

 <b>NUS</b> <small>National University of Singapore</small>	<b>NUS Safety &amp; Health Guidelines</b>		Procedure No:	OSHE/SOP/GL/08
	Title: <b>Personal Protective Equipment</b>		Revision No: Issue Date :	000 21-Oct-04
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Prepared By	Approved By	Review Date		
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## 1.0 OBJECTIVE

The objective of this document is to provide guidance on the selection and use of Personal Protective Equipment (PPE). This SOP addresses eye, face, head, foot, hand, hearing and respiratory protection.

## 2.0 SCOPE

All laboratories under the management of NUS. This procedure is applicable to the chemical, biological and radiation safety programmes.

## 3.0 RESPONSIBILITIES

### 3.1 Principal Investigators

PIs have the primary responsibility for implementation of the SOP for PPE in their work area. This involves:

- a. Arranging to provide appropriate PPE to employees and students where applicable.
- b. Ensuring employees are trained on the proper use, care, and maintenance of PPE.
- c. Supervising staff to ensure that the PPE Program elements are followed and that employees properly use and care for PPE.

### 3.2 Users

Users are responsible for following:

- a. Wearing PPE as required.
- b. Attending required training sessions.
- c. Caring for, cleaning, and maintaining PPE as required.

## 4.0 DEFINITION

**Personal Protective Equipment (PPE):** Clothing and other work accessories designed to create a physical barrier against workplace hazards.

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## 5.0 PROCEDURES

### 5.1 Risk Assessment and Equipment Selection

- a. Principal Investigators shall select the necessary PPE based on the risk assessment. Care will be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards shall be provided or recommended for purchase.
- b. PPE used shall meet Singapore Standards (refer to Section 7).

### 5.2 Protective Devices

- a. Eye and Face Protection
  - i. Suitable protectors shall be used when employees are exposed to hazards from flying particles, molten metal, acids or caustic liquids, chemical liquids, gases, vapors, bio-aerosols, or potentially injurious light radiation.
  - ii. Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment.
  - iii. When there is a hazard from flying objects, safety glasses with side protectors shall be used.
  - iv. Goggles and face shields shall be used when there is a hazard from chemical splash or if there is a high potential for creating aerosols. These include necropsy of infected animals, harvesting of tissues, or fluids from infected animals and manipulations of high concentrations or large volumes of infectious materials. Face shields should be worn over additional eye protection (safety glasses or goggles).
  - v. For employees who wear prescription lenses, eye protectors shall either incorporate the prescription in the design, or fit properly over the prescription lenses.
  - vi. Equipment fitted with appropriate filter lenses shall be used to protect against light radiation. Tinted and shaded lenses are not filter lenses unless they are marked or identified as such.
  - vii. Appropriate eye and face protection should also be worn by all personnel entering animal rooms housing non-human primates.
- b. Head Protection
  - i. Head protection will be furnished to, and used by, all employees and contractors engaged in construction or in

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areas where there are hazard from falling or fixed objects or electrical shock hazards.

- ii. Head protection is also required to be worn by engineers, inspectors, and visitors at construction sites.

c. Foot Protection

- i. Safety shoes or boots with impact protection are required to be worn in work areas where carrying or handling materials such as packages, objects, parts or heavy tools, which could be dropped; and for other activities where objects might fall onto the feet.
- ii. Safety shoes or boots with compression protection are required for work activities involving skid trucks (manual materials handling cars) or other activities in which materials or equipment could potentially roll over an employee's feet.
- iii. Safety shoes or boots with puncture protection are required where sharp objects such as nails, wire, tacks, screws, large staples, scrap metal etc., could be stepped on by employees causing a foot injury.
- iv. For general biological lab use, comfortable shoes such as tennis shoes or nurses shoes are used extensively.
- v. Sandals and other types of open-toed shoes are not permitted in labs using biohazards or chemicals, due to the potential exposure to infectious agents or toxic materials as well as physical injuries associated with the work.
- vi. Boots, shoe covers, or other protective footwear, and disinfectant footbath may be required for work in BSL3 labs.
- vii. Gloves are worn in labs and animal rooms when handling infected animals and when skin contact with infectious materials, including blood and body fluids, is unavoidable.

d. Hand Protection

- i. Suitable gloves shall be worn when hazards from chemicals, cuts, lacerations, abrasions, punctures, burns, biological, and harmful temperature extremes are present.
- ii. Glove selection shall be based on performance characteristics of the gloves, conditions, durations of use, and hazards present. Requirements may range from impervious gloves that prevent liquid penetration to thermally insulated gloves for handling cold materials.
- iii. Consult the MSDS on glove selection. Recommended glove types are often listed in the section for personal protective equipment in the MSDS.

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e. Hearing Protection

Hearing protective devices such as ear plugs and ear muffs shall be used in areas with elevated noise levels (> 85 dBA over 8 hrs). These devices should attenuate noise sufficiently to prevent hearing damage, but not to the extent that the wearer is virtually deaf to emergency warnings etc.

f. Respiratory Protection

Employees involved with asbestos removal, chemical emergency response, facilities maintenance, plant operations, and infectious materials may require respirators.

g. Laboratory Coats and Gowns

i. The lab coats protect street clothing against biological or chemical spills as well as to provide some additional body protection.

ii. The CDC/NIH guidelines for bio-containment practices recommend the use of a lab coat, gown, smock, or uniform while working in BSL2 laboratories. Solid-front or wrap-around gowns with elasticised cuffs, scrub suits, or coveralls should be used where applicable.

### 5.3 Cleaning and Maintenance of PPE

- a. All PPE must be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. PPE should be inspected, cleaned, and maintained at regular intervals so that the PPE provides the requisite protection.
- b. Personal protective equipment shall not be shared between employees until it has been properly cleaned and sanitized. PPE will be distributed for individual use whenever possible.
- c. It is also important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards. Refer to Hazardous Waste SOP.

### 5.4 Training

- a. Any employee required to wear PPE shall receive training in the proper use and care of PPE.

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- b. Periodic retraining shall be offered by OSHE to both the employees and the supervisors, as needed. The training shall include, but not necessarily be limited to, the following subjects:
- i. When PPE is necessary to be worn.
  - ii. What PPE is necessary
  - iii. How to properly don, adjust, wear and remove PPE.
  - iv. The limitations of the PPE.
  - v. The proper care, maintenance, useful life and disposal of the PPE.

## 6.0 RECORDS

- a. Written records shall be kept of the PPE issued to each person. This applies to PPEs that require maintenance and training before use.
- b. The records of the training should be maintained by writing the names of persons trained, the type of training provided, and the dates when training occurred.
- c. The Department or Principal Investigators Supervisor shall maintain their employees' training records for at least 3 years.

## 7.0 REFERENCES

- a. Center for Disease Control- Personal Protective Equipment Program
- b. SS 105 : 1997 Safety Footwear
- c. SS 98 : 1997 Industrial Safety Helmets
- d. SS 261 : 1997 Industrial Safety Gloves and Mittens
- e. SS 304 : 1995 Industrial Overall