

Collecting and Handling Laboratory Specimens from Nebraska Patients with Suspected COVID-19 Infection

Introduction

Healthcare Personnel (HCPs) who collect, handle, transport or test any clinical specimens from a patient under investigation (PUI) for Corona Virus Disease (COVID-19) should adhere rigorously to the following precaution measures and biosafety practices listed in <https://www.cdc.gov/coronavirus/2019-nCoV/hcp/clinical-criteria.html>. HCPs should be prepared to:

- ✓ **Identify** patients in accordance to the CDC Case definition: <https://www.cdc.gov/coronavirus/2019-nCoV/hcp/clinical-criteria.html>
- ✓ **Isolate** patients by placing a facemask on the patient and isolate in an examination room with the door closed. It is recommended patients be isolated in an Airborne Infection Isolation Room (AIIR) or if not available, placed in room where the exhaust is not recirculated within the building without HEPA filtration.
- ✓ **Inform** both in-house infection prevention (IP) personnel and the local health department (LHD). (<http://www.dhhs.ne.gov/Pages/LHD>) if COVID-19 is suspected prior to specimen collection. If warranted, testing at NPHL will need prior approval.
- ✓ **Initiate** collection of specimens use appropriate Personal Protective Equipment (PPE) for respiratory pathogens.

Respiratory Specimen Collection

Maintain proper infection control (<https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html#a4>) when collecting specimens. Use appropriate PPE-following standard, contact, airborne precautions and eye protection (i.e., eye protection such as goggles and/or disposable face shield, masks-preferably N-95sor PAPRs, a long-sleeved gown, and gloves).

Provided NPHL confirmation tests for COVID-19 have been approved, collect one (1) Nasopharyngeal (NP) swab AND one (1) oropharyngeal swab (NP/OP). Multiplex PCR analysis is recommended if facility's on-site laboratory can safely perform. Use only synthetic fiber swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden shafts, as they may contain substances that inactivate some viruses and inhibit PCR testing.

Nasopharyngeal

- ✓ Collect an additional NP swab if other testing is ordered within the facility's lab, such as the multiplex Respiratory Pathogen Panel.
- ✓ Use only synthetic fiber swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden shafts, as they may contain substances that inactivate some viruses and inhibit PCR testing.
- ✓ Nasopharyngeal swab: HCP should stand to side, not directly in front of patient to avoid aerosols. Insert a swab into the nostril parallel to the palate. Gently hold, then rotate swab to absorb secretions. Slowly withdraw the swab. Do not sample the nostrils or tonsils.

Oropharyngeal

- ✓ Oropharyngeal swab (e.g., throat swab): Insert swab into the posterior pharynx and tonsillar areas. Rub swab over both tonsillar pillars and posterior oropharynx. Avoid touching the tongue, teeth, and gums.

Place each swab immediately into a sterile tube containing 2-3 ml of viral transport media. NP and OP specimens should be kept in separate vials. Aseptically cut swab stick off to permit tightening of the cap. If swab has break line, cover vial opening with gauze and hold away from all HCPs and patient to break swab handle off. Tighten cap on vial and parafilm or tape around top to secure cap.

Place patient's label on the specimen container (i.e., primary container) only after name has been confirmed with patient ID and after specimen has been collected. Label must contain first and last name, date of birth, time and date of collection, specific source (NP or OP) and collector initials.

Lower Respiratory

- ✓ Consult with infectious diseases/infection control if other specimen types such as sputum can be safely collected for in-house testing. Sputum can be obtained if PUI has a productive cough and can produce sputum. Sputum induction is not recommended.
- ✓ If the patient can produce sputum, have the patient rinse their mouth with water and then expectorate deep cough sputum directly into a sterile, leak-proof screw-cap collection cup or a sterile dry container.
- ✓ If the specimen is collected using an aerosol-generating procedure (such as tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation or bronchoscopy), the PUI should ideally be in an AIIR. If this is not possible than they should be placed in a private room with the door closed. The exhaust from this room should not recirculate throughout the facility without HEPA filtration.
- ✓ During any specimen collection only the PUI and essential HCP should be in the room.

Notify NPHL immediately after the specimen is collected by calling the 24/7 pager at (402) 888-5588.

Packing, Shipping and Transport

Packaging, shipping, and transport of specimens from a PUI for the COVID-19 to NPHL must follow shipping regulations for UN 3373 Biological Substance, Category B. All personnel who package and transport specimens (including couriers) need to be trained in safe handling practices and spill decontamination procedures. If necessary, NPHL will coordinate shipment for suspect PUI specimens.

- ✓ Place each specimen in leak-proof specimen bag (i.e., secondary container). Seal.
- ✓ Refrigerate specimen at 2-8°C before and during transport with frozen gel packs.
- ✓ Legibly complete entire NPHL Test Request Form <http://nphl.org/forms.cfm>, including correct patient address. Write “COVID-19” in the “Comments” section.
- ✓ Place NPHL Form in separate pocket on outside of specimen bag.
- ✓ Specimens sealed in secondary biohazard bags with appropriate paperwork, can be given directly to the NPHL ground courier. No special Category B boxes are required unless shipping by FedEx.
- ✓ Arrange for a courier by calling NPHL Client Services/NUIrt Support. Main Line: (402) 559-2440, Toll-Free: (866) 290-1406 or Client Service Pager: (402) 888-2086.
- ✓ If an NPHL courier is not possible or if they are unable to transport to NPHL within the day, please call the NPHL emergency pager at (402) 888-5588 to arrange FedEx shipments.
- ✓ DO NOT use a pneumatic-tube system to transport these specimens.
- ✓ The Interim 2019 Coronavirus (COVID-19) Patient Under Investigation (PUI) form will be completed by the Local Health Department and emailed to NPHL at nphl@unmc.edu or fax to (402) 559-7799.

Clinical Laboratory Testing on site

When indicated, clinical laboratories should continue to perform routine hematology, urinalysis, and clinical chemistry studies. Microbiology laboratories can also perform diagnostic tests on blood, sputum, urine or stool specimens. Risk assessments should be evaluated and tasks creating aerosols (below) can be performed in a BioSafety Level (BSL)-2 clinical lab, if BSL-3 practices are implemented. BSL-3 practices include adding respiratory protection (N-95 mask), a face shield or goggles, and utilization of a Biological Safety Cabinet (BSC). The following activities that involve manipulation of potentially infected respiratory specimens should be performed in a Class II BSC:

- ✓ Performing rapid diagnostic test kits such as those used for RSV, Strep A, and influenza kits (all respiratory specimens testing should be manipulated inside the BSC or behind a plastic shield).
- ✓ Loading and unloading of automated test analyzers e.g. multiplex PCR cartridges
- ✓ Aliquoting, vortexing and/or diluting specimens
- ✓ Inoculating bacterial or mycological culture media
- ✓ Nucleic acid extraction procedures
- ✓ Preparation and chemical- or heat-fixing of smears for microscopic analysis

Notes:

If a laboratory test confirms the presence of another respiratory cause of symptoms such as the influenza virus, RSV, or *Streptococcus pneumoniae*, but clinical suspicion remains high for either a co-infection or a secondary infection, then consideration for COVID-19 testing should be discussed with public health officials.

BioFire Diagnostics has reported that the coronavirus targets on their panels do not cross-react with the COVID-19. If the PCR assay is negative for all targets, call your local health department for advice on whether to forward the respiratory specimen to NPHL.

If your facility is unable to safely perform multiplex PCR analysis utilizing BSL-3 practices, the specimen can be submitted to NPHL for PCR analysis. Please check “Respiratory Pathogen Panel” on the NPHL Test Request Form and write “COVID-19” in the comments section.

Nebraska Public Health Laboratory Testing

The FDA announced the release of the Emergency Use Authorization (EUA) of CDC's 2019 Coronavirus (COVID-19) Real-time RT-PCR Diagnostic Panel has been released to select public health laboratories. Nebraska Public Health Laboratory now has this screening test in-house, validated and on stand-by to test a Nebraska PUI when approved. NPHL aspires to ensure that turn-around time and reporting of positive and negative results meet the needs of our HPCs.

Other resources:

<https://www.cdc.gov/coronavirus/2019-nCoV/lab/guidelines-clinical-specimens.html>

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance>

<https://emergency.cdc.gov/han/HAN00427.asp>

<https://www.cdc.gov/coronavirus/2019-nCoV/hcp/clinical-criteria.html>

<https://www.biofire.com>