Nebraska Medicine Covid-19 Testing Recommendations

Clinical Presentation: The initial symptoms of COVID-19 are generally mild and characterized most commonly by fever (43-98%), cough (68-82%), and shortness of breath (19-55%). Other symptoms may also be present early in the illness such as headache (3-10%), myalgias (11-15%), sore throat (5-14%), and GI upset (nausea, vomiting, diarrhea 1-10%). Rhinorrhea (4-6%) and nasal congestion alone are relatively uncommon as opposed to many other respiratory viruses and seasonal allergies. Most persons infected with COVID-19 who are young and healthy will recover without problems. Those who are older or immunocompromised are more likely to progress to pneumonia which can be severe.

Testing Recommendations: Test availability is improving but not unlimited and should be prioritized to those where it will have the greatest impact in care. Testing should be reserved for those who have symptoms typical of COVID-19 (cough, fever, shortness of breath), those with severe symptoms, or those with a combination of the symptoms listed above. Asymptomatic persons should not be tested, although there are certain situations where screening for COVID-19 may be appropriate. Those with mild upper respiratory symptoms should generally not undergo testing unless they meet one of the criteria below. Infection Control does not need to be contacted to discuss testing. We recommend testing be utilized in the following way:

1. **TEST** → Hospitalized patients who have respiratory symptoms which could be compatible with COVID-19
   - Differentiating pneumonia due to COVID-19 from other forms of pneumonia can be difficult. See information below on differentiating types of pneumonia. If presentation is consistent with possible COVID-19, we recommended testing. Other respiratory testing (viral panels, culture, etc.) could also be obtained if appropriate.

2. **TEST** → Healthcare workers, including healthcare students, with symptoms. Because of their extensive and close contact with vulnerable patients in healthcare settings, even mild signs and symptoms of COVID-19 should be evaluated among potentially exposed healthcare personnel. Testing directed by Employee Health or Student Health should be performed as directed.

3. **TEST** → Ambulatory symptomatic patents at increased risk for poor outcomes or who work in high risk environments. Not all patients in this group need testing and it should generally be reserved for where it will provide clinical utility. This group includes:
   - Older adults (age ≥ 65 years)
   - Those who are immunocompromised or have chronic medical conditions (e.g., diabetes, chronic lung, heart, or kidney disease)
   - Long-term care facility residents or those who reside in other group settings (homeless shelter, group home, etc.)

4. **TESTING NOT GENERALLY RECOMMENDED** → Ambulatory symptomatic but otherwise healthy persons. Alternative testing such as rapid influenza testing or respiratory pathogen panels are not routinely recommended but could be considered if they will assist in care. Rarely there may be reasons to test symptomatic but otherwise healthy ambulatory patients (care for elderly or immunocompromised person, etc.)
   - Patients without another explanation for their symptoms, particularly if they have traveled, been exposed to someone with COVID-19, or have symptoms generally consistent with COVID-19 should be considered to have been infected and are recommended to isolate at home until they meet criteria for leaving home isolation.

Updated 3/31/20
Directing COVID-19 Testing in Patients with Pneumonia: Differentiation of patients with COVID-19 infection from those with bacterial pneumonia can be difficult. The guidance below is provided to assist in deciding if a patient warrants COVID-19 testing. Patients with syndromes highly consistent with bacterial infection are unlikely to need COVID-19 testing while those presenting with an “atypical pneumonia” with features concerning for COVID-19 should always be placed in appropriate isolation and tested.

<table>
<thead>
<tr>
<th></th>
<th>COVID-19</th>
<th>Bacterial Pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms</td>
<td>Fever, Cough, Shortness of Breath, Viral prodrome (headache, myalgias, nausea/vomiting/diarrhea)</td>
<td>Fever, Cough, Shortness of Breath, Purulent sputum</td>
</tr>
<tr>
<td>Lab Abnormalities</td>
<td>Normal/low WBC, Lymphopenia common Mild hepatitis</td>
<td>Leukocytosis, bandemia</td>
</tr>
<tr>
<td>Procalcitonin</td>
<td>Usually low</td>
<td>Elevated</td>
</tr>
<tr>
<td>Exposure</td>
<td>Travel Close contact with confirmed or suspected case of COVID-19</td>
<td>None</td>
</tr>
<tr>
<td>Imaging</td>
<td>Bilateral infiltrates, “atypical pneumonia” Multifocal ground-glass opacities</td>
<td>Lobar Infiltrate</td>
</tr>
<tr>
<td>Treatment</td>
<td>Supportive Care Airborne, contact, droplet Isolation</td>
<td>Antibiotic Therapy Precautions per etiology</td>
</tr>
</tbody>
</table>

Testing Protocol: The decision to perform a Respiratory Pathogen Panel (RPP) should be individualized. An RPP does not need to be obtained before COVID-19 testing but may be useful in those presenting with atypical pneumonia.

- Testing will be performed using a single nasopharyngeal specimen. Oropharyngeal specimen collection is not recommended. An RPP can be run on the same swab as the COVID-19 test. Instruction on specimen collection are available on the Nebraska Now Page ([https://now.nebraskamed.com/infectious-diseases-protocols/](https://now.nebraskamed.com/infectious-diseases-protocols/))
- Patients with pneumonia should undergo testing of sputum or of other lower respiratory tract specimens if available. Sputum induction and other aerosol generating procedures should be avoided.
- Outpatients who were tested early in their illness and then present with worsening of symptoms should be retested as false negatives have occurred early in illness

Ordering COVID-19 Testing:

- COVID-19 testing is available in EPIC under the order COV19, see below for ordering instructions.
  - One Chart Test Name: LAB6400; COVID-19 by PCR
  - Sunquest LIS Test Name: Code is COV19, name in Sunquest is COVID 19 BY PCR
    Alternate Test Name: Synonyms: COV19, Coronavirus, COVID19

Updated 3/31/20
One Chart Test Code: COV19

- In most cases, testing will be performed on the Roche Cobas 6800 platform. However, in certain circumstances, other samples will be tested using our laboratory developed test (NECoV19). In these instances, the COV19 test will be cancelled by the laboratory and the NECOV test will be ordered and reported. In our brief experience, the positive and negative percent agreement between these two assays is 100%.
- Clinicians should answer any necessary questions when ordering the assay to accurately reflect their reason for testing.
- When testing is ordered on inpatients please include the associated isolation order (airborne, contact/droplet).
- When the test is ordered a flag for “COVID Rule Out” will be automatically added to the patient’s chart.
  - The exception to this is the pre-procedural screening (see information below) where a “COVID-19 Procedure Screening” flag will be added.
- If the test is positive an infection flag for “COVID-19” will be automatically added to the patient’s chart.

Interpreting COVID Testing Results: Two assays are currently being used to test for COVID-19. Results are slightly different between the tests and interpretation recommendations are below.

Roche Cobas 6800 (COV19) interpretation
- This assay is designed to detect RNA from two genes within SARS CoV 2, the E gene and the ORF1a-gene.
- If both the E-and ORF1a-genes RNA are not detected, the following will be resulted: Not Detected - SARS CoV2 RNA NOT DETECTED by RT-PCR.
- If both the E-and ORF1a-genes RNA are detected, or ORF1a-/E-RNA alone, the following will be resulted: Detected - SARS CoV2 RNA DETECTED by RT-PCR.
- In rare cases, the sample will fail internal controls and the result will be Inconclusive. In this situation, we suggest recollection of the sample if clinically indicated.

Laboratory developed test (NECoV19) interpretation
- This assay is designed to detect RNA from two genes within SARS CoV 2, the E gene and the N-gene
- If the E-gene RNA is not detected, the following will be resulted: Not Detected - SARS CoV2 E gene RNA NOT DETECTED by RT-PCR.
- If the E-gene RNA is detected, the same sample will be re-tested on the next run for both the E-gene RNA plus a separate N-gene target to confirm if it is positive. If either or both the E- or N-target RNA is detected upon retesting, the following will be resulted: Detected - SARS CoV2 E gene RNA DETECTED by RT-PCR.
- However, if neither the E- or N-gene RNA is detected upon retesting, a result of inconclusive is reported as follows: Inconclusive result - Please contact Microbiology director for further consultation at 402-888-5626

How to Manage Inconclusive Results: Inconclusive result most probably reflect low levels of virus in the sample but may also represent a false positive result. We recommend the following:

Updated 3/31/20
• For inpatients who have an initial inconclusive result on a NP swab, we recommended a new respiratory tract sample be obtained 24 hours after the first sample. If possible, a lower respiratory tract specimen (sputum, tracheal aspirate, etc.) should be obtained, particularly in those with evidence of pneumonia.
  o If the new test is positive or inconclusive, the patient should be considered positive for COVID-19.
  o If the new test is negative, the need for additional testing depends on the suspicion of disease.
    ▪ If suspicion is low, consider negative for COVID-19.
    ▪ If suspicion is high (atypical pneumonia, high risk exposure, etc.), consider third test, again preferentially of lower tract secretions if possible.
    ▪ Discussions with infection control are appropriate to decide if additional testing is needed in cases where results are difficult to interpret. Please contact 888-4646 to discuss.

• For outpatients who have an inconclusive result, per consultation with public health authorities, a second swab should be collected 24 hours after the first swab was obtained and re-tested.
  o If the second test is negative, the patient will be considered as negative for COVID.
  o If the second test is positive, the patient will be considered positive for COVID and a public health investigation will be opened.
  o If the second test remains inconclusive, interpretation is difficult. This may indicate presence of low-level viral RNA or be falsely positive. Out of an abundance of caution, the patient should be advised to continue home isolation similar to a patient with a positive result (10 days from symptom onset and at least 5 days of fever free without antipyretics and improving respiratory symptoms). If symptoms were to progress or worsen, obtaining additional specimens for repeat testing may be considered.

**Ruling Out COVID-19:**

• Outpatients with a single negative screen for COVID-19 will be generally considered ruled out. Inconclusive results should be interpreted as above. If symptoms worsen or pneumonia develops, retesting should be strongly considered. Those on a 14-day home quarantine due to high risk exposure should continue to remain isolated.

• Inpatients may require two or more tests to rule out infection depending on clinical presentation. Those at low risk (no known exposure, alternative diagnosis more likely) will generally be considered ruled out after a single negative test. Those with a high-risk presentation (viral pneumonia, high risk exposure, etc.) will require 2 negative tests to be ruled out.

• Inpatients who have tested positive for COVID-19 will need testing to have isolation removed unless they have been discharged. If discharged, a COVID-19 positive patient should follow the outpatient guidance on when they can exit home isolation. Patients who remain in the hospital will need to be tested to confirm that their infection has resolved. This should only be performed in those who are at least 10 days from symptom onset and who have been improving for at least 5 days (5 days of fever free without antipyretics and improving respiratory symptoms). Two negative tests at least 24 hours apart are required to remove a patient from isolation.
• Removing patients from COVID-19 isolation should be individualized and always based on discussion with Infection Control (888-4646) and/or COVID ID physician. The Infection Control Department is ultimately responsible for removing the isolation flag.

Screening for COVID-19 in Asymptomatic Patients:

• Screening for infection in asymptomatic patients is NOT generally recommended.
• In certain high-risk situations it is acceptable such as before high risk surgical procedures or pre-bone marrow or organ transplant. (link to perioperative guidelines)
  o Pre-procedural testing should be generally arranged in the outpatient setting 48-72 before the procedure and be done according to currently available guidelines
  o Testing in bone marrow and organ transplant should be directed by ID experts in those areas
• Pre-procedural testing should be ordered using the Pre-Procedural order panel