



Facts About COVID Testing

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Quick tests, PCR tests, saliva tests, antigen tests, and so on. What is the best test to detect COVID-19? Why can't I get a quick test with results in 15 minutes? Why aren't quick tests available where I live? How reliable are the quick tests?

These and many other questions seem to be rampant as we deal with this pandemic. Below are answers to these questions and more.

What are the common tests for COVID-19?

PCR Tests

The bulk of the testing being performed in the country is based on a technology called polymerase chain reaction (PCR). This method identifies the virus that causes COVID-19 (named SARS-CoV-2) by amplifying and detecting the unique genetic material that distinguishes the virus from other viruses.

Government health agencies consider PCR tests to be the “gold standard” for COVID-19, meaning they are accepted as the best options currently available. In general, the tests are very **specific** for the COVID-19 virus; this means that false positives by PCR test are incredibly rare. However, the **sensitivity** for the virus—the likelihood of false negatives—is far from ideal. Collective experience worldwide using PCR testing during the COVID-19 pandemic has shown that the false negative rate may be as high as 30%. This is because successful detection of the virus depends on a high quality specimen (via a somewhat uncomfortable swab up the far reaches of the nasal passages), whose collection is well timed according to the clinical presentation and disease severity. Successful retrieval of the COVID virus is very much like hitting a moving target.

Saliva Tests

It is worth mentioning a subset of PCR tests that are new on the scene: saliva tests. The advantage of these tests is that the samples are easy to collect—the patient just spits into a tube. Kits are now available that can be collected at home and mailed into the reference laboratory for results. Because these tests are new, not much is known about how saliva testing compares to other methods in terms of accuracy. They are currently being utilized to screen large numbers of people, such as for schools and businesses.

The time it takes to receive results from a PCR test (a.k.a. the “turnaround time”) ranges from around 15 minutes to multiple days, depending on which testing platform is used and where a sample is analyzed.



Antigen Tests

Unlike PCR tests, which look for genetic material encoding viral proteins (antigens), antigen tests detect those proteins directly from a nasal or nasopharyngeal swab specimen. The benefit of these tests is that they are less complex and are therefore faster to perform, often around 15 minutes. As with PCR tests, false positives are rare. However, antigen tests are generally less sensitive than PCR tests, as many as 50% of negative results may be false. Like PCR tests, successful retrieval of antigen depends on the quality of the specimen and timing of the illness. Currently, it is recommended that symptomatic patients be tested by antigen test within the first few days of illness. National and state health agencies at this time feel that due to these issues with sensitivity, negative antigen test results do not rule out COVID-19 and should not be used as the sole basis for treatment or management; patients showing signs and symptoms of COVID-19 who are negative by antigen should be swabbed again and tested by PCR.

Recently, antigen tests have gained use in the public health domain being used for surveillance purposes in asymptomatic patients. Although most of these tests were not designed to be used in asymptomatic patients, the trend for this practice is gaining momentum. In theory, the lower sensitivity of antigen tests can be balanced out by frequent testing of groups being surveilled.

Antibody Tests

Antibody tests detect antibodies in the blood formed in response to previous infection. Unfortunately, the medical community doesn't know enough about the nature of antibodies against COVID-19 to determine their significance. It is still unknown whether antibodies against this virus are protective against future infections—and if so—for how long they are effective. Furthermore, many cheap, quick antibody tests are plagued by false negatives as well as false positives. This form of testing is helping us gain a better understanding of COVID-19 from a public health standpoint, and for identifying individuals who may serve as donors for convalescent plasma (plasma donated by those recovered from COVID-19). However, more research needs to be done in this area before we can use antibody testing at an individual patient level with any confidence.

Which testing methods are utilized by Sheridan Memorial Hospital? How long does it take to get results?

Sheridan Memorial Hospital currently uses two in-house testing platforms for COVID-19: Cepheid GeneXpert® and BioFire® instruments. Both are highly regarded systems for infectious disease molecular testing. In-house tests are used for patients whose COVID-19 status immediately affects patient care, including treatment and use of personal protective equipment (PPE) by hospital staff. The turnaround time for these tests is just over an hour.

When a person has signs and symptoms of COVID-19, but a test result does not immediately affect his or her care (e.g. a person who is sick but quarantining at home), their specimen is sent to the Wyoming Public Health Lab. Turnaround time varies according to test volumes, but is currently 24-48 hours. If a patient is asymptomatic, their sample is generally sent to Mayo Clinic. Current turnaround time is 3-7 days. At this time, SMH cannot offer in-house testing for all patients due to shortage of allotted supplies.



An antibody test is available through Mayo Clinic; however, clinical utility for this test is limited at this time.

Why aren't more rapid tests available in Sheridan?

Due to the current issues with accuracy—namely the high risk of false negatives and the downstream implications on patient care—SMH has chosen not to offer tests such as the Abbott ID Now (a rapid PCR test) or antigen tests. Such rapid tests are really only considered reliable if results for COVID-19 are positive. If the results are negative, the test should be “backed up” with an additional PCR testing method. This situation may change as the accuracy of these rapid tests improves, or is at least better characterized over time. SMH hopes to bring on additional methods of testing as they become available.

Testing performed in-house on the Cepheid and BioFire machines is unfortunately limited to select patients who are prioritized based on need for rapid results. Test kits for these platforms are allotted to hospitals nationally, so SMH has a limited number of kits to use based on our population and prevalence of disease. Collection supplies like swabs and viral media are also limited worldwide and nationwide, depending on the prevalence of disease; shortage of collection supplies was a major cause of lack of testing earlier in the pandemic and may be again this fall and winter.

Can anyone be tested in Sheridan?

At this time, yes, both symptomatic and asymptomatic individuals can be tested. The laboratory performing the test (and thus the cost to the patient and turnaround times) depends on clinical factors that are determined during the triage process of individual clinics and Sheridan Memorial's testing center.