COVID-19 Testing Considerations

Each COVID-19 test has different performance characteristics and instructions for use. Tests should be used in accordance with the authorized labeling, and providers should be familiar with the tests’ performance characteristics and limitations. It is critical to carefully follow all the instructions for test use, specimen collection, storage, and transport. Failure to follow test instructions could jeopardize performance of the test and lead to false results.

There are several approaches to testing that college health professionals can consider when planning a testing strategy for their campus.

Diagnostic Testing

Diagnostic testing utilizes tests intended to detect current viral infection in persons suspected to have COVID-19. Both molecular and antigen tests are available to diagnose acute infection. Molecular (polymerase chain reaction or PCR) tests detect viral nucleic acids while antigen tests detect viral proteins in respiratory specimens (e.g., nasal swabs).

- Point-of-care (POC) tests are intended to be performed on-site in a clinic or other facility. Test results may be available at the testing site in less than an hour.
- Other tests must be sent to a laboratory for analysis, a process that may take several days.
- Molecular (PCR) tests remain the gold standard diagnostic test, with high sensitivity and near 100% specificity. Thus, the positive predictive value of a PCR test is high. Antigen tests are less sensitive and less specific but usually are cheaper and easier to run.
- Some tests with lower sensitivity (such as antigen tests) require confirmatory testing of negative results by a second test method (preferably a molecular test); refer to the package insert of the test being used.

Serologic Testing

Serologic (antibody) tests help determine whether a person was previously infected—even if the individual never showed symptoms. These tests detect antibodies in blood samples.

- An antibody test may not detect acute COVID-19 infection; it can take 1–3 weeks after infection for antibodies to be present.
- The U.S. Centers for Disease Control and Prevention (CDC) does not currently recommend using antibody testing as the sole basis for diagnosis of acute infection, and antibody tests are not authorized by the U.S. Food and Drug Administration (FDA) for such diagnostic purposes.
• In certain situations, serologic assays may be used to support clinical assessment in conjunction with viral detection tests (see CDC Interim Guidelines for COVID-19 Antibody Testing).
• There are other human coronaviruses that cause mild to moderate upper respiratory tract illnesses. COVID-19 antibody tests may cross-react with these seasonal coronaviruses that are circulating in the population, although antibody tests with FDA Emergency Use Authorization (EUA) have shown good specificity and minimal cross-reaction.
• The presence of antibody suggests short-term immunity, but long term or protective immunity is undetermined at this time.
• Serologic test results should not be used to make decisions about grouping persons residing in or being admitted to congregate settings, such as schools, dormitories, or correctional facilities [CDC]. Similarly, serologic test results should not be used to make decisions about returning persons to the workplace [CDC].

Self-Collected Tests

At-home collection COVID-19 tests are currently available for purchase. They have been authorized by the FDA under EUA to diagnose active COVID-19 infections. The patient fills out an intake survey that is meant to prioritize the test for those who may have been exposed, are experiencing symptoms, or are part of a high-risk population. Test collection kits are mailed to patients after approval by medical personnel. Respiratory specimens (i.e., nasal swabs) are collected at home and mailed to specific laboratories for testing. Patients may receive results directly from that laboratory or from the company.

Testing Priorities and Capacity

Symptomatic Testing

All colleges and universities should develop or enhance their capacity to offer diagnostic testing to students, faculty, and staff who need it. Prioritize testing of any person with symptoms of potential COVID-19 infection. Testing of ill persons should not be delayed; health centers should evaluate and test people with suspected illness as soon as possible.

Testing can be done on campus by health center staff or others, through local medical providers, or using local public health resources (community sites or similar).

Testing of Contacts

Testing is also recommended for all close contacts of persons diagnosed with COVID-19. Because of the potential for asymptomatic and/or pre-symptomatic transmission, it is important that contacts of individuals diagnosed with COVID-19 be quickly identified and tested.

In some settings, broader testing beyond close contacts is recommended as a part of a strategy to control transmission of SARS-CoV-2. Expanded testing might include testing of all people who were in proximity of an individual confirmed to have COVID-19 (e.g., those who shared communal spaces or bathrooms), or testing all individuals within a shared setting (e.g., testing all residents on a floor or an entire residence hall). Testing in these situations can be helpful because in high density settings it can be particularly challenging to accurately identify everyone who had close contact with an individual confirmed to have COVID-19. For example, students who do not know each other could potentially be close contacts if they are both in a shared communal space. Decisions about the level of risk and the scope of testing should be made in coordination with state, territorial, tribal, and local health officials.

All testing for COVID-19 must be coupled with high-intensity contact tracing, isolation, and quarantine, which will require close partnership between clinicians and local public health agencies.
Asymptomatic or Surveillance Testing

Testing asymptomatic individuals without known exposure to a person with COVID-19 (screening and surveillance): Testing of all students, faculty, and staff for COVID-19 before allowing campus entry (entry testing) has not been systematically studied. It is unknown if entry testing in IHEs provides any additional reduction in person-to-person transmission of the virus beyond what would be expected with implementation of other infection preventive measures (e.g., social distancing, face coverings, hand washing, enhanced cleaning and disinfection). Therefore, CDC does not recommend entry testing of all returning students, faculty, and staff. IHEs considering entry testing or similar mass screening programs should take into account the following:

- Acceptability of testing among students, their families, faculty, and staff.
- Availability of dedicated resources, cost, and the logistics needed to conduct broad testing.
- Turnaround time for test results. For screening to be effective as a public health strategy, results should be reported out within 1-3 days so that appropriate interventions (contact tracing, isolation, quarantine) can be made to control transmission.
- Limited usefulness of a single administration of testing. Single administration testing provides COVID-19 status for individuals only at that specific point in time and therefore could miss cases in the early stages of infection or subsequent exposures resulting in transmission.
- Aspects of the campus environment and culture that could contribute to either a lower or higher risk of COVID-19 cases developing, such as the degree to which students engage with and/or live within the community.

In areas with moderate to substantial community transmission and where resources allow, local health officials and IHEs may consider testing some or all asymptomatic students, faculty, and staff who have no known exposure (e.g., students in congregate housing such as residence halls) to identify outbreaks and inform control measures, as part of a surveillance program. Testing should be coordinated with state, territorial, tribal, and local health officials.

Some analytic modeling has suggested that testing of students, staff and faculty every two days, along with strict behavioral interventions, may effectively mitigate against an outbreak [Paltiel et al, 2020]. This frequent testing strategy would address the weaknesses of the single administration testing on entry or otherwise by detecting late converters and subsequent exposures. This strategy is resource intense and reliant on the acceptance of the campus community members to submit to a frequent testing schedule along with adherence to strict behavioral practices.

Testing of pooled samples can assist with conservation of reagents and may improve efficiencies. Pooled testing is typically cost effective only when used in populations with low expected prevalence.

Resources


