## Considerations for Handling Potential SARS-CoV-2 Samples

### Bench work
- Whole blood, serum and urine
- Rapid respiratory testing performed at the point of care (no nucleic acid isolation)

### Laboratory Practices and Technique

#### Primary Barriers and Personal Protective Equipment (PPE)
- PPE: lab coat, single gloves, medical use surgical mask, eye protection, face shield
- Work behind plexiglass screen in an isolated designated area (minimum)
- Notify others in the lab
- Work with samples done over a plastic-backed benchtop pad

#### Administrative Controls:
- Training and competency verification on donning and doffing required PPE
  *** The Lancet https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30089-3/fulltext

**These considerations do not supersede any regulatory or country-specific requirements in your locale.**

Laboratory practices, techniques, and administrative controls build upon the previous level. Additional controls are indicated at each level.

### BSL2

- Using automated instruments and analyzers (if aerosol containment is a feature) some devices might be older and not contained
- Staining and microscopic analysis of fixed smears
- Examination of bacterial cultures
- Pathologic examination and processing of formalin-fixed or otherwise inactivated tissues
  - Inactivation methods should be validated
- Molecular analysis of extracted nucleic acid preparations
- Final packaging of specimens for transport to diagnostic laboratories for additional testing
- Specimens should already be in a sealed, decontaminated primary container
- Using inactivated specimens, such as specimens in nucleic acid extraction buffer
- Performing electron microscopic studies with glutaraldehyde-fixed grids
  * CDC Source

### Additional procedures
- Cytometry – fixed samples

#### Laboratory Practices and Technique
- Good (Standard) Microbiological Practices
- Access to the laboratory is restricted when work is being conducted
- All procedures in which infectious aerosols or splashes may be created are conducted in BSCs or other physical containment equipment.
- Use safety cups whenever possible to avoid exposure to aerosols.

#### Primary & Secondary Barriers and PPE
- PPE: medical use surgical mask, single gloves, gown/lab coat, eye protection
- BSCs, if available, are properly maintained and certified
- Mechanical ventilation systems that provide an inward flow of air without recirculation to spaces outside of the laboratory
- A method for decontaminating all laboratory wastes should be available in the facility

#### Administrative Controls:
- Training and competency verification for each procedure performed
- Laboratory personnel have specific training in handling pathogenic agents and are supervised by scientists competent in handling infectious agents and associated procedures
- Occupational health
  - mandatory reporting of any symptoms, any laboratory exposure
  - consider baseline blood, baseline questionnaire, emergency wallet card
- Demonstrated competency on working in a BSC (if available)

### BSL2 with BSL3 practices

- 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
  * CDC Source

### Additional procedures
- Respiratory samples and secretions
- Stool
- Cytometry – non-fixed samples
- Inactivated virus lysate
- Work with ANY sample that may produce an aerosol

#### Laboratory Practices and Technique
- Good (Standard) Microbiological Practices
- Primary & Secondary Barriers and PPE
- PPE: medical use surgical mask (blood)/N-95 (respiratory and stool samples), double gloves, impervious gown, eye protection with side shields
- All samples opened inside the BSC in case of spills/leakage. If BSC is not available, don N95 and face shield and work behind plexiglass screen in an isolated designated area, notify other laboratory workers when samples done over a plastic-backed benchtop pad
- Surface decontamination at every step using EPA List N disinfectants and contact times.

#### Administrative Controls:
- Scheduled time for handling SARS-CoV-2 samples (best practice)
- Two-person rule for minimizing withdrawing hands from BSC
- Centrifuging of blood specimens is in safety cups or sealed rotor, loaded and unloaded in a BSC
- Training and competency verification on donning and doffing required PPE
- Specific training on use of N95 respirators, if applicable
  (includes pulmonary function, medical clearance, and fit testing)

### BSL3

**Virus isolation in cell culture and initial characterization of viral agents recovered in cultures of SARS-CoV-2 specimens**

#### Additional procedures
- FACS/High Speed Cell Sorting
- Transfer of inactivated samples outside BSL3
- Inactivation by validated methods

#### Laboratory Practices and Technique
- Good (Standard) Microbiological Practices
  – Follow BSL3 practices and procedures according to CDC BMBL 5th ed.
- Laboratory personnel must receive specific training in handling pathogenic and potentially lethal agents and must be supervised by scientists competent in handling infectious agents and associated procedures.

#### Primary & Secondary Barriers and PPE
- All procedures involving the manipulation of infectious materials must be conducted within a BSC, or other physical containment devices.
- Respiratory protection is required (N95 or PAPR/CAPR)
- Autoclave waste before disposal
- Facility exhaust system must have HEPA filtration**

#### Shipping samples outside BSL3-facility based on risk assessment by biosafety officer
- Ensure lids are tight
- Decontaminate outside of tubes
- Wrap sample with absorbent material
- Individually place into zip-lock bag
- Seal zip-lock bag and change gloves
- Add all wrapped samples into second bag
- Wrap bagged samples in ample packaging and place into designated carrier, firmly attach lid