

# COVID-19 Testing: PCR Versus Serology Tips for the Allergist-Immunologist

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There are two types of tests currently available for COVID-19 testing that can detect whether a person currently has infection (polymerase chain reaction (PCR) testing) by testing for the virus, or had it in the past (serologic antibody testing), which tests for antibodies against the virus. Since there is sometimes confusion when the term COVID-19 testing is used, this document is designed to explain the differences between PCR and serology tests, and which test might be appropriate for testing.

| <b>Topic</b>               | <b>PCR Test</b>   | <b>Serology Test</b>   |
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| Why is the test performed? | PCR looks for the virus itself in the nose, throat, or other tissues to determine if there is an active infection with COVID-19 | Serology looks for antibodies against COVID-19 in the blood to determine if there has been an infection in the past. Antibodies to COVID-19 are formed after infection or following immunization with forthcoming vaccines to fight off infections. IgM is the first antibody that is first formed after infection or immunization and appears within 1-2 weeks. IgG antibody appears about 2 weeks later. IgM usually diminishes or disappears from the blood within a few months, but IgG can last for years. Some antibody tests test for both IgM and IgG, and some only test for IgG. |
| How is the test performed? | In most cases, a nasal or throat swab is taken by a healthcare provider, and that swab is sent to the lab for testing.          | This test uses a sample of blood.  |

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| <p>What does a positive test mean?</p> | <p>A positive PCR test means that the person being tested has an active COVID-19 infection.</p>   | <p>A positive antibody test means that the person being tested was infected with COVID-19 in the past or has been immunized with a forthcoming COVID-19 vaccine and that their immune system has developed antibodies to try to prevent infection.</p>  |
| <p>When is the test helpful?</p>       | <p>It can be used to determine who has an active infection at the time of testing. It can also help identify people who are contagious to others.</p> | <ul style="list-style-type: none"> <li>• It can identify people who had an infection in the past, even if they had no clinical symptoms at the time of their illness.</li> <li>• It may be able to help determine who has some level of immunity to COVID-19. This could help with decisions about who could safely work in certain jobs or if a COVID-19 is effective in producing protective immunity.</li> <li>• In some cases, it could help determine when COVID-19 illness occurred, since we know that IgM is formed before IgG and that IgM usually diminishes or disappears before IgG appears.</li> <li>• It can help determine who qualifies to donate convalescent plasma (a blood product that contains antibodies against COVID-19 and can be used as a COVID-19 treatment).</li> <li>• It can help public health officials and researchers know what percentage of the population has already had COVID-19.</li> </ul> |

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| <p>When is the test not as helpful?</p> | <ul style="list-style-type: none"> <li>• It only helps determine whether a person has an active infection at the time of testing. <ul style="list-style-type: none"> <li>✓ It does not help determine who had an infection in the past.</li> <li>✓ It also does not help determine which people who have been exposed to COVID-19 will develop active infection during 2 weeks after exposure.</li> </ul> </li> <li>• In some people, the virus can only be found by PCR for a few days at the beginning of the infection, so the test might not detect the virus if the swab is taken more than a few days after the illness starts.</li> <li>• In some people, the virus can be found by PCR in the nasal and throat secretions for several weeks, even longer than the time that they are actually contagious to other people.</li> <li>• This test requires certain kinds of swabs that may be in short supply or if the specimen is not obtained appropriately.</li> </ul> | <ul style="list-style-type: none"> <li>• It may be negative if it is performed too close to the beginning of an infection, when antibody is not detectable, which is why it should not be used to detect active COVID-19 infection.</li> <li>• Some antibody tests have low sensitivity and specificity and so may not produce reliable results.</li> <li>• Some antibody tests may cross-react with other coronaviruses that are not SARS-CoV-2, the virus that causes COVID-19, leading to false test results.</li> </ul> |
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