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CommonSpirit Health
COVID-19 Antigen Testing Guidelines
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There are three major types of COVID-19 tests. Nucleic acid amplification tests (NAAT), sometimes referred to as "molecular" tests, detect viral RNA and are useful for diagnosing acute infections. Antibody-based assays, sometimes referred to as "serology" tests, measure the host's humoral immune response to current or past infection and are useful for prevalence studies. The third type of test is antigen tests which are immunoassays that detect the presence of a specific viral antigen, and when positive indicate current viral infection.

Rapid antigen tests are commonly used in the diagnosis of respiratory pathogens, including influenza viruses and respiratory syncytial virus (RSV). Antigen tests are relatively inexpensive, return results quickly (e.g., 15 minutes) and can be used at the point of care (POC). However, antigen tests do not amplify their protein signal, so they are inherently less sensitive than NAAT/molecular tests. As a result, most antigen tests have a sensitivity of anywhere between 50 percent and 90 percent, far less than the 98 percent sensitivity associated with NAAT/molecular tests.[1]

The CDC recently released guidelines for the use of COVID-19 antigen tests.[2] The proper use and clinical performance of rapid antigen diagnostic tests largely depends on the clinical circumstances in which they are used. Rapid antigen tests are particularly helpful if the person tested is in the early stages of infection when the SARS-CoV-2 viral load is generally highest. They also may be informative in diagnostic testing situations in which the person has a known exposure to a confirmed case of COVID-19. There is limited data to guide the use of rapid antigen tests as screening assessments on asymptomatic persons, or to determine whether or not a previously confirmed case is still infectious.

The FDA has currently issued Emergency Use Authorizations (EUAs) for three COVID-19 rapid antigen tests: Quidel (Sofia), Becton Dickinson (BD Veritor) and LumiraDX.[3] These EUAs have been issued for each individual test with certain conditions of authorization required of the manufacturer and authorized laboratories. Laboratory and testing professionals who conduct diagnostic or screening testing for SARS-CoV-2 with rapid antigen tests must also comply with Clinical Laboratory Improvement Amendments (CLIA) regulations.

[1] https://www.sciencemag.org/news/2020/05/coronavirus-antigen-tests-quick-and-cheap-too-often-wrong#
[2] https://www.cdc.gov/coronavirus/2019-ncov/lab/resources/antigen-tests-guidelines.html
[3] https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/vitro-diagnostics-euas#individual-antigen

Current CommonSpirit Health COVID-19 Antigen Test Guidelines

Generally, NAAT/molecular tests are the preferred option for diagnosing ("ruling in") acute COVID-19 infections, especially in emergency departments (EDs) and acute care settings. It should be noted, however, that these tests are highly sensitive and might yield positive results very early in the infection before viral shedding is a concern. These tests might also be positive several weeks after the acute infection, when *noninfectious* nucleic acids might remain and precautions for an active virus are no longer required.

Since antigen tests are less sensitive, they might yield a negative result in the very early stages of the infection. Consequently, negative results should be followed up with either a NAAT/molecular test or repeat antigen testing. However, since antigen tests have a high correlation of positivity in symptomatic patients who are in the early phases of viral replication and shedding SARS-CoV-2 (which is generally within the first 5 days of symptoms), positive antigen tests results for symptomatic patients can be interpreted as presumptive for infection.

The following guidelines summarize our current recommendations for the use of COVID-19 antigen tests in the ambulatory setting. CDC also provides an antigen testing algorithm for nursing homes[4]:

1. Antigen testing should be considered only for symptomatic patients in the ambulatory setting, or patients with exposure to a confirmed case of COVID-19
    a. NAAT/molecular tests are generally more appropriate for ED and acute care inpatients
    b. NAAT/molecular tests are generally more appropriate for asymptomatic patients
2. Antigen testing of symptomatic patients in the ambulatory setting is particularly useful when NAAT/molecular testing:
    a. Has a high positivity rate in the community (e.g., greater than 10 percent)
    b. Is not available or has an unacceptably long turnaround time
3. If the test result of a symptomatic patient in the ambulatory setting is positive, then it may be interpreted as presumptive of an acute infection
4. If the test result of a symptomatic patient in the ambulatory setting is negative, then the patient should isolate at home pending elucidation of infection status if symptoms are mild, or present to an ED if symptoms are severe
    a. The infection status of the patient should be clarified by either
        i. NAAT/molecular test with the patient remaining in isolation pending the result
        ii. Repeat antigen test in 24 hours and if negative, repeat again in another 24 hours, with the patient remaining in isolation pending the results
    b. If the NAAT/molecular test or all three antigen tests (at 0, 24 and 48 hours) are negative, then the patient may be presumed to not be infected and may be released from isolation

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[4] https://www.cdc.gov/coronavirus/2019-ncov/hcp/nursing-homes-antigen-testing.html