Subject: Personal Protective Equipment/Lec3

Primary and Secondary Barriers or Containment

Primary Barriers:

Include Good microbial techniques and safety equipment provide sufficient primary protection of workers, people and laboratory environment from exposure to infectious agents. Examples of primary barriers include safety equipment or PPE personal protective equipment, such as lab coats and gloves. Also other barriers such as biological safety cabinets, enclosed containers, and safety centrifuge cups.

Secondary barriers:

Include good facility design and operational practices that protects the external environment outside hospitals and clinical laboratories from exposure to infectious materials. Examples of secondary barriers include separation of work place from public areas, decontamination facilities, hand washing facilities, special ventilation systems, and airlocks.

Personal Protective Equipment

Personal Protective Equipment (PPE) are specialized clothing or equipment worn by an employee to provide protection against a hazard (e.g., infectious agents and toxins). General work clothes (e.g., uniform, pants, shirts, blouses) are not considered as PPE. Wearing and taking off PPE require significant training called **doffing and donning** of training.

The use of specific PPE required is determined through a risk assessment and purpose of use. PPE can be used for basic practice as **eye protection** (safety glasses or goggles), **gloves**, and a **lab coat** or as complex practice as a Biosafety Level 4 “positive pressure suit” that completely isolates the employee from the laboratory environment.

The PPE include:

1. Aerosol prevention, Mucous Membrane and Respiratory Protection:

Aerosols are microscopic droplets that may contain infectious agents or toxins, e.g. the droplets produced by a patient sneeze or a cough or infectious materials (e.g., inhaling particles or liquid sprays). Some laboratory procedures including sonication, centrifugation, vortexing, homogenization can produce infectious aerosols. **Mucous Membrane and Respiratory Products** are infectious products of infected patients and they are usually infectious.
The followings are aerosol prevention equipment:

- Surgical mask.
- N95 special masks.
- Face shields.
- Special ventilation system.
- Full-face respirators.
- Gas masks.

2. Hand protection equipment: they include different gloves used according to the purposes:

- **Latex gloves:** designed to protect hands from contact with potentially hazardous materials (e.g., infectious agents and toxins or corrosive chemicals). Also, removing gloves after use carefully to minimize contamination.

- **Nitrile gloves** can be used by people who are allergic to latex.

- **Cut resistance** gloves can be used by people in contact with sharp objects (Sharps objects: are needles, broken glass or other any sharp instruments capable of breaking the skin).

3. Eye protection equipment: include **Eye Goggles and safety glasses** provide eye protection from splashes of chemicals or liquids containing infectious agents or toxins. Laboratory goggles and safety glasses should include face shields to prevent splashes at an angle from reaching the eye. For people who wear glasses, prescription of special goggles are used.

4. Body protection equipment: include **Lab coats and Gowns** to protect skin and street clothing from potential hazards such as materials containing infectious agents or toxins and dangerous chemicals when working in a laboratory environment. Most lab coats can be washed and decontaminated. Gowns are usually disposed with other contaminated waste. **Hair cup** is used to protect hair from contamination and chemicals.

5. Foot protection boots: include many kinds of boots according to purposes, also shoe cover is important to be used during entry of special units in hospitals like burned patient unit.