

# Summary of recommended biosafety levels for infectious agents/materials



Level	Biological Agent/Material	Practices and Techniques	Safety Equipment	Facilities
BSL-1	Not known to cause disease in healthy adults	Standard microbiological practices	None required	Open bench top sink required
BSL-2	Associated with human disease, hazard = auto-inoculation, ingestion, mucous membrane exposure.	BSL-1 Practices Plus: <ul style="list-style-type: none"> <li>➤ Limited access</li> <li>➤ Biohazard warning signs</li> <li>➤ “Sharps” precautions</li> <li>➤ Biosafety manual defining any needed waste decontamination or medical surveillance policies</li> </ul>	Primary barriers = Class I or II biosafety cabinets or other physical containment devices used for all manipulations of agents that cause splashes or aerosols of infectious materials; PPE; laboratory coats; gloves; face protection as needed	BSL-1 plus: <ul style="list-style-type: none"> <li>➤ Decontamination method available</li> </ul>
BSL-3	Indigenous or exotic agents with potential for aerosol transmission; disease may have serious or lethal consequences.	BSL-2 Practices Plus: <ul style="list-style-type: none"> <li>➤ Controlled Access</li> <li>➤ Decontamination of all waste</li> <li>➤ Decontamination of lab clothing before laundering</li> <li>➤ Baseline Serum</li> </ul>	Primary barriers = Class I or II biosafety cabinets or other physical containment devices used for all manipulations of agents; PPE; protective lab clothing; gloves; respiratory protection as needed	BSL-2 Plus: <ul style="list-style-type: none"> <li>➤ Physical separation from access corridors</li> <li>➤ Self-closing double door access</li> <li>➤ Exhausted air (not re-circulated)</li> <li>➤ Negative airflow into laboratory</li> </ul>
BSL-4	Dangerous/exotic agents which pose high risk of life-threatening disease, aerosol-transmitted lab infections; or related agents with unknown risk of transmission.	BSL-3 Practices Plus: <ul style="list-style-type: none"> <li>➤ Clothing change before entering</li> <li>➤ Shower upon exiting</li> <li>➤ All material decontaminated upon exiting facility</li> </ul>	Primary barriers = All procedures conducted in Class III biosafety cabinets or Class I or II biosafety cabinets in combination with full-body, air-supplied, positive pressure personnel suit	BSL-3 Plus: <ul style="list-style-type: none"> <li>➤ Separate building or isolated zone</li> <li>➤ Dedicated supply/exhaust, vacuum, and decontamination systems</li> <li>➤ Other requirements outlined in text</li> </ul>

For additional information, consult *Biosafety in Microbiological and Biomedical Laboratories*, U.S. Department of Health and Human Services, 5th edition, 2009