Ansell Protects™

PPE GUIDANCE FOR LABORATORY TECHNICIANS WHEN HANDLING AND PROCESSING SPECIMENS ASSOCIATED WITH COVID-19

Exposure to upper and lower respiratory tract specimens in the absence of appropriate containment and control measures is likely to represent the greatest risk of COVID-19 laboratory acquired infection. Laboratory staff must wear Personal Protective Equipment (PPE) when conducting work in a clinical diagnostic laboratory. PPE and clothing acts as a barrier to minimize the risk of exposure to aerosols, splashes and accidental inoculation. The clothing and equipment selected is dependent on the nature of the work performed. PPE must be removed on leaving the laboratory and hygiene practices including hand washing must be rigorously maintained.[1]

All laboratories should perform a site-specific and activity-specific risk assessment to identify and mitigate risks and follow Standard Precautions when handling clinical specimens, all of which may contain potentially infectious materials.[2]

According to WHO guidelines[3], laboratory technicians carrying out viral isolation on clinical specimens from patients who are suspected or confirmed to be infected with novel coronavirus must adhere to strict protocols. This should be performed only in laboratories capable of meeting additional containment requirements as set out by WHO, and laboratory workers should wear protective equipment, including;

Disposable gloves

Solid front or wrap-around gowns

Scrub suits, or coveralls with sleeves that fully cover the forearms

Head coverings

Shoe covers or dedicated shoes

Eye protection (goggles or face shield)

Risk assessment should inform the use of respiratory protection (fit-tested particulate respirator, e.g. EU FFP2, US 6 NIOSH-certified N95 or equivalent, or higher protection)

**Front-buttoned standard laboratory coats are unsuitable, as are sleeves that do not fully cover the forearms.*[2]

CDC guidelines specify for virus isolation in cell culture and initial characterization of viral agents recovered in cultures of COVID-19 specimens should only be conducted in a Biosafety Level 3 (BSL-3) laboratory using BSL03 practices.

Biosafety Laboratory Levels

Laboratory facilities are designated as:

Biosafety Level 1	Biosafety Level 2	Biosafety Level 3	Biosafety Level 4
Basic	Basic	Containment	Maximum Containment
			

Biosafety level designations are based on a composite of the design features, construction, containment facilities, equipment, practices and operational procedures required for working with agents from the various risk groups.[4,5]

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Table below relates but does not equate risk groups to the biosafety level of laboratories designed to work with organisms in each risk group.

Relation of risk groups to biosatety levels, practices and equipment

RISK GROUP	BIOSAFETY LEVEL	LABORATORY TYPE	LABORATORY PRACTICES	SAFETY EQUIPMENT
1	Basic - Biosafety Level 1	Basic teaching, research	GMT	None: open bench work
2	Basic - Biosafety Level 2	Primary health services: diagnostic services, research	GMT plus protective clothing, biohazard sign	Open bench plus BSC for potential aerosols
3	Containment - Biosafety Level 3	Special diagnostic services, research	As Level 2 plus special clothing, controlled access, directional airflow	BSC and/or other primary devices for all activities
4	Maximum containment - Biosafety Level 4	Dangerous pathogen units	As Level 3 plus airlock entry, shower exit, special waste disposal	Class III BSC, or positive pressure suits in conjunction with Class II BSCs, double-ended autoclave (through the wall), filtered air

BSC, biological safety cabinet: GMT, good microbiological techniques (see Part IV of WHO Laboratory Biosafety Manual)

PPE Guidance for the Different Biosafety Laboratory Levels

Biosafety Laboratory Level	PPE Guidance
Biosafety Level 1	• Personal protective equipment - gloves, gowns and goggles
Biosafety Level 2 (in addition to Level 1)	• Gloves worn when handling infectious material or contaminated equipment • Face protection provided when working outside the BSC (Biological Safety Cabinet) with infectious material • BSC used when potential for creating infectious aerosols/ splashes exists
Biosafety Level 3 & 4 (in addition to Levels 1 & 2)	• Closed-front gowns worn in laboratory • Protective laboratory clothing worn only in laboratory areas • Double gloves worn when handling infectious material, potentially contaminated equipment and work surfaces • Respiratory protection worn by all personnel in the laboratory when aerosols are not safely contained in a BSC • Face protection provided when working outside the BSC with infectious material
BSC (Biological Safety Cabinet)[4]	• Personal protective clothing should be worn whenever using a BSC • Laboratory coats are acceptable for work being performed at Biosafety Levels 1 and 2 • A solid front, back-closing laboratory gown provides better protection and should be used at Biosafety Levels 3 and 4 (except for suit laboratories) • Gloves should be pulled over the wrists of the gown rather than worn inside • Elasticized sleeves can be worn to protect the investigator's wrists • Masks and safety glasses may be required for some procedures

References

1. www.gov.uk/government/publications/wuhan-novel-coronavirus-guidance-for-clinical-diagnostic-laboratories/wuhan-novel-coronavirus-handling-and-processing-of-laboratory-specimens
2. www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html#guidance
3. www.who.int/docs/default-source/coronaviruse/laboratory-biosafety-novel-coronavirus-version-1-1.pdf?sfvrsn=912a9847_2
4. www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/
5. **Risk Group 1** (no or low individual and community risk) A microorganism that is unlikely to cause human or animal disease.
   Risk Group 2 (moderate individual risk, low community risk) A pathogen that can cause human or animal disease but is unlikely to be a serious hazard to laboratory workers, the community, livestock or the environment. Laboratory exposures may cause serious infection, but effective treatment and preventive measures are available and the risk of spread of infection is limited.
   Risk Group 3 (high individual risk, low community risk) A pathogen that usually causes serious human or animal disease but does not ordinarily spread from one infected individual to another. Effective treatment and preventive measures are available.
   Risk Group 4 (high individual and community risk) A pathogen that usually causes serious human or animal disease and that can be readily transmitted from one individual to another, directly or indirectly. Effective treatment and preventive measures are not usually available.

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