

CORONAVIRUS

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# COVID-19 and PCR Testing

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The nose swab PCR test for COVID-19 is an accurate and reliable test for diagnosing COVID-19. A positive test means you likely have COVID-19. A negative test means you probably did not have COVID-19 at the time of the test. Get tested if you have symptoms of COVID-19 or have been exposed to someone who tested positive for COVID-19.

- Test Details
- Results and Follow-Up

## Related

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### OVERVIEW

## What is a PCR test?

PCR means polymerase chain reaction. It's a test to detect genetic material from a specific organism, such as a virus. The test detects the presence of a virus if you have the virus at the time of the test. The test could also detect fragments of the virus even after you are no longer infected.

## What is a COVID-19 PCR test?

The polymerase chain reaction (PCR) test for COVID-19 is a molecular test that analyzes your upper respiratory specimen, looking for genetic material (ribonucleic acid or RNA) of SARS-CoV-2, the virus that causes COVID-19. Scientists use the PCR technology to amplify small amounts of RNA from specimens into deoxyribonucleic acid (DNA), which is replicated until SARS-CoV-2 is detectable if present. The PCR test has been the gold standard test for diagnosing COVID-19 since

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authorized for use in February 2020. It's accurate and reliable.

## Who should get tested for COVID-19?

Your healthcare provider may recommend testing for [COVID-19](#) if you have any of the following symptoms:

- Fever or chills.
- Cough.
- Shortness of breath or difficulty breathing.
- Fatigue.
- Muscle or body aches.
- Headache.
- New loss of taste or smell.
- Sore throat.
- Congestion or runny nose.
- Nausea or vomiting.
- Diarrhea.

Not everyone with COVID-19 develops symptoms. And not all symptomatic people develop all of the symptoms listed above. Please check with your healthcare provider if you're feeling unwell during the COVID-19 pandemic — even if you've been vaccinated.

## TEST DETAILS

There are three key steps to the COVID-19 PCR test:

1. **Sample collection:** A healthcare provider uses a swab to collect respiratory material found in your nose. A swab is a soft tip on a long, flexible stick that goes into your nose. There are different types of nose swabs, including nasal swabs that collect a sample immediately inside your nostrils and nasopharyngeal swabs that go further into the nasal cavity for collection. Either type of swab is sufficient for collecting material for the COVID-19 PCR test. After collection, the swab is sealed in a tube and then sent to a laboratory.
2. **Extraction:** When a laboratory scientist receives the sample, they isolate (extract) genetic material from the rest of the material in the sample.
3. **PCR:** The PCR step then uses special chemicals and enzymes and a PCR machine called a thermal cycler. Each heating and cooling cycle increases (amplifies) the amount of the targeted

genetic material in the test tube. After many cycles, millions of copies of a small portion of the SARS-CoV-2 virus's genetic material are present in the test tube. One of the chemicals in the tube produces a fluorescent light if SARS-CoV-2 is present in the sample. Once amplified enough, the PCR machine can detect this signal. Scientists use special software to interpret the signal as a positive test result.

## RESULTS AND FOLLOW-UP

### What do COVID-19 PCR test results mean?

A **positive test result** means that it's likely that you have an infection with SARS-CoV-2. This could be due to asymptomatic infection, but if you have symptoms, then this infection is called COVID-19. Most people have mild illness and can recover safely at home without medical care. Contact your healthcare provider if your symptoms get worse or if you have questions or concerns.

A **negative test result** means you probably didn't have an infection with SARS-CoV-2 at the

time your specimen was collected. However, it's possible to have COVID-19 but not have the virus detected by the test. For example, this may happen if you recently became infected but you don't have symptoms yet — or it could happen if you've had COVID-19 for more than a week before being tested. A negative test doesn't mean you are safe for any length of time: You can be exposed to COVID-19 after your test, get infected and spread the SARS-Cov-2 virus to others.

If your test is positive, talk with your healthcare provider, stay home and separate yourself from others. If your test is negative, continue to take steps to protect yourself and others from getting COVID-19. Read more about [what to do if you test positive](#) and [ways to prevent getting infected with COVID-19](#).

## How long does it take to get coronavirus test results?

You should receive your test results as early as 24 hours after sample collection, but sometimes it can take a few days, depending on how long it takes the sample to reach the laboratory.

## How long do you test positive after having had COVID-19?

Because the PCR test is so sensitive, it can detect very small amounts of virus material. This means that the test can continue to detect fragments of SARS-CoV-2 virus even after you've recovered from COVID-19 and are no longer contagious. So you may continue to test positive if you've had COVID-19 in the distant past, even though you can't spread the SARS-CoV-2 virus to others.

Prolonged infection in immunocompromised individuals can occur where they shed infectious virus for months. Also, healthy people can become reinfected. If you test positive for SARS-CoV-2 but you think you might have already recovered from COVID-19, please discuss with a healthcare provider.

### ADDITIONAL DETAILS

## What's the difference between the PCR and antigen tests for COVID-19?

There are two types of tests for COVID-19: the

## PCR test and the antigen test.

- **Polymerase chain reaction (PCR).** This tests for the presence of the actual virus's genetic material or its fragments as it breaks down. PCR is the most reliable and accurate test for detecting active infection. PCR tests typically take hours to perform, but some are faster.
- **Antigen test:** This detects bits of proteins on the surface of the virus called antigens. Antigen tests typically take only 15 to 30 minutes. Rapid antigen tests are most accurate when used within a few days of the start of your symptoms, which is when the largest amount of virus is present in your body.

## Which COVID test is more accurate?

The antigen test is typically faster but is less sensitive than the PCR test. Because the antigen test is not as accurate as PCR, if an antigen test is negative, your healthcare provider could request a PCR test to confirm the negative antigen test result.

## How do I find out where to get tested for COVID-19?



If you have symptoms of COVID-19 or were exposed to people who have symptoms or have tested positive, you may want a test. First, talk with your healthcare provider. They will review your symptoms in person or on a video appointment. If needed, the provider orders a test and helps you find a testing location and time. Keep in mind that if you've been exposed to the SARS-CoV-2 virus but don't have symptoms, call the testing site first to make sure they can accommodate you.

You can also call or check the websites of your local hospitals in your health insurance network or check with community health centers or urgent care centers. The U.S. Department of Health and Human Services provides links to find [community-based testing sites](#) in your state. You can also check your state or local health department websites for the latest information on testing locations. The Centers for Disease Control provides links to these [state](#) and [local](#) health departments.

### **A note from Cleveland Clinic**

Accurate and quick tests are key to slowing the spread of COVID-19. If you develop symptoms, please call your healthcare provider or your local public health department to determine

where to go for testing. Trust your healthcare provider to recommend the quickest, most accurate test available. To keep those around you safe, you should wear a face mask that fits snugly over your nose, mouth and chin, and avoid close contact with others until you get the results of your COVID test. Be sure to monitor your symptoms and seek emergency care if you have:

- Trouble breathing.
- Persistent pain or pressure in your chest.
- New confusion.
- Aren't able to wake or stay awake.
- Blue lips or face.

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Last reviewed by a Cleveland Clinic medical professional on 08/24/2021.

## References

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