



SARS-CoV-2 / COVID-19 Testing Methods

Michigan.gov/Coronavirus

Many questions regarding the applications and appropriateness of specific types of assays for COVID-19 testing have been asked. This brief note is intended to assist with understanding options and requirements surrounding each.

Each type of test is selected based upon which scientific questions and patient care outcomes it addresses. At this time, any test that is providing a diagnostic result for a patient **MUST** have FDA Emergency Use Authorization (EUA) approval or have met the stringent validation criteria provided by FDA. Tests are required to meet very specific national guidelines to perform this testing to ensure accuracy, ability to report properly, ability to follow-up on errors, the capability of performing quality control, and a host of other essential factors. The FDA website provides up to date lists of which assays are approved for diagnostic use. Visit www.fda.gov for further information.

Molecular – PCR: technically “quantitative real-time polymerase chain reaction.” This is currently the standard test for COVID-19 infection. This method looks for the presence of SARS-CoV-2 viral RNA present in the throat and back of nose, collected by “nasopharyngeal swab.” PCR tests most commonly provide fast throughput for large numbers of samples in a laboratory – from hundreds to thousands at a time.

There are rare false positives; if you test positive by PCR, you are very likely infected with COVID-19.

False negative results are possible: if the level of virus present is low due to infection very early or very late in the clinical course, low levels of virus present in nasopharyngeal swab may not be high enough to be detected by this method. If you have been infected with COVID-19 and have recovered, this method may give a negative result.

Serologic – antibody tests. These tests look for the presence of antibodies in a person’s blood – usually obtained by a “finger-poke” – against a viral protein. Unlike the molecular tests, tests for antibodies can detect those who have been infected and have now recovered. Serologic tests most commonly provide results for single samples at a time, intended for point of care applications.

Currently over 40 manufacturers have filed for FDA approval for point of care antibody tests. These tests are being offered for sale now, but *none* are currently FDA approved for routine clinical use.

Currently, there is not enough data on the antibody levels during the clinical course of COVID-19 infection to make conclusions on the clinical value of these tests.

It is Important to note at this time:

- These tests are investigative (experimental);
- These tests are not diagnostic;
- Clinical decisions should not be based on these tests alone;
- Negative serologic test results do not rule out possible COVID-19 infection;

- Positive results may be due to past or present infection with non-SARS-CoV2 coronavirus strains, as these are common cause of “cold” symptoms (may include coronavirus strains: HKU1, NL63, OC43, 222E).

Antigen Tests: these look for the presence of a molecule that is specific to the SARS-CoV2 coronavirus. For example, a protein that is present on the surface of the virus. Like molecular tests, antigen tests reveal the presence of the virus. Once the infection has resolved, the antigen disappears.

These tests are currently under development and may provide advantages over molecular tests when they become available.

It is important to determine if a test has received the appropriate FDA EUA. An intention to seek approval from FDA is not the same as having provided required minimum data regarding safety and risk of harm to a patient. Please ensure if an FDA EUA serology is selected that it is performed in the correct laboratory environment. Any test that does not have an approved FDA EUA must have a full validation performed and data provided to FDA. This results in the test being designated as a CLIA high complexity test. If a test is listed as high or moderate complexity it must be performed at a laboratory that meets all CLIA certification requirements. These types of test are NOT acceptable for providing a diagnostic result at any site that does not have the appropriate CLIA certification. A waived test may be performed at sites that have obtained a CLIA certificate of waiver. No testing should ever be performed without meeting minimum federal requirements. For further information please visit www.fda.gov or www.cms.gov, especially as it pertains to proper use of COVID-19 tests.