Primary Barriers

Safety equipment includes biological safety cabinets (BSCs), enclosed containers, and other engineering controls designed to remove or minimize exposures to hazardous biological materials. The BSC is the principal device used to provide containment of infectious splashes or aerosols generated by many microbiological procedures. Three types of BSCs (Class I, II, III) are used in microbiological laboratories are described and illustrated in the BMBL, Appendix A, Primary Containment: Biological Safety Cabinets. Open-front Class I and Class II BSCs are primary barriers that offer significant levels of protection to laboratory personnel and to the environment when used with good microbiological techniques. The Class II BSC also provides protection from external contamination of the materials (e.g., cell cultures, microbiological stocks) being manipulated inside the cabinet. The gas-tight Class III BSC provides the highest attainable level of protection to personnel and the environment.

An example of another primary barrier is the safety centrifuge bucket, an enclosed container designed to prevent aerosols from being released during centrifugation. To minimize aerosols, containment controls such as BSCs or centrifuge buckets must be used when handling infectious agents that can be transmitted through the aerosol route of exposure.

Personal protective equipment (PPE) is often used in combination with BSCs and other devices that contain the agents, animals, or materials being handled. In some situations, in which it is impractical to work in a BSC, PPE may form the primary barrier between personnel and infectious materials from certain animal studies, animal necropsy, agent production activities, and activities relating to maintenance, service, or support of the laboratory facility.