the researchers found that nasopharyngeal samples provided the best rate of detection, from 92 to 100%. This is likely because the virus replicates in the nasal turbinate, the tissue structures in the uppermost portion of the nose.

Detection rates from anterior nares and saliva specimens were slightly lower, at 92 to 96% for symptomatic patients. This detection rate was lower when the samples that came from asymptomatic patients (75% to 92%). SARS-CoV-2 detection of sublingual specimens was much poorer, with detection rates of only 40 to 60% from symptomatic patient specimens and 25% to 42% from asymptomatic patient specimens.

Detection rates in symptomatic, asymptomatic and post-symptomatic patients was fairly intuitive, with detection being most robust in symptomatic patients, ranging from 92 to 100%, depending on the test used. For all tests, the virus was slightly harder to detect in asymptomatic patients, at a rate of 75 to 96%. Once symptoms were resolved in post-symptomatic patients, detection was much more difficult.

The team also investigated infectivity—the level of infectious [viral particles](#) excreted in each of the sample types and from the different patient categories. As predicted, the most infectious samples came from symptomatic patients, while fewer than one-third of specimens collected from asymptomatic patients were infectious. The scientists were unable to isolate any infectious virus from post-symptomatic patient samples.

"We were surprised at the relatively short period in which infectious virus was detected," Diel said. "The data is aligned with current CDC guidelines and their decision to decrease patient isolation periods from an initial 14-day period to 10 and ultimately to five."

This new data gives health practitioners some practical guidance.

"This study served as the foundation for the Cornell COVID-19 surveillance program testing labs and confirmed the use of anterior nares specimens as the specimen of choice, given its reasonable sensitivity and ease of collection," Diel said.

More information: Rebecca L. Tallmadge et al, Viral RNA Load and Infectivity of SARS-CoV-2 in Paired Respiratory and Oral Specimens from Symptomatic, Asymptomatic, or Postsymptomatic Individuals, *Microbiology Spectrum* (2022). DOI: [10.1128/spectrum.02264-21](https://doi.org/10.1128/spectrum.02264-21)

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