

CORONAVIRUS OUTBREAK



COVID-19 Testing Fact Sheet

Until an effective vaccine is available, testing for COVID-19 can help slow the spread of the disease. The two main methods are testing for the molecular presence of the disease or testing for antibodies to the disease. Molecular tests are more capable of informing whether you have active virus while serological tests inform whether you have been exposed to or have some level of immunity to the virus.

More research is necessary to determine the accuracy of serologic test results for COVID-19 and how to best use this technology to slow or stop the spread of this disease. The IAFF supports the recommendation from the Food and Drug Administration (FDA) that results from antibody testing alone should not be used to diagnose or exclude COVID-19 infection or to inform infection status.

Currently, the IAFF advises against the use of serologic testing alone as the basis of return-to-work decisions. Rather, such determinations should also include molecular testing and an evaluation by a healthcare provider.

SARS-CoV-2 and COVID-19

Coronavirus is a family of viruses, including the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), as well as some common colds. SARS-CoV-2 is the virus that causes Coronavirus disease 2019 (COVID-19). The serologic tests and polymerase chain reaction (PCR) tests are used to identify SARS-CoV-2 nucleic acid to determine if individuals have COVID-19.

Laboratory Testing

Infectious disease testing related to the COVID-19 disease:

	Molecular	Serologic
Detects for the presence of...	the genetic material (RNA) of the virus. Any viral nucleic acid present in the patient's sample is amplified by polymerase chain reaction (PCR)	host antibodies against viral antigens (an immune response)
Suitable Samples	nasopharyngeal swabs, oropharyngeal swabs, expectorated sputum, saliva	blood via finger prick

The FDA has authorized that serologic testing is limited to laboratories and licensed healthcare providers at the point of care. At this time there are no FDA-approved home testing kits.

Detection of Viral RNA

Tests that detect viral RNA levels can identify current infections and suggest infectivity and transmission risk for others. Currently, the most widely used RNA test on the market is the Reverse Transcriptase Polymerase Chain Reaction (RT-PCR), a real-time test (turnaround time from 15 minutes to several days) for the detection of nucleic acid from SARS-CoV-2 in upper and lower respiratory specimens (such as nasal, nasopharyngeal or oropharyngeal swabs) collected from individuals suspected of COVID-19. **Negative results do not mean there is no COVID-19 infection and should not be used as the sole basis for patient management decisions.**

Multiple studies have identified false negative results on initial PCR tests, but it's not clear why this happens. Reasons may include stage of illness, lower amounts of virus in certain anatomic sites and in certain patients, and suboptimal sample collection methods. Overall, the FDA has asserted that FDA-authorized nucleic acid amplification tests for COVID-19 meeting emergency use authorization criteria are highly reliable. Thus, these tests are currently the gold standard. However, these tests are not at a level of production that is close to meeting national needs.

Detection of Host Immune Response

Tests that identify host immune response are referred to as serological tests and are intended to be administered as simple blood tests. These tests can indicate whether an individual has been previously exposed to COVID-19. Antibody test results are important in detecting infections in individuals with few or no symptoms and have been used in conjunction with RT-PCR results in establishing a diagnosis or exclusion of COVID-19 infection. IgM and IgG are the two major antibodies assessed by serologic testing.

- 1. IgM** antibodies typically appear earlier within the course of infection – within days to about one week after the onset of symptoms. The antibodies can persist for a week to a few months.
- 2. IgG** antibodies develop later in the course of infection, typically appearing in the bloodstream around two weeks after infection and may last for months to several years.

Those with IgM only or IgM and IgG antibodies are likely in an early stage of infection, even if they don't have any symptoms. Ideally, fire fighters with these markers should undergo quarantine plus a reflex PCR test to confirm infectivity.

Summary

Expanding testing for COVID-19 is a top priority; however, there is limited information on the significance of the presence of antibodies detected by serologic testing. While serologic tests may indicate that an individual has an immune response to SARS-CoV-2, much remains unknown on how long individuals with an immune response suggested by the presence of IgG or IgM antibodies could shed infectious virus. **The IAFF is advising caution for how these tests are used and directs against the use of serologic testing alone for the basis of return-to-work decisions.** Rather, such determinations should include molecular testing and an evaluation by a healthcare provider. It is important to note that both molecular or serologic tests should be used with caution and as part of a comprehensive approach under the supervision of qualified healthcare professionals that considers whether an individual has symptoms of COVID-19, as there are reports of false results with each type of test.

It's important that members stay informed about the risks and benefits of testing and what the testing results may or may not mean and should continue to exercise recommended infection control practices, including handwashing, self-monitoring twice a day, social distancing and wearing a surgical mask or cloth mask, both on and off duty.

 **For more information, visit www.iaff.org/coronavirus**