Centers for Disease Control and Prevention

2019 Novel Coronavirus

Interim Laboratory Biosafety Guidelines for Handlin and Processing Specimens Associated with 2019 Nov Coronavirus (2019-nCoV)

On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak, COVID-19. CDC will be updating our website and other CDC materials to reflect the updated name.

Summary of Recent Changes

Revisions were made on February 10, 2020, to reflect the following:

- The term “certified” was added to clarify that a certified Class II Biological Safety Cabinet (BSC) should be used fo any laboratory procedure with the potential to generate aerosols or droplets.
- Additional details were provided for any laboratory procedures that are performed outside of a BSC.
- Additional details were provided about the use of EPA-registered hospital disinfectants.
- Additional details were provided for handling 2019-nCoV laboratory waste.
- The need for both site- and activity-specific risk assessments was added to determine if additional laboratory biosafety control measures are necessary.

February 10, 2020

Until more information becomes available, precautions should be taken in collecting and handling specimens that ma contain 2019-nCoV. Timely communication between clinical and laboratory staff is essential to minimize the risk incu in handling specimens from patients with possible 2019-nCoV infection. Such specimens should be labeled according and the laboratory should be alerted to ensure proper specimen handling. General and specific biosafety guidelines f handling 2019-nCoV specimens are provided below.

For additional detailed instructions please refer to the following:

- Biosafety in Microbiological and Biomedical Laboratories (BMBL) – Fifth Edition
- Laboratory Biosafety Manual – Third Editionexternal icon

General Guidelines (for working with potentially infectious materials)

Laboratory workers should wear appropriate personal protective equipment (PPE) which includes disposable gloves, laboratory coat/gown and eye protection when handling potentially infectious specimens.

Any procedure with the potential to generate aerosols or droplets (e.g., vortexing) should be performed in a certified Class II Biological Safety Cabinet (BSC). Appropriate physical containment devices (e.g., centrifuge safety buckets; seal rotors) should be used for centrifugation. Ideally, rotors and buckets should be loaded and unloaded in a BSC. For an procedures outside of a BSC, eye and face protection (e.g. goggles, mask, face shield) or other physical barriers (e.g. splash shield) should be used to minimize the risk of exposure to laboratory staff.

After specimens are processed, decontaminate work surfaces and equipment with appropriate disinfectants. Use EPA registered hospital disinfectants with label claims to be effective against other respiratory pathogens, such as season influenza and other human coronaviruses. Follow manufacturer's recommendations for use – dilution (i.e., concentration), contact time, and care in handling.

For 2019-nCoV laboratory waste, follow standard procedures associated with other respiratory pathogens, such as seasonal influenza and other human coronaviruses.

Specific Guidelines

Virus isolation in cell culture and initial characterization of viral agents recovered in cultures of 2019-nCoV specimens NOT recommended at this time, except in a BSL3 laboratory using BSL3 work practices.

The following activities may be performed in BSL-2 facilities using standard BSL- work practices:

- Pathologic examination and processing of formalin-fixed or otherwise inactivated tissues
- Molecular analysis of extracted nucleic acid preparations
- Electron microscopic studies with glutaraldehyde-fixed grids
- Routine examination of bacterial and mycotic cultures
- Routine staining and microscopic analysis of fixed smears
- Final packaging of specimens for transport to diagnostic laboratories for additional testing. Specimens should already be in a sealed, decontaminated primary container.
- Inactivated specimens (e.g., specimens in nucleic acid extraction buffer)

The following activities involving manipulation of potentially infected specimens should be, at a minimum, performed as above and in a certified Class II BSC in a BSL-2 facility. Site- and activity-specific risk assessments should be performed t determine if enhanced biosafety precautions are warranted based on situational needs (e.g. high testing volumes):

- Aliquoting and/or diluting specimens
- Inoculating bacterial or mycological culture media
- Performing diagnostic tests that do not involve propagation of viral agents in vitro or in vivo
- Nucleic acid extraction procedures involving potentially infected specimens

- Preparation and chemical- or heat-fixing of smears for microscopic analysis

Clinical Laboratory Testing

Clinical laboratories performing routine hematology, urinalysis, and clinical chemistry studies, and microbiology laboratories performing diagnostic tests on serum, blood, or urine specimens should follow standard laboratory practices, including Standard Precautions, when handling potential 2019-nCoV specimens. For additional information Biosafety in Microbiological and Biomedical Laboratories (BMBL) – Fifth Edition (page 225).

Packing, Shipping and Transport

Packaging, shipping, and transport of specimens from suspect cases or PUI's of 2019-nCoV infection must follow the current edition of the International Air Transport Association (IATA) Dangerous Goods Regulations .

Follow shipping regulations for UN 3373 Biological Substance, Category B when sending potential 2019-nCoV specim

Resources

- Packaging Checklist, see Category B Saf-T-Pak
- Packing Instructions 650 for UN 3373
  - Click on "Infectious substances" and there is an option to download the packing instructions.
- Labels for UN 3373
  - When using cold pack – Include the name and telephone number of the person who will be available during normal business hours who knows the content of the shipment (can be someone at CDC). Place the label on one side of the box and cover the label completely with clear tape (do not tape just the edges of th label).
  - When using dry ice – Include the name and telephone number of the person who will be available duri normal business hours who knows the content of the shipment (can be someone at CDC). Place the label o one side of the box and cover the label completely with clear tape (do not tape just the edges of the label).
- Schematic for packaging, UN 3373 Category B

Page last reviewed: February 10