Laboratory safety instructions

Rules of conduct and general safety

Many of the microorganisms used in this course may be pathogenic for humans and animals. As a result, certain rules are necessary to avoid the possibility of infecting yourself or other people. The following laboratory safety instructions have been adopted.

1. *Microbiological procedures,* including:

a. reporting all spills and broken glassware to the instructor and receiving instructions for cleanup.

b. methods for aseptic transfer minimizing or containing the production of aerosols and describing the hazards associated with aerosols.

c. washing hands prior to and following laboratories and at any time contamination is Suspected.

e. never eating or drinking in the laboratory

f. using universal precautions

g. disinfecting lab benches prior to and at the conclusion of each lab session.

h. identification and proper disposal of different types of waste.

i. never applying cosmetics, including contact lenses, or placing objects (fingers, pencils) in the mouth or touching the face.

k. good lab practice, including returning materials to proper locations, proper care and handling of equipment, and keeping the bench top clear of extraneous materials

2. *Protective procedures,* including:

a. tying long hair back, wearing personal protective equipment (eye protection, coats, closed shoes; glasses may be preferred to contact lenses), and using such equipment in appropriate situations.

b. always using appropriate pipetting devices and understanding that mouth pipetting is forbidden.

3. *Emergency procedures,* including :

a. locating and properly using emergency equipment (eye-wash stations, first-aid kits, fire extinguishers, chemical safety showers, telephones, and emergency numbers)

b. reporting all injuries immediately to the instructor.

c. following proper steps in the event of an emergency.

Universal precautions

1. Gloves should be worn for touching blood and body fluids, mucous membranes, or non-intact skin of all patients, for handling items or surfaces soiled with blood or body fluids, and for performing vein puncture and other vascular access procedures. Gloves should be changed after contact with each patient.

2. Masks and protective eyewear or face shields should be worn during procedures that are likely to generate droplets of blood or other body fluids to prevent exposure of mucous membranes of the mouth, nose, and eyes.

3. Gowns or aprons should be worn during procedures that are likely to generate splashes of blood or other body fluids.

4. Hands and other skin surfaces should be washed immediately and thoroughly if contaminated with blood or other body fluids. Hands should be washed immediately after gloves are removed.

5. All health-care workers should take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures. To prevent needle stick injuries, needles should not be recapped, purposely bent or broken by hand, removed from disposable syringes, or otherwise manipulated by hand. After they are used, disposable syringes and needles, scalpel blades, and other sharp items should be placed in puncture-resistant containers for disposal.

6. Health-care workers who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling patient-care equipment.

7. <u>The following procedure should be used to clean up spills of blood or blood-containing fluids</u>: (1) Put on gloves and any other necessary barriers. (2) Wipe up excess material with disposable towels and place the towels in a container for sterilization. (3) Disinfect the area with either a commercial germicide or household bleach (sodium hypochlorite). The latter should be diluted from 1:100 (smooth surfaces) to 1:10 (porous or dirty surfaces); the dilution should be no more than 24 hours old. When dealing with large spills or those containing sharp objects such as broken glass, first cover the spill with disposable toweling. Then saturate the toweling with commercial germicide or a 1:10 bleach solution and allow it to stand for at least 10 minutes. Finally clean as described above.

Precautions for Laboratories

1.All specimens of blood and body fluids should be put in a well-constructed container with a secure lid to prevent leaking during transport. Care should be taken when collecting each specimen to avoid contaminating the outside of the container and of the laboratory form accompanying the specimen.

2. All persons processing blood and body-fluid specimens should wear gloves. Masks and protective eyewear should be worn if mucous membrane contact with blood or body fluids is anticipated. Gloves should be changed and hands washed after completion of specimen processing.

3. For routine procedures, such as histologic and pathologic studies or microbiologic culturing, a biological safety cabinet is not necessary. However, biological safety cabinets should be used whenever procedures are conducted that have a high potential for generating droplets.

4. Mechanical pipetting devices should be used for manipulating all liquids in the laboratory. Mouth pipetting must not be done,

5. Use of needles and syringes should be limited to situations in which there is no alternative.

6. Laboratory work surfaces should be decontaminated with an appropriate chemical germicide after a spill of blood or other body fluids and when work activities are completed.

7. Contaminated materials used in laboratory tests should be decontaminated before reprocessing or be placed in bags and disposed of in accordance with institutional policies for disposal of infective waste.

8. Scientific equipment that has been contaminated with blood or other body fluids should be decontaminated and cleaned before being repaired in the laboratory or transported to the manufacturer.

9. All persons should wash their hands after completing laboratory activities and should remove protective clothing before leaving the laboratory.

10. There should be no eating, drinking, or smoking in the work area.

Biosafety

The common understanding of ***biosafety*** is derived from the practical guidance issued by the World Health Organization (WHO) on techniques for use in laboratories that include the necessary safety precautions are taken, to protect populations and the environment. Because the pathogenicity of microorganisms (MO) actually extends along a range from low to high. To recognize this, the WHO has adopted a system of biosafety categories for pathogens based on their degree of pathogenicity and the relative danger in handling them. This system assigns microbes to one of four levels or classes as in the following table:

Biosafety level	***Practices***	***Facilities***	***Risk of infection***
1	Standard microbiological practices	Laboratory coats and gloves; eye, face protection are needed laboratory bench	Low infection hazard; class 1 microbes not generally considered pathogens
2	Biohazard warning signs, Sharps precautions, Biosafety manual defining any needed waste decontamination	Level 1 facilities with safety cabinets and Autoclave may be needed	Moderate infection hazard; level 2 pathogens can cause disease in healthy people but can be controlled with proper facilities;
3	Controlled access, decontamination of all waste , no unsterilized materials can leave the lab; personnel are monitored and vaccinated.	Protective laboratory clothing, gloves, face, eye and respiratory protection, as needed With level 2 facilities	Agents can cause severe or lethal disease especially when inhaled
4	clothing changes and showers required for all people entering and leaving; materials must be autoclaved or gas sterilized .	Minimum of Level 3 facilities and practices Separate building or isolated zone	highly virulent microbes that pose extreme risk for morbidity and mortality when inhaled in droplet or aerosol

Biosecurity

Biosecurity referred to "***the protection of microbiological resources from theft, loss or diversion, which could lead to the inappropriate use of these agents to cause public health harm".*** WHO adapted a program provides direction on, and promotes the use of, safe and secure workplace practices, appropriate protective equipment, engineering and governmental controls in the handling of pathogenic organisms in laboratories, during transportation, in field investigations and in vaccine manufacturing facilities, to protect workers, the environment and the community from exposure, infection, and following development of disease.

Biosafety protects people from germs – biosecurity protects germs from people.