Chapter 2

General Safety Guidelines

UNIVERSAL PRECAUTION:

Always treat all blood products and any body fluids as potentially infectious.

1. All specimens are potentially infectious and should be handled with extreme care and as potentially infectious.
2. Personal protective equipment such as laboratory coats, mask or gloves should be worn at all times to avoid contamination.
3. Biological specimen and any contaminated articles like lancets, needle, syringe and high infective specimen vials should be disposed of or placed in a puncture proof biohazard containers soaked in decontaminating solution then sealed properly before disposal.
4. Contaminated utensils, glassware and equipment should be sterilized before and after using them.
5. Sterilizing the area before and after used should be practiced to prevent further spread of contaminants.
6. Immunization of vaccination should be required to all personnel exposed to any possible pathogens to ensure safety of the person.
7. Proper hand washing before and after handling patients should be established in the laboratory.
8. Prohibition of eating, drinking and smoking in the laboratory.
9. Limiting access to authorized personnel only.

I. Chemical Safety

1. Use with the extreme caution reagents, which are strong acids and strong bases. Avoiding splashes, contact with the skin and eyes. Do not inhale fumes (i.e. methanol, formaldehyde, etc).
2. Any chemical which comes in contact with the skin and eyes should be immediately be washed with running water for approximately 5 minutes, unless the label says otherwise.
3. Chemical should be disposed properly in accordance with the manufacturer's instruction, however, directions, which are explicitly provided in the label as to disposal, should be strictly followed.
4. Read all labels for precautions handling and emergency management of potential hazards of reagents.
5. Use with extreme care mouth pipetting procedures. Use long rubber to avoid aspirating by mouth pipetting.

II. Biological Safety

As all blood samples, body fluids, are potentially infectious, they must be handed according to the "standard precaution" which covers the transmission of any pathogens. Specific precaution for

preventing the transmission of blood borne infection from laboratory instruments and material and procedures for managing blood borne exposure should be taken in place.

III. Electrical Safety

1. Annual electricity check.
2. New equipment should undergo electrical safety check.
3. Power cord should be checked from time to time.
4. There should be enough electrical out let to prevent overloading.
5. Repair of electrical system should be performed by electrical personnel.
6. Power supply or adaptors should be provided for heavy equipment to prevent shortage of voltage.

IV. Laboratory Safety

1. Be prepared to work when you arrived at the laboratory. Familiarize yourself in advance with the lab procedures to be performed.
2. Follow all instruction both written and oral carefully.
3. Work area should be clean and tidy at all times.
4. A laboratory safety manual based on national legislation standards
5. Training on laboratory safety for all personnel in the work area
6. Manual or training on safe handling and disposing of biological hazard materials and safe handling of equipment
7. All personal protective equipment should be provided in the work area such as gloves, mask and laboratory coats.
8. Only authorized personnel should have an access in the laboratory at all times
9. Wear a Laboratory gown or apron to protect yourself and your clothing from spilled chemicals.
10. Long hair should be tied up or covered, especially in the vicinity of open flames.
11. Jewelry that might present safety hazard, such as dangling necklace, chain, medallion or bracelets should not be worn in the lab.
12. Gloves should be worn by handling the sera and when performing the test.
13. Wash your hand thoroughly.
14. Read the label on the reagent bottle twice before taking any chemicals.
15. Avoid having contact getting in the skin. If a compound is spilled on your hands, wash them thoroughly with soap and running water.
16. Whenever using a volatile, strongly irritating or toxic chemicals, work under a hood that has strong ventilation.
17. Add reagent slowly, do not dump it in.
18. Never get Chemical/ reagent from unlabeled bottle.
19. Clean all materials / apparatus/ equipment used before returning it to their respective places.
20. Clean your working area before leaving the Laboratory.
21. Biological safety cabinet is highly recommended.
22. Observe proper waste disposal.
23. Clean up all spills immediately cover with disinfectant.

24. Pencils, ball pen and other materials should never be place in the mouth. Eating, smoking, and drinking are strictly prohibited in the working area.
25. All electrical outlets and equipment must be properly label on corresponding voltage equipment.
26. Know the location of emergency equipment (first aid kit, fire extinguisher, emergency shower, etc.).
27. Safety manual containing info about procedures to following case of fire, flood, earthquake and other natural disaster, location of all safety equipment and practices to follow in the event of a situation posting a safety hazard must be readily available to all laboratory personnel.
28. Visitors especially small children should be discourage.
29. All potentially infectious agents must be decontaminated before disposal.
30. Instruments such as scissors, forceps, scalpel, blade holders, etc. Must be autoclaved.
31. Sharp objects should be inserted in a suitable container, clearly labeled as to contents and discarded.
32. Report all accidents to the safety coordinates or his representative.

V. Personal Safety

For your safety avoid wearing accessory and jewellery since such are potential hazard to you and your patient. Avoid Wearing open toe-shoes in case chemicals or infectious sample accidentally spill into you. Always wear laboratory coat and/or proper uniform whenever working in the laboratory. Always wear gloves when handling patient and specimen. If possible wear mask to protect yourself from any communicable disease and droplets from patients. Wearing safety goggles is also a must to ensure no chemical will come in contact to your eyes.

VI. Eye Safety

You must wear chemical spill protection safety goggles whenever anyone in laboratory is handling chemicals in accordance to the department of health standards.

FIRST AID SUGGESTIONS

In the laboratory, three serious kinds of accidents are liable to happen, though all three (3) are avoidable if one is very cautious and careful.

a. Cuts from glassware
b. Burns from flames
c. Burns or other injuries due to contact with chemicals.

Bad cuts are often caused by careless handling or glass tubes. In inserting a glass tube into a cork or rubber stopper, wet the end of the tube to be inserted; then with gentle pressure work it out through the hole in the stopper. Do not force the tube through the cork rapidly.

Report any accident to the head immediately. If the injury is serious, seek medical help without delay.

1. Cuts

Sterilize the area of the wound and stop the bleeding by bandaging. A doctor should dress serious cuts after aid has been given.

2. Burns and Scalds

Keep the burn area clean. Apply sterile mineral oils or burn ointment to exclude air. Use picric acid gauze in the form of compress. Do not use tannic acid or any tannin preparation.

3. Strong Acids

On skin, wash with water and then with dilute alkali; sodium bicarbonate solution. In the eyes, wash well with water; apply very dilute sodium bicarbonate solutions and more water. On clothes, apply ammonia water, then water.

4. Inhalation of poisonous vapors

Immediately sit or lie down and breathe deeply. Inhalation of vapors from a wad or cotton moistened with alcohol is soothing when a halogen has been inhaled. If considerable amounts of vapor have been inhaled, summon a physician without delay. Avoid moving the patient.

5. Strong Alkali

On skin, wash well with water then apply boric acid solution. In the eyes, wash well with water, apply boric acid eyewash solution, and then rinse with water. On clothes, apply vinegar or dilute acids, and wash with water.

If accidentally you spill any kind of chemicals or any specimen in your eye, immediately begin to rinse it with running water or by using the eye wash bottle holding you eye open. Flush the area with water for at least 15 minutes and then medical attention.

Chemical Handling

Always know how hazard the chemicals or reagent in order for you to set precautionary measure against its danger. In case you clothing caught fire, immediately drop to the floor and roll to smother the flame. If the fire is manageable, use a fire extinguisher to put the fire out. Do not put water on organic chemical fire. Serologic testing may involve use of chemical reagents that must be handled in a safe manner to avoid injury. General rules for safe handling of chemicals include: taking precautions to avoid getting chemicals on your body, clothes, and work area; wearing PPE such as safety goggles when pouring chemicals, observing strict labelling practices and carefully following instructions. Preparing reagents under a fume hood is a recommended safety precaution. Chemicals should never be mixed together unless specific instructions are followed, and they must be added in the order specified. This is particularly important when combining acid and water because acid should always be added to water to avoid the possibility of sudden splashing.

Flammable Chemicals:

The method for proper handling of these flammable chemicals depends on their flammability rating; the flammability rating for diethyl ether is “4” while acetone, methanol, ethanol and hexanes are “3”. Ether is extremely flammable and any spark or heat can ignite it easily. It’s quite volatile and its vapor can travel quickly away from the immediate working area. Never use ether in a lab that has an open flame anywhere in the room. Be careful not to spill any flammable solvent on a heating mantle or hot plate. Keep them away from any electrical outlet. The other four solvents listed will readily burn but they are not as likely to spontaneous combust.

In case of Fire:

- If your clothing catches fire, immediately drop to the floor and roll to smother the fire and call for help.
- If a command or solvent catches on fire, if you can, quickly cover the flames with a piece of glassware.
- If it is feasible, use a fire extinguisher to put the fire out.
- Do not put water on an organic chemical on fire because it will only spread the fire.
- If the fire is large, do not take chances: evacuate the lab and the building immediately and call for help.
- If fire alarms are available on the facility make sure you pull them before leaving the building.

If you inhale vapors:

- Leave the area immediately – at least into the hallway or where you can take fresh air, and if necessary take first aid or get medical attention

If you spill chemical or specimen on yourself:

- Immediately rinse the affected area with lots of water. Use soap if you wish but never try to treat the spill with another solvent or chemical unless directed by a medical specialist

Handling of Glassware, Needles and Sharps:

Use common sense in handling glassware. Keep them away from the edges of the bench top. Always clamp them properly or capped them properly to prevent accidents. Check for hairline cracks or star cracks before using them especially when you are using them for heating.

Sharp objects in the laboratory, including needles, lancets, and broken glassware, present serious biologic hazard for possible exposure to blood borne pathogens cause by accident puncture. Although blood borne pathogens also are transmitted through contact with mucous membranes and non-intact skin, a needle or lancet used to collect blood has the capability to produce a very significant exposure to blood borne pathogens. It is essential that safety precautions be followed at all times when sharps hazards are present.

The number one personal safety rule when using needles is to never manually recap a needle. Many safety devices are available for needle disposal, and they provide a variety of safe guards. These include needle holders that become sheathe, needles that automatically re-sheathe or become blunt, and needles with attached sheathes. All sharps must be disposed on puncture-resistant, leak-proof containers labelled biohazard symbol. Containers should be located in close proximity to the work area. Containers must always be replaced when the safe capacity mark is reached.

If you cut / puncture yourself

If you cut or puncture yourself, wash the wound right away with large amount of cool water. Let it bleed for some times then apply pressure to stop the bleeding. Then apply disinfectant. Same precaution applied as when punctured by a needle. Then seek for medical advice.

Hand Washing

Hand contact presents the number one method of infection transmission. Hands should always be washed: before patient contact, when gloves are removed, prior to leaving the work area, at any time when they have knowingly contaminated, before going to designated break areas, and before and after using bathroom facilities.

Correct routine hand washing technique includes:

1. Wet hands with preferably warm water.
2. Applying soap, preferably antimicrobial
3. Rubbing to form lather, creating friction, and loosening debris.
4. Thoroughly cleaning between fingers and under fingernails and rings for at least 15 seconds and cleaning up to the wrist.
5. Rinsing hands in a downward position.
6. Drying with a paper towel.
7. Turning off faucets with the paper towel to prevent recontamination.

GUIDELINES ON WASTE DISPOSAL

1. All needles must be kept inside the container of the non-puncture plastic container with a few amount of chlorox, and then sealed it when the container reach the ¾ full then collected by Safe Waste Inc. once a month.
2. For hazardous specimen and waste will be sealed in yellow plastic and then collected by Safe Waste Inc. once a month.
3. Waste being collected by the municipal truck-all cottons, plasters, papers, tissue and gauze are kept in a plastic to be collected at the end of the day.
4. Container of stool, urine and sputum must be kept inside a plastic bag with decontaminant (chlorox or Lysol).
5. Specimen bottles, reagent bottles, and test tubes are washable and must be kept inside the oven for drying.
6. For non-hazardous waste the municipal collection system is in charged for it.

A. Use of Personnel Protective Equipment

Water – resistant utility gloves rather than latex or vinyl gloves shall be used for handling hazardous waste, laboratory gowns, goggles, masks.

B. Segregation

The housekeeping staff trained in waste management for classification and bagging in appropriate waste disposal bags or container shall do segregation at the point of waste generation. Use yellow garbage bags for infectious and black for non-infectious.

C. Treatment

All hazardous waste shall be documented prior to packaging by any of the following methods: