primary containment devices, engineered safety equipment (e.g., sealed centrifuges or eyewashes), and risk assessment. These practices generally become more restrictive with the higher levels of containment.

4. ***Personal protective equipment (PPE):*** The availability of PPE varies as a function of the hazard posed by the pathogen. For example, respiratory protection will be required for any pathogen that could become airborne and infect a healthy adult worker. Additional protective equipment is generally associated with higher levels of biological containment.
5. ***Containment levels:*** The primary levels of biological containment are reviewed in the BMBL (CDC 2009). Higher containment of human pathogens also corresponds with higher hazard pathogens. Infectious diseases with no cures generally require rigorous containment facilities and procedures.
6. ***Decontamination, disinfection, and sterilization:*** The differences among decontamination, disinfection, and sterilization are reviewed in this chapter. Common procedures to monitor the efficacy of *chemical*, *heat*, and *steam sterilization* are also included.
7. ***Signage, notices, entrance criteria, and postings:*** For hazard awareness and protective equipment-donning purposes, areas that use biological agents must include appropriate notices and postings. Employees must refer to entrance criteria prior to entering a containment facility. These criteria may include protective equipment or immunization requirements.
8. ***Prudent management of biological/infectious wastes:*** Procedures for safe disposal of medical waste and sharps waste apply to many employers in the United States. Improper disposal of contaminated waste materials and laundry have been associated with secondary infections in the recent past.
9. ***Operation and use of biological safety cabinetry:*** The primary containment devices, such as BSCs, represent a fundamental part of biological containment. These devices provide protection to employees, their research specimen, and the surrounding public. An overview with figures from the BMBL (CDC 2009) is included in this chapter.
10. ***Emergency action, spill response, needlesticks and self-inoculation:*** The CDC gives healthcare providers guidance on emergency response and needlestick treatment protocols in an effort to reduce the probability of transmitting a human pathogen. OSHA requires needlestick procedures under its bloodborne pathogen regulations (OSHA 2001).

Institutional Biosafety Committees (IBCs)

The NIH recommends that all individuals, corporations, or institutions not strictly covered by the *NIH Guidelines* establish a properly constituted IBC. Even if an entity is not using recombinant DNA, a properly constituted safety committee should review the presence of biological hazards in the workplace. The IBC is responsible for the following on behalf of the institution:

1. Reviewing procedures, tasks, and protocols involving biohazardous agents, toxins originating from biohazardous materials, and blood and tissues from humans and nonhuman primates
2. Reviewing recombinant DNA research and approving those proposed projects that conform to the *NIH Guidelines*. Specific IBC review items are detailed within those guidelines (2011).
3. Notifying a principal investigator of the results of the committee protocol review.
4. Lowering containment levels for certain agents.
5. Setting acceptable containment levels for experiments involving whole plants or animals.
6. Periodically reviewing recombinant DNA or other applicable research at the institution.
7. Adopting emergency response plans.
8. Reporting significant problems or violations of the *NIH Guidelines* (2011) to the NIH.