Clinical Laboratory COVID-19 Response Call
Monday, August 17th, 2020 at 3:00 PM EDT

- **Welcome**
  - Jasmine Chaitram, CDC Division of Laboratory Systems (DLS)

- **Antigen Testing—Video Update**
  - Reynolds (Ren) Salerno, CDC Division of Laboratory Systems (DLS)

- **New CDC FAQs**
  - Jasmine Chaitram, CDC Division of Laboratory Systems (DLS)

- **Review of Required Data Elements for Laboratory Reporting**
  - Sara Brenner, U.S. Department of Health and Human Services (HHS)

- **Status and Federal Procurement of Testing Supplies**
  - Tammy Beckham, U.S. Department of Health and Human Services (HHS)

- **FDA Update**
  - Tim Stenzel U.S. Food and Drug Administration (FDA)
The next call is scheduled for **Monday, August 31st** from 3:00 PM to 4:00 PM EDT.
CDC Information for Laboratories

• Interim Guidance for Collecting, Handling, and Testing Clinical Specimens

• Diagnostic Tools and Virus

• Emergency Preparedness for Laboratory Personnel
  https://emergency.cdc.gov/labissues/index.asp

• CDC’s Laboratory Outreach Communication System (LOCS)
  https://www.cdc.gov/csels/dls/locs/

• IVD Industry Connectivity Consortium
  https://ivdconnectivity.org/livd/

• LOINC In-Vitro Diagnostic (LIVD) Test Code Mapping for SARS-CoV-2 Tests
  https://www.cdc.gov/csels/dls/sars-cov-2-livd-codes.html
We Want to Hear From You!

Training and Workforce Development

Questions about education and training?
Contact LabTrainingNeeds@cdc.gov
To Ask a Question?

• **Using the Webinar System**
  ▪ Click the **Q&A** button in the Zoom webinar system
  ▪ Type your question in the **Q&A** box and submit it
  ▪ Please do not submit a question using the chat button

• For media questions, please contact CDC Media Relations at [media@cdc.gov](mailto:media@cdc.gov)

• If you are a patient, please direct any questions to your healthcare provider
Antigen Testing—Video Update

Reynolds (Ren) Salerno

CDC Division of Laboratory Systems (DLS)
## Testing Strategies for SARS-CoV-2

<table>
<thead>
<tr>
<th></th>
<th>Diagnostic</th>
<th>Screening</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptomatic or Known or Suspected Exposure</td>
<td>Yes</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>Asymptomatic without Known or Suspected Exposure</td>
<td>No</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Characterize <strong>Incidence</strong> and <strong>Prevalence</strong> in the Community</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
</tr>
</tbody>
</table>
## Regulatory Requirements

<table>
<thead>
<tr>
<th></th>
<th>Diagnostic</th>
<th>Screening</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testing can be Performed in a <strong>CLIA-certified Laboratory</strong> or Testing Site</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Testing can be Performed in a <strong>Non-CLIA-Certified Laboratory</strong> or Testing Site</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Test System Must be <strong>FDA Authorized</strong> or be Offered under the Policies in FDA’s Guidance</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Interim Guidance for Rapid Antigen Testing for SARS-CoV-2

Intended for:

1. Clinicians
   • **Order** antigen tests
   • **Receive** antigen results
   • **Perform** point-of-care testing

2. Laboratory professionals
   • **Perform** antigen testing in a laboratory setting and report results
   • **Perform** antigen testing at the point of care and report results
Rapid Antigen Testing for SAR-CoV-2

Rapid antigen tests

• Immunoassays that detect the presence of a specific viral antigen, which implies current viral infection.
• Currently authorized to be performed on nasopharyngeal or nasal swab specimens placed directly into the assay’s extraction buffer or reagent.
• Relatively inexpensive, can be used at the point-of-care, and can return results in approximately 15 minutes.
Current FDA-Authorized Antigen Tests

• Instructions for Use: intended for “individuals who are suspected of COVID-19 by their healthcare provider within the first five days of the onset of symptoms”

• Sensitivity of 84% and 97% compared to RT-PCR
  – May cause the test to return a negative result, while a more sensitive test, such as RT-PCR, may return a positive result
  – Reporting negative results differ depending on the device

• Specificity of 100% compared to RT-PCR
  – False positive results are unlikely
  – Positive test results can be reported as positives
# Pretest Probability and Likelihood of Positive and Negative Predictive Values

<table>
<thead>
<tr>
<th>Pretest Probability*</th>
<th>Negative Predictive Value**</th>
<th>Positive Predictive Value**</th>
<th>Impact on Test Results</th>
</tr>
</thead>
</table>
| Low                  | High                       | Low                        | Increased likelihood of **False Positives**  
Increased likelihood of **True Negatives**  |
| High                 | Low                        | High                       | Increased likelihood of **True Positives**  
Increased likelihood of **False Negatives**  |

*Sensitivity and specificity of tests are generally stable and not affected by pretest probability.

**Predictive values are affected by pretest probability.
“Gold Standard” for Clinical Diagnostic Detection of SARS-CoV-2 Remains RT-PCR

• It may be necessary to confirm a rapid antigen test result with a nucleic acid test, especially if the result of the antigen test is inconsistent with the pretest probability (infection prevalence and clinical context).

• 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 two days, and there have not been any opportunities for new exposures between the two tests.

• If more than two days separates the two tests, or there have been opportunities for new exposures between the two tests, the RT-PCR test should be considered a separate test – not a confirmatory test.

• If RT-PCR testing is not available, clinical discretion can be used in whether to recommend the patient isolate.
Improper specimen collection may cause some swabs to have limited amounts of viral genetic or antigenic material for detection.

Inadequate quality assurance procedures could result in cross contamination of the specimen, which could cause inaccurate test results, and exposure to the staff.

Delays from sample collection to testing should be minimized.

Biosafety measures and instructions for use should be followed precisely to ensure accurate testing and safety of those who perform the testing.
Evaluating the Results of Antigen Testing for SARS-CoV-2

What to consider

1. Performance characteristics (e.g. sensitivity, specificity), instructions for use of the FDA-authorized assay

2. Prevalence of COVID-19 in that particular community (positivity rate over the previous 7–10 days or cases per population)

3. Clinical and epidemiological context of the person who has been tested
**Reporting Rapid Antigen Test Results for SARS-CoV-2 to Health Departments and Patients**

<table>
<thead>
<tr>
<th></th>
<th>Diagnostic</th>
<th>Screening</th>
<th>Surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returned to <strong>Individuals</strong> and <strong>Healthcare Providers</strong> for clinical decision making</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Returned in Aggregate to Requesting Institution</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Reported to <strong>Local, State, Territorial, or Tribal Health Department</strong> according to the CARES Act</td>
<td>Yes</td>
<td>Yes</td>
<td>Only if requested; must be in aggregate</td>
</tr>
</tbody>
</table>
Available on the CDC COVID-19 Laboratory Website

Visit the CDC COVID-19 Laboratory Website and click the Using Antigen Tests tab.
For more information, contact CDC
1-800-CDC-INFO (232-4636)

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of Centers for Disease Control and Prevention.
New COVID-19 Resources for Laboratories


- New Additions to the Frequently Asked Question (FAQs) about COVID-19 for Laboratories
New CDC FAQs

Jasmine Chaitram
CDC Division of Laboratory Systems (DLS)
Lab Data Reporting Update

August 17, 2020

Sara Brenner, MD, MPH

COVID-19 National Response Operations: HHS Data Strategy and Execution Workgroup (DSEW)

Associate Director for Medical Affairs; Chief Medical Officer for In Vitro Diagnostics

Office of In Vitro Diagnostics & Radiological Health (OIR)

Center for Devices & Radiological Health (CDRH)

U.S. Food & Drug Administration

FOUO – For Official Use Only
Background

HHS COVID-19 Laboratory Data Reporting Guidance – June 4, 2020

- Under CARES Act 116-136, § 18115(a)
- Applies to all testing performed in CLIA labs and home use settings
- Outlines the data elements for COVID-19 test data submission to HHS
- Implementation deadline: August 1, 2020
- References SHIELD COVID-19 test mapping (*published by CDC*)
  https://www.cdc.gov/csels/dls/sars-cov-2-livd-codes.html

Additional Implementation Guidance – July 31, 2020

- FAQs https://www.hhs.gov/answers/is-additional-information-including-technical-specifications-available-to-support-laboratories-with-implementation/index.html
- HL7 V2 Messaging
  https://confluence.hl7.org/display/OO/Proposed+HHS+ELR+Submission+Guidance+using+HL7+v2+Messages
HHS COVID-19 Laboratory Reporting Guidance

• Helps assure a rapid and thorough public health response to the COVID-19 pandemic
• Enables the ability to maximize the utility of Real-World Evidence (RWE)
• Contributes to understanding disease incidence and trends
  ▪ real-time epidemiology,
  ▪ contact tracing,
  ▪ inform distribution of testing resources and other COVID-19 supply chains
• Empowers patients with:
  ▪ access to personalized test results and guidance
  ▪ Knowledge to take action to protect themselves, their families, and their communities.
Reportable Data Elements for All COVID-19 Tests
(summary; reportable to federal/state/local authorities, as appropriate)

Test orders:
- Test ordered
- Ordering provider name & NPI
- Ordering provider location/contact

Test results:
- Test result
- Device Identifier
- Specimen source
- Date specimen collected
- Test Result date
- Accession #/Specimen ID
- Performing facility name/CLIA#
- Performing facility location

Patient Demographics:
- Unique patient identifier
- Patient name
- Patient date of birth/age
- Patient race
- Patient ethnicity
- Patient sex
- Patient location/contact
- Patient occupation
- Patient congregate care/living setting
- Patient symptoms
- Patient test & hospitalization history
- Patient pregnancy status

Harmonization Tools
HHS COVID-19 Guide:

COVID-19 Test Code Mapping:
<table>
<thead>
<tr>
<th>#</th>
<th>Data Element</th>
<th>Reporting Requirement</th>
<th>Ordering Provider</th>
<th>Notes</th>
<th>Example</th>
<th>HL7 Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Test ordered</td>
<td>Yes</td>
<td>Yes</td>
<td>Requested</td>
<td>Test ordered by provider. Use LOINC panel codes and general LOINC codes for individual tests for orders Example: LOINC: 24531-1; SARS coronavirus 2 RNA panel - Respiratory specimen by NAA with probe detection</td>
<td>OBR-4</td>
</tr>
<tr>
<td>2</td>
<td>Test result (performed)</td>
<td>Yes</td>
<td>Yes</td>
<td>Requested</td>
<td>Test conducted by lab Example: LOINC: 24640-6; SARS coronavirus 2 S gene (Presence) in Respiratory specimen by NAA with probe detection</td>
<td>OBR-3</td>
</tr>
<tr>
<td>3</td>
<td>Test result (values)</td>
<td></td>
<td></td>
<td>Qualitative tests: Must use harmonized SNOMED-CT value set codes</td>
<td>Example: SNOMED-CT Values: 260373001 Detected 26041500 Not detected 89523108 Not detected in pooled specimen # of specimens pooled 419884000 Inconclusive Example: Quantitative Value: 200 mg/mL IgG</td>
<td>OBR-5</td>
</tr>
<tr>
<td>4</td>
<td>Test result date</td>
<td>Yes</td>
<td>Yes</td>
<td>Requested</td>
<td>Date the test result was obtained Example: 20200716</td>
<td>OBX-11</td>
</tr>
<tr>
<td>5</td>
<td>Test report date</td>
<td>Yes</td>
<td>Yes</td>
<td>Requested</td>
<td>Date the test result was reported to the provider/patient Example: 20200716</td>
<td>OBX-22</td>
</tr>
<tr>
<td>6</td>
<td>Test ordered date</td>
<td>Yes</td>
<td>Yes</td>
<td>Requested</td>
<td>Date the test result was ordered Example: 20200716</td>
<td>ORC-15</td>
</tr>
<tr>
<td>7</td>
<td>Specimen collected date</td>
<td>Yes</td>
<td>Yes</td>
<td>Requested</td>
<td>Date the specimen was collected Example: 20200716</td>
<td>OBR-71</td>
</tr>
<tr>
<td>8</td>
<td>Device Identifier</td>
<td>Yes</td>
<td>Yes</td>
<td>Requested</td>
<td>Must use harmonized Device Identifiers (DI), when available. The DI is contained Example: DI: 012345-67891011</td>
<td>OBX-17</td>
</tr>
</tbody>
</table>

Device Identifier (DI)
(part of the Unique Device Identifier)

How can you report a DI?
• There are 2 appropriate options:
  o Use the DI of the UDI (preferred; e.g., 01234567891011)
  o Use the TradeName_Company (e.g., XpertXpressSARS-CoV-2_Cepheid)

Where can a lab obtain a DI?
From the manufacturer. If a lab does not have a DI for a specific device, we recommend that the lab reach out to the device manufacturer to obtain the DI. If the manufacturer does not yet have a DI and needs assistance, support is available at SHIELD-LabCodes@fda.hhs.gov to help them navigate through the process.

How can a manufacturer obtain a DI?
A manufacturer can obtain a UDI-DI through one of the 3 issuing agencies approved for generating a UDI, listed here:
https://www.fda.gov/medical-devices/unique-device-identification-system-udi-system/contact-fda-accredited-issuing-agency
Scenarios for Reporting Device Identifiers

**Manufactured IVD**

- **Closed/Contained**
  - Self-Contained (Lateral Flow)

- **On-Label Open Platform**
  - On-Label Open Platform (RT-PCR Thermocycler)

- **Mix/Match**
  - Closed Platform (Cartridge-Fed RT-PCR Thermocycler)
  - GMP Reagents (RT-PCR reagents for open platform)

**Lab Developed IVD**

- **Off-Label Open Platform**
  - Off-Label Open Platform (RT-PCR Thermocycler)

- **On-Label Open Platform**
  - Open Platform (RT-PCR Thermocycler)
  - GMP Reagents (RT-PCR reagents for open platform)
  - LDT Reagents (RT-PCR reagents for open platform)
Scenarios for Reporting Device Identifiers

**Manufactured IVD**
- Closed/Contained
- On-Label
- Open Platform

- Test Kit ID
- Instrument ID

**Lab Developed IVD**
- Off-Label
- Mix/Match
- On-Label
- Open Platform

- Test Kit ID
- Instrument ID

**Examples**
- Test Kit ID
- Instrument ID
- Test Kit ID
<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Vendor Analyte Name</th>
<th>Vendor Specimen Description</th>
<th>Vendor Result Description</th>
<th>LOINC Code</th>
<th>LOINC Long Name</th>
<th>LOINC Order Code</th>
<th>Testkit Name ID</th>
<th>Equipment UID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roche</td>
<td>cobas® 8800/8800 Systems</td>
<td>cobas® SARS-CoV-2</td>
<td>nasopharyngeal (NP) swabs (25S650001)<em>Nasopharyngeal swab</em>SCT oropharyngeal (OP) swabs (25S6529004)<em>Throat swab</em>SCT</td>
<td>SARS-CoV-2 RNA is Detected (260373001)<em>Detected</em>SCT SARS-CoV-2 RNA is Presumptive Positive (720735008)<em>Presumptive positive</em>SCT SARS-CoV-2 RNA is Not Detected (260415000)<em>Not detected</em>SCT Invalid Result (455371000124106)<em>Invalid result</em>SCT or 125154007<em>Specimen unsatisfactory for evaluation</em>SCT</td>
<td>94500-6</td>
<td>SARS coronavirus 2 RNA [Presence] in Respiratory specimen by NAA with probe detection</td>
<td>94500-6</td>
<td>cobas® SARS-CoV-2_Roche</td>
<td>00430213040203</td>
</tr>
<tr>
<td>Abbott</td>
<td>ID NOW</td>
<td>COVID-19</td>
<td>nasal swab (445297001)<em>Swab of internal nose</em>SCT nasopharyngeal swab (25S650001)<em>Nasopharyngeal swab</em>SCT throat swabs (25S6529004)<em>Throat swab</em>SCT Nasal and throat swab combination (433801000124107)<em>Nasopharyngeal and oropharyngeal swab</em>SCT</td>
<td>Positive (260373001)<em>Detected</em>SCT Negative (260415000)<em>Not detected</em>SCT Invalid result (455371000124106)<em>Invalid result</em>SCT</td>
<td>94534-5</td>
<td>SARS coronavirus 2 RdRp gene [Presence] in Respiratory specimen by NAA with probe detection</td>
<td>94534-5</td>
<td>10811877011269</td>
<td>10811877011269</td>
</tr>
<tr>
<td>Mesa Biotech</td>
<td>Accula SARS-CoV-2 Test® Interpretation</td>
<td>SARS-CoV-2</td>
<td>nasal swab (445297001)<em>Swab of internal nose</em>SCT</td>
<td>Positive Test for SARS-CoV-2 (260373001)<em>Detected</em>SCT Negative Test for SARS-CoV-2 (260415000)<em>Not detected</em>SCT Invalid Result (455371000124106)<em>Invalid result</em>SCT or 125154007<em>Specimen unsatisfactory for evaluation</em>SCT</td>
<td>95409-9</td>
<td>SARS-CoV-2 (COVID-19) N gene [Presence] in Nose by NAA with probe detection</td>
<td>95431-1</td>
<td>Accula SARS-CoV-2 Test®</td>
<td>8540COV41000</td>
</tr>
</tbody>
</table>
Total # Labs = 266,516 (March 2020)

CLIA LABORATORIES
BY CLIA CERTIFICATE TYPE
(NON-EXEMPT ONLY)

- Waiver: 75%
- Provider Performed Microscopy: 12%
- Accreditation: 6%
- Compliance: 7%
Frequently Asked Questions

Of 239 inquires, the majority came from clinical laboratories regarding how to report test data to local, state, and federal entities.

Common questions:
- How to report test data/results?
- How to report to an entity/HHS Protect?
- Clarification at Ask At Order Entry (AOE)

*academic labs, commercial labs, health departments, professional orgs, private sector, etc.*
THANK YOU FOR BEING PART OF THE SOLUTION!
Status and Federal Procurement of Testing Supplies

Tammy Beckham
U.S. Department of Health and Human Services (HHS)
FDA Update

Tim Stenzel
U.S. Food and Drug Administration (FDA)
Food and Drug Administration (FDA)

- COVID-19 Emergency Use Authorization (EUA) Information for Medical Devices
  https://www.fda.gov/medical-devices/emergency-situations-medical-devices/emergency-use-authorizations

- COVID-19 In Vitro Diagnostic EUAs

- COVID-19 Frequently Asked Questions

- COVID-19 Updates

- FDA Townhall Meetings

- Independent Evaluations of COVID-19 Serological Tests
  https://open.fda.gov/apis/device/covid19serology/
Food and Drug Administration (FDA)

COVID-19 Diagnostic Development: CDRH-EUA-Templates@fda.hhs.gov

Spot Shortages of Testing Supplies: 24-Hour Support Available

1. Call 1-888-INFO-FDA (1-888-463-6332)
2. Then press star (*)
Thank You For Your Time!

Photo submitted by the Microbiology Laboratory at The University of Pittsburgh Medical Center