



## **ADVISORY: Point of Care Antigen Test Use and Interpretation**

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<b>TO:</b>	Health Alert Network
<b>FROM:</b>	Rachel Levine, MD, Secretary of Health
<b>SUBJECT:</b>	<b>ADVISORY: Point of Care Antigen Test Use and Interpretation</b>
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**This transmission is a “Health Advisory” provides important information for a specific incident or situation; may not require immediate action.**

**HOSPITALS:** PLEASE SHARE WITH ALL MEDICAL, PEDIATRIC, NURSING AND LABORATORY STAFF IN YOUR HOSPITAL; **EMS COUNCILS:** PLEASE DISTRIBUTE AS APPROPRIATE; **FQHCs:** PLEASE DISTRIBUTE AS APPROPRIATE **LOCAL HEALTH JURISDICTIONS:** PLEASE DISTRIBUTE AS APPROPRIATE; **PROFESSIONAL ORGANIZATIONS:** PLEASE DISTRIBUTE TO YOUR MEMBERSHIP; **LONG-TERM CARE FACILITIES:** PLEASE SHARE WITH ALL MEDICAL, INFECTION CONTROL, AND NURSING STAFF IN YOUR FACILITY

- The availability and use of point of care (POC) antigen tests to detect SARS-CoV-2 is increasing.
- The main advantage of using these antigen tests is the rapid turnaround time for results; however, these tests are not as sensitive as molecular tests (i.e., PCR).
- Some sites may be new to using these POC tests and, in order to ensure accuracy of results, facilities conducting these tests should become familiar with good laboratory practices. Some laboratory best practices and suggestions for preventing errors are included in this message.
- Individuals using POC tests should understand antigen test performance characteristics in order to recognize potentially false negative or false positive results and to guide patient management.
- Assessment of the person being tested which would include the likelihood they have the disease or were exposed to COVID-19 should be considered when interpreting antigen test results and assessing the potential need for additional testing.
- The following message is being disseminated to address questions associated with antigen tests and assist with the use and interpretation of POC antigen tests.
- While some information contained in this HAN may be useful for long term care facilities, separate guidance for using antigen tests and the associated public health response in these facilities has been previously disseminated. **Long term care facilities using antigen tests should refer guidance disseminated in [HAN-526](#).**

The availability and use of antigen tests to detect SARS-CoV-2 is increasing. The main advantage of using these antigen tests is the rapid turnaround time for results; however, these tests are not as sensitive as molecular tests.

This guidance is designed to describe what an antigen test is and how it differs from PCR testing, some best practices for sites conducting these tests, when POC antigen testing should be considered, and circumstances that should be considered when interpreting antigen test results.

## **DESCRIPTION OF ANTIGEN TESTS**

PCR tests look for pieces of nucleic acid from SARS-CoV-2, the virus that causes COVID-19, in the nose, throat, or other areas in the respiratory tract. Antigen tests look for pieces of proteins that make up the SARS-CoV-2 virus. While both tests can be used to determine if a person has an active infection, antigen tests are less sensitive than PCR for detecting COVID-19 infections. The results of these antigen tests are impacted by pretest probability (i.e., the probability of a person having an infection before the test result is known) and need to be carefully interpreted.

Information on available antigen tests can be found at the following websites:

- <https://www.health.pa.gov/topics/disease/coronavirus/Pages/Guidance/Point-of-Care-Testing.aspx>
- <https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/vitro-diagnostics-euas#individual-antigen>

## **CONSIDERATION FOR USE OF ANTIGEN TESTS**

### Clinical Laboratory Improvement Amendments (CLIA) Certificate

Any entity utilizing Point-of-Care (POC) tests for COVID-19 must have a Pennsylvania laboratory permit and a CLIA Certificate. If you already have a Pennsylvania laboratory permit and CLIA Certificate, you must also ensure that COVID-19 is listed in your test menu. Please see [Understanding Clinical Laboratory Regulation in Pennsylvania](#) for more information. If you have questions about laboratory permits or CLIA certification, please notify [RA-DHPACLIA@pa.gov](mailto:RA-DHPACLIA@pa.gov) to assure laboratory compliance.

### Reporting

All entities conducting testing to identify SARS-CoV-2, the virus that causes COVID-19, are required to report positive, inconclusive/indeterminate, and negative results to PA-NEDSS within 24 hours. There are a number of mechanisms that have been established to ensure reporters can be compliant in providing the results of POC tests. Details on how to report to PA-NEDSS can be found in [HAN-531](#).

### Laboratory Best Practices and Preventing Errors

All testing for SARS-CoV-2, including rapid antigen testing, is directly impacted by the integrity of the specimen, which depends on specimen collection and handling. To reduce the potential for inaccurate results related to testing errors, implement the following:

- Ensure that users are properly trained to complete POC testing.
  - Maintain training records and ensure procedural compliance through routine auditing.
  - CDC provides materials on [good laboratory practice](#) and offers an online training with professional continuing education credits for their [Ready, Set, Test](#) training program.
- Follow manufacturer’s instructions for specimen collection, processing, storage, and handling of the specimen. Not following the manufacturer’s instructions can cause some swabs to have limited amounts of viral genetic or antigenic material for detection, leading to false negative results.
  - Antigen test manufacturers offer different training modalities for sites to familiarize themselves with the appropriate use of these products. Sites are encouraged to utilize these training opportunities and carefully review these materials prior to antigen test use.
- Wear appropriate PPE when collecting and handling specimens per [PA-HAN-524](#). It is critical that gloves are changed and hand hygiene is performed between each specimen collection and handling. Handling specimens without changing gloves or performing hand hygiene in between creates the potential for cross-contamination.
- Minimize delays between specimen collection and processing. Delays can affect the accuracy of the result.
- Conduct calibration of the machine, if applicable, and ensure positive and negative control procedures are performed as per manufacturer’s instructions. Carefully handle positive control solutions. Once control procedures are complete, clean and disinfect hands, work surfaces, and the instrument (if applicable) to assure the positive control does not contaminate clinical specimens.
- For batch testing methods, carefully plan a systematic approach to specimen receipt, labelling, rotation into the instrument (if applicable), removal, and recording the results. For each step of the process, the plan should address ways to minimize contamination and errors in results reporting, such as mixing up specimens from two individuals.

### Testing Considerations and Antigen Test Interpretation

The clinical performance of rapid antigen diagnostic tests largely depends on the circumstances in which they are used. Rapid antigen tests perform best when the person is suspected of having COVID-19 or they have been exposed to COVID-19 either individually (e.g., household or close contact) or as part of an outbreak/cluster. Symptomatic individuals should be tested in the early stages of infection with SARS-CoV-2 (i.e., typically within the first 5-7 days of symptoms onset) when viral load is generally highest. Testing of individuals with symptoms or with COVID-19 exposures is recommended to quickly identify COVID-19 infection, isolate these individuals, and identify/quarantine contacts. Use of antigen tests in symptomatic and exposed individuals correlates with a high pre-test probability which increases the likelihood of true positives but also increases the likelihood of false negatives. For this reason, additional molecular testing (i.e., PCR) should be considered in these patients with a negative result. Additional information about the interpretation of antigen results in these individuals can be found the section of [Table 1](#) which is outlined in **red** below.

While these tests can be performed in individuals who are asymptomatic or who have not been exposed, this can present challenges for test interpretation. Use of antigen tests in asymptomatic

and not exposed individuals correlates with a low pre-test probability which increases the likelihood of false positives but also increases the likelihood of true negatives. For this reason, additional molecular testing (i.e., PCR) should be considered in these patients with a positive result. Additional information about the interpretation of antigen results in these individuals can be found the section of [Table 1](#) which is outlined in **yellow** below.

Testing of asymptomatic and/or not exposed individuals using antigen tests should likely be reserved for closed congregate settings, such as a long-term care facility, correctional facilities and shelters, where early identification of COVID-19 introduction into these settings could limit further transmission. [HAN-526](#) details the use, interpretation and response to antigen tests in these long-term care settings. In other congregate care settings (e.g., correctional facilities, shelters), plans should be developed on how to best utilize this type of testing, how to obtain molecular testing when necessary and how best to respond to test results (e.g., cohort, isolate, exclude, quarantine). In addition to testing those who are symptomatic and/or exposed, testing clientele on admission or intermittent scheduled testing could be considered.

**TABLE 1- CONSIDERATIONS FOR ANTIGEN TEST RESULTS INTERPRETATION**

The following table was developed to assist partners with the interpretation of antigen tests which also considers additional laboratory results which may be available or the need to request additional laboratory testing. The table is divided into two sections which accounts for pre-test probability. The upper portion of the table (highlighted in the **red** section) assumes a higher pre-test probability whereas the lower portion of the table (highlighted in the **yellow** section) assumes a lower pre-test probability. While this table can be used as a guide, there may be additional circumstances (e.g., confidence in laboratory testing procedures, assessment of clinical picture, specimen collection practices, burden of COVID-19 in the surrounding community, etc.) that affect pre-test probability that should be considered and may alter the interpretation from the below table. Separate guidance ([HAN 526](#)) regarding the use of antigen testing in long term care facilities is available and should be used to guide actions in those settings. This table is subject to change as additional information about antigen testing is learned.

Antigen test results <sup>1</sup>	Subsequent PCR test result <sup>2</sup>	Does public health recommend PCR re-testing after antigen test?	Notes/Rationale
<b><i>The individual being tested was a close contact of a confirmed/probable case; or is associated with an ongoing outbreak; or is experiencing COVID-19 compatible symptoms<sup>3</sup>.</i></b>			
Positive	Not performed	No	Probable Case. Isolate/exclude <sup>4</sup> from work, no additional testing is recommended.
Positive	Positive	No	Confirmed Case. Isolate/exclude <sup>4</sup> from work, no additional testing is recommended
Positive	Single negative collected within 2 days of Ag test +	No	Probable Case. Isolate/exclude <sup>4</sup> from work, no additional testing is recommended.
Positive	Two negatives collected within 2 days after Ag test +	No	Probable Case. Isolate/exclude <sup>4</sup> from work, no additional testing is recommended. <sup>5</sup>

Negative	Positive	No	Confirmed Case. Isolate/exclude <sup>4</sup> from work, no additional testing is recommended
Negative	Negative	No	Not a Case. Explore other diagnoses as appropriate
Negative	Not performed	Consider PCR testing <sup>2</sup>	Isolate individuals until results of PCR are available. NOTE: Long term care facilities should consult <a href="#">CDC Guidance/HAN 526</a> regarding the need for re-testing.
Antigen test results <sup>1</sup>	Subsequent PCR test result <sup>2</sup>	Does public health recommend PCR re-testing after antigen test?	Notes/Rationale

***The individual being tested IS NOT a close contact of a confirmed/probable case; or associated with an ongoing outbreak; or experiencing COVID-19 compatible symptoms<sup>3</sup>.***

Positive	Not performed	Consider PCR testing if the suspicion of COVID is low (e.g., community activity is low/moderate <sup>6</sup> ); High community activity <sup>6</sup> – no additional testing.	<u>High community activity</u> : Probable Case. Isolate/exclude <sup>4</sup> from work, no additional testing is recommended. <u>Low/moderate community</u> : Probable Case unless PCR testing is conducted within 2 days and is negative <sup>2</sup> .
Positive	Positive	No	Confirmed Case. Isolate/exclude from work, no additional testing is recommended.
Positive	Single negative collected within 2 days of Ag test +	No	Not a Case.
Positive	Two negatives collected within 2 days after Ag test +	No	Not a Case.
Negative	Positive	No	Confirmed Case. Isolate/exclude <sup>4</sup> from work, no additional testing is recommended.
Negative	Negative	No	Not a Case.
Negative	Not performed	No	Not a Case.

1. Rapid antigen tests perform best when the person is tested in the early stages of infection with SARS-CoV-2 when viral load is generally highest.
2. When confirming an antigen test result with a RT-PCR test, it is important that the time interval between the two sample collections is less than 2 days, and there have not been any opportunities for new exposures between the two tests
3. COVID compatible symptoms are defined as: At least two of the following symptoms: fever (measured or subjective), chills, rigors, myalgia, headache, sore throat, nausea or vomiting, diarrhea, fatigue, congestion or runny nose **OR** Any one of the following symptoms: cough, shortness of breath, difficulty breathing, new olfactory disorder, new taste disorder **OR** Severe respiratory illness with at least one of the following: Clinical or radiographic evidence of pneumonia, Acute respiratory distress syndrome (ARDS).
4. [HAN-518](#) Interim Guidance on Discontinuing Non-Healthcare Isolation for Persons with COVID-19
5. For individuals who are considered probable cases, two negative PCR test results could clear the individual from isolation if criteria for [test-based strategy](#) is met.
6. Low/moderate COVID activity is defined as county having less than 10% positivity or incidence rate less than 100 per 100,000; high activity is defined as greater than or equal to 10% positivity or incidence rate greater than or equal to 100 per 100,000

## Resources

- PADOH Point of Care Testing
  - <https://www.health.pa.gov/topics/disease/coronavirus/Pages/Guidance/Point-of-Care-Testing.aspx>
- CDC Interim Guidance for Rapid Antigen Testing for SARS-CoV- 2
  - <https://www.cdc.gov/coronavirus/2019-ncov/lab/resources/antigen-tests-guidelines.html>
- CDC COVID-19 Guidance for Shared or Congregate Housing
  - <https://www.cdc.gov/coronavirus/2019-ncov/community/shared-congregate-house/guidance-shared-congregate-housing.html>
- CDC COVID-19 Guidance on Correctional and Detention Facilities
  - <https://www.cdc.gov/coronavirus/2019-ncov/community/correction-detention/index.html>

If you have questions about this guidance, please call your local health department or **1-877-PA-HEALTH (1-877-724-3258)**.

Categories of Health Alert messages:

**Health Alert:** conveys the highest level of importance; warrants immediate action or attention.

**Health Advisory:** provides important information for a specific incident or situation; may not require immediate action.

**Health Update:** provides updated information regarding an incident or situation; unlikely to require immediate action.

This information is current as of October 8, 2020 but may be modified in the future. We will continue to post updated information regarding the most common questions about this subject.