



ENVIRONMENTAL HEALTH & SAFETY DEPARTMENT

BIOHAZARD MANAGEMENT PLAN (Reviewed December 2015)

CSU SAN BERNARDINO

BIOHAZARD MANAGEMENT PLAN

EXECUTIVE SUMMARY

Materials that are hazardous to humans as a result of their biological or infectious properties (as opposed to chemical or physical) are called *biohazardous materials* or simply *biohazards*. The management of biological hazards through the proper application of engineered containment devices and administrative controls is usually referred to as *biosafety* or *biohazard control*. An effective biohazard management program should have the following objectives:

1. Preventing or minimizing the possibility of infection as a result of any activities involving biohazardous materials and
2. Assuring that all biohazardous material handling, storage, and waste management activities are performed in compliance with applicable standards and regulations.

A comprehensive Biohazard Management Plan has been developed for CSUSB. This plan provides guidance, prescribes requirements, and assigns responsibilities aimed at achieving the objectives listed above. Primary responsibility for proper Biohazard Management resides with all employees that may encounter biohazards including custodians, nurses, Public Safety officers, Principal Investigators, Lab Supervisors, and Instructional Technicians, although important functions are also assigned to the Environmental Health and Safety Department.

Since there are many facets to this plan, and in order to facilitate implementation, the plan has been divided into three distinct parts:

Part I describes the principles and criteria related to general management of biological hazards in laboratory settings, including a classification scheme for biosafety levels

Part II describes the University's Procedure for controlling the spread of bloodborne pathogens

Part III is the University's Procedure for the management of infectious wastes.

This delineation is also based on the different recommendations and regulations with which CSUSB activities must comply. Part I implements the recommendations of Center for Disease Control National Institutes of Health, as stated in their publication **Biosafety in Microbiological and Biomedical Laboratories**. Part II is based on the Occupational Health and Safety Administration (OSHA) **Standards for Blood-borne Pathogens**. Part III includes regulatory requirements promulgated by California Department of Industrial Relations (Cal-OSHA), California Department of Health Services, and San Bernardino County Environmental Health Services.

PART I

BIOHAZARD MANAGEMENT IN THE LABORATORIES

CALIFORNIA STATE UNIVERSITY SAN BERNARDINO

BIOHAZARD MANAGEMENT PLAN

PART I - BIOHAZARD MANAGEMENT IN THE LABORATORIES

A. PURPOSE

This Procedure provides guidance and requirements for the safe use of infectious materials in laboratory settings. This Procedure implements the recommendations of Center for Disease Control and National Institutes of Health, as stated in **Biosafety in Microbiological and Biomedical Laboratories** (referred to hereafter as the CDC-NIH Handbook).

B. RESPONSIBILITIES

1. Principal Investigators and Supervisors (including course instructors) who perform or oversee activities that utilize or produce infectious materials are responsible for:
 - (a) Assuring infectious materials are stored and handled in accordance with the criteria described below for the appropriate Biosafety Level and Universal Precautions.
 - (b) Assuring that the containment equipment and facility requirements for activities performed under their direction meet the criteria for the appropriate Biosafety Level.
 - (c) Training employees under their supervision on the proper handling and storage of infectious materials, and maintaining records of employee training.
 - (d) Periodic inspections of facilities to ensure compliance with all regulations and guidelines, and maintaining records.
 - (e) Ensuring that infectious wastes are managed in accordance with Part III of the Biohazard Management Plan, **BIOHAZARDOUS WASTE MANAGEMENT**.
 - (f) Registering work involving etiologic agents and potentially hazardous protocols with the Institutional Animal Care & Use Committee or EH&S prior to commencement of work.
2. Environmental Health & Safety is responsible for:
 - (a) Developing campus requirements and guidelines for biohazard control, which are consistent with applicable Federal, State, and local regulations, and guidelines.
 - (b) Coordinating the University's Biohazardous Waste Management Program as described in Part III of this procedure.
 - (c) Performing random audits of specific biohazard material handling activities to assess compliance with this procedure

3. The Institutional Animal Care & Use Committee is responsible for:
- (a) Reviewing and approving all proposed research activities which are potentially biohazardous.
 - (b) Helping ensure that requirements and guidelines developed by EH&S for application at CSUSB are followed.
 - (c) Ensure that all facets of a research protocol conform with applicable regulations and guidelines.

TERMINOLOGY AND PRINCIPLES OF BIOSAFETY

1. BIOSAFETY LEVELS

Four biological safety levels (BSL) are described in the CDC-NIH Handbook, which consist of a combination of laboratory practices and techniques, safety equipment, and laboratory facilities appropriate for the operations performed and the hazard posed by the infectious agents in question. These levels are designated in ascending order, by degree of protection provided to personnel, the environment, and the community (i.e., *BSL 1-4*). A description of BSL 1 and 2 with criterias and associated laboratory control measures is presented below. BSL 3 & 4 is not described, because CSUSB currently cannot facilitate at these levels.

2. CONTAINMENT

The principles of biohazard control center on the concept of *containment*, which refers to safe methods for managing infectious agents in the laboratory environment where they are being handled or maintained. *Primary containment* involves the protection of personnel in the immediate laboratory environment from exposure to infectious agents, and is provided by good microbiological technique, the use of proper safety equipment, and appropriate vaccines. *Secondary containment* refers to the protection of the environment external to the laboratory from exposure to infectious materials, and is provided by a combination of facility design and operational practices. The three major elements of containment are:

Laboratory practice and technique;

Use of enclosed containers such as Biological Safety Cabinets or other enclosures as primary barriers;

Proper design of laboratories facilities (basic, containment, and maximum containment) as secondary barriers.

3. BIOSAFETY CABINETS

Biological Safety Cabinets (sometimes called *Biosafety Cabinets*) are among the most effective and widely used devices for providing primary containment. The three types of biosafety cabinet's - Class I, II, and III - have varying design and performance characteristics. Class I biosafety cabinets, when used in conjunction with good microbiological techniques, provide an effective partial containment system for the safe manipulation of low to moderate risk

microorganisms (i.e., BSL 2 agents). Class II cabinets are acceptable for work with moderate to high-risk agents (i.e., BSL 2 and 3).

All Class I and II biosafety cabinets must be tested and certified on site at the time installation in the laboratory is complete, any time the biosafety cabinet is moved, and at least annually thereafter. All laboratory personnel must be trained in the proper use of these devices. (See Appendix A of the CDC-NIH Handbook for a description of the design and use of biosafety cabinets.)

D. LABORATORY BIOSAFETY LEVEL CRITERIA

Essential elements of the two biosafety levels applicable to CSUSB for activities involving infectious microorganisms and laboratory animals are described below. A synopsis of requirements pertaining to the general use of infectious materials is presented in Table 1 of the CDC-NIH Handbook.

Biosafety Level 1

Biosafety Level 1 practices, safety equipment, and facilities are appropriate for most undergraduate training and teaching laboratories, and for other facilities in which work is done with defined and characterized strains of viable microorganisms not known to cause disease in healthy adult humans.

Biosafety Level 1 controls are suitable for work involving agents of no known or of minimal potential hazard to laboratory personnel and the environment. The laboratory is not separated from the general traffic patterns in the building. Work is generally conducted on open bench tops. Special containment equipment is not required or generally used. Laboratory personnel have specific training in the procedures conducted in the laboratory and are supervised by a scientist with general training in microbiology or related science.

The following standard and special practices, safety equipment, and facilities apply to agents assigned to BSL:

1. STANDARD MICROBIOLOGICAL PRACTICES

- (a) Access to the laboratory is limited or restricted at the discretion of the laboratory director when experiments are in progress.
- (b) Work surfaces are decontaminated once a day and after any spill of viable material.
- (c) All contaminated liquid or solid wastes are decontaminated or disposed of in accordance with Part III of this Plan.
- (d) Mechanical pipetting devices are used; pipetting by mouth is strictly prohibited.
- (e) Eating, drinking, smoking, and applying cosmetics are not permitted in the work area. Food may be stored in cabinets or refrigerators designated and used for this purpose only. Food storage cabinets or refrigerators should be located outside of the work area.

- (f) Persons wash their hands after they handle viable materials and animals and before leaving the laboratory.
- (g) All procedures are performed carefully to minimize the creation of aerosols.
- (h) Laboratory coats, gowns, or uniforms should be worn to prevent contamination or soiling of street clothes.

2. SPECIAL PRACTICES

- (a) **Medical waste contaminated materials that are to be decontaminated at a site away from the laboratory are placed in a red biohazard bag, properly closed and labeled, before being removed from the laboratory.**
- (b) An insect and rodent control program is in effect.

3. CONTAINMENT EQUIPMENT

Special containment equipment is generally not required for manipulations of agents assigned to Biosafety Level 1.

4. LABORATORIES FACILITIES

- (a) The laboratory is designed so that it can be easily cleaned.
- (b) Bench tops are impervious to water and resistant to acids, alkalis, organic, solvents, and moderate heat.
- (c) Laboratory furniture is sturdy. Spaces between benches, cabinets, and equipment are accessible for cleaning.
- (d) Each laboratory contains a sink for hand washing.
- (e) If the laboratory has windows that open, they are fitted with fly screens.

Biosafety Level 2

Biosafety Level 2 is similar to BSL 1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment. It differs in that (1) laboratory personnel have specific training in handling pathogenic agents and are directed by competent scientists, (2) access to the laboratory is limited when work is being conducted, and (3) certain procedures in which infectious aerosols may be created are conducted in biological safety cabinets or other physical containment equipment. Examples of BSL 2 agents include:

Human nematode, protozoal, trematode, and cestode parasites (e.g., *Strongyloides* spp, hookworms, *Plasmodium* spp, *Toxoplasma* spp, *Schistosoma* spp, *Fasciola* spp, *Echinococcus granulosus*, and *Taenia solium*).

Certain fungal agents such as *Cryptococcus neoformans* and *Sporothrix schenckii*
Certain viral agents such as Hepatitis A, B, non-A, and non-B, Herpes viruses, Influenza,

Polioviruses, Poxviruses, and Rabies Virus (Exceptions: activities with high potential for producing aerosols of some of these agents, or concentrating virus in quantities greater than 1 liter may require BSL 3).

The following standard and special practices, safety equipment, and facilities apply to agents assigned to BSL 2:

1. STANDARD MICROBIOLOGICAL PRACTICES

- (a) Access to the laboratory is limited or restricted by the PI or Lab Supervisor when work with infectious agents is in progress.
- (b) Work surfaces are decontaminated at least once a day and after any spill of viable material.
- (c) All infectious liquid or solid wastes are decontaminated or disposed of in accordance with Part III of this Plan.
- (d) Mechanical pipetting devices are used; pipetting by mouth is prohibited.
- (e) Eating, drinking, smoking, and applying cosmetics are not permitted in the work area. Food may be stored in cabinets or refrigerators designed and used for this purpose only. Food storage cabinets or refrigerators should be located outside of the work area.
- (f) Persons wash their hands after handling infectious materials and animals and when they leave the laboratory.
- (g) All procedures are performed carefully to minimize the creation of aerosols.

2. SPECIAL PRACTICES

- (a) Contaminated materials that are to be decontaminated from medical waste, at a site away from the laboratory are placed in a **red biohazard bag** before being removed from the laboratory.
- (b) The PI or Lab Supervisor limits access to the laboratory. In general, persons who are at increased risk of acquiring infection or for whom infection may be unusually hazardous are not allowed in the laboratory or animal rooms. The PI or Supervisor has the final responsibility for assessing each circumstance and determining who may enter or work in the laboratory.
- (c) The PI or Lab Supervisor establishes procedures whereby only persons who have been advised of the potential hazard and meet any specific entry requirements (e.g., immunization) enter the laboratory or animal rooms.
- (d) When the infectious agent(s) in use in the laboratory require special provisions for entry (e.g., vaccination) a hazard warning sign, incorporating the universal biohazard symbol, is posted on the access door to the laboratory work area. The hazard warning sign identifies the infectious agent, lists the name and

telephone number of the laboratory director or other responsible person(s), and indicates the special requirement(s) for entering the laboratory. (See Figure 1).

- (e) An insect and rodent control program is in effect.
- (f) Laboratory coats, gowns, smocks, or uniforms are worn while in the laboratory. Before leaving the laboratory for any nonlaboratory area (e.g., cafeteria, library, administrative offices), this protective clothing is removed and left in the laboratory, or covered with a clean coat not used in the laboratory.
- (g) Animals not involved in the work being performed are not permitted in the laboratory.



Special Procedures or Precautions for Entry [Bldg. _____ Room _____ Posted _____]					Date _____
Notice	Call or See	Bldg.	Room	Work Phone	Home Phone
Entry or Advice					()
Emergency					()
Emergency					()

Figure 1. Biohazard Warning Sign.

- (h) Special care is taken to avoid skin contamination with infectious materials; gloves should be worn when handling infected animals and when skin contact with infectious materials is unavoidable.
- (i) All materials from laboratories and animal rooms are appropriately decontaminated before disposal. Hypodermic needles and syringes are used only for parenteral injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units (i.e., needle is integral to the syringe) are used for the injection or aspiration of infectious fluids. Extreme caution should be used when handling needles and syringes to avoid auto inoculation and the generation of aerosols during use and disposal. Needles should not be bent, sheared, replaced in the sheath or guard, or removed from the syringe following use. The needle and syringe should be promptly placed in a puncture-resistant sharps container and disposed following the procedures on Part III of this Plan.
- (k) Spills and accidents which result in overt exposures to infectious materials are immediately reported to the PI or Lab Supervisor. Medical evaluation, surveillance, and treatment are provided as appropriate and written records are maintained.
- (l) When appropriate, considering the agent(s) handled, baseline serum samples for laboratory and other at-risk personnel are collected and stored. Additional serum specimens may be collected periodically, depending on the agents handled or the function of the lab. The P.I. is responsible for determining this need.
- (m) A formal, written Biosafety Program is prepared or adopted. Personnel are trained and advised of special hazards and are required to read instructions on practices and procedures and to follow them. Failure to follow appropriate practices should result in disciplinary action.

3. CONTAINMENT EQUIPMENT

Biological safety cabinets (Class I or II) or other appropriate personal protective or physical containment devices are used whenever:

- (a) Procedures with a high potential for creating infectious aerosols are conducted. These may include centrifuging, grinding, blending, vigorous shaking or mixing, sonic disruption, opening containers of infectious materials whose internal pressures may be different from ambient pressures, intranasal inoculation of animals, and harvesting infected tissues from animals or eggs.
- (b) High concentrations or large volumes of infectious agents are used. Such materials may be centrifuged in the open laboratory if sealed heads or centrifuge safety cups are used and if they are opened only in a biological safety cabinet.

4. LABORATORY FACILITIES

- (a) The laboratory is designed so that it can be easily cleaned.
- (b) Bench tops are impervious to water and resistant to acids, alkalis, organic solvents, and moderate heat.
- (c) Laboratory furniture is sturdy, and spaces between benches, cabinets, and equipment are accessible for cleaning.
- (d) Each laboratory contains a sink for hand washing.
- (e) If the laboratory has windows that open, they are fitted with fly screens.
- (f) An autoclave for decontaminating infectious laboratory materials is available.

Biosafety Level 3 and Biosafety Level 4

Currently, no facilities at CSUSB meet the minimum requirements and criteria for BSL 3 or BSL 4.

E. ADDITIONAL REQUIREMENTS FOR LABORATORY ANIMALS

If experimental animals are used, the biosafety procedures must also address facility and operational requirements that will reasonably assure appropriate level of environmental quality, safety, and care. Laboratory animal facilities should be considered extensions of the laboratory. Indeed, in some cases they are integral to and inseparable from laboratory operations. Regardless of the physical arrangement, laboratory animal facilities, operational practice, and quality of animal care should meet the standards prescribed in **Guide for the Care and Use of Laboratory Animals**, HHS Publication No. 86-23, Rev. 1985, and **Laboratory Animal Welfare Regulation - 9 CFR, Subchapter A, Parts 1, 2, and 3**. Additional recommendations (which should be considered "requirements") for the various biosafety levels are presented in the CDC-NIH Handbook. The CDC-NIH requirements should be consulted for any activities involving infected vertebrate animals. A synopsis of these requirements is presented in Table 2 of the CDC-NIH Handbook.

F. BLOOD-BORNE PATHOGENS

Special requirements are in place to control infection of workers by certain blood-borne pathogens such as HIV, Hepatitis-B, or Hepatitis C. The procedure to comply with these requirements is presented as Part II of the Biohazard Management Plan.

G. BIOHAZARDOUS WASTE MANAGEMENT

All laboratory operations must comply with the CSUSB procedure for Biohazardous Management, which is presented as Part III of the Biohazard Management Plan unless equally protective alternative procedures are approved.

For Further Information

Additional information on safe handling practices and associated requirements can be obtained from EH&S. Contact EH&S (ext. 75179) for copies of applicable regulations or further information.

PART II

EXPOSURE CONTROL PROGRAM FOR

BLOOD-BORNE PATHOGENS

CALIFORNIA STATE UNIVERSITY SAN BERNARDINO

BIOHAZARD MANAGEMENT PLAN

PART II - EXPOSURE CONTROL PROGRAM FOR BLOOD-BORNE PATHOGENS

A. PURPOSE

To establish the requirements for preventing potential exposure to blood-borne pathogens and infectious waste in the workplace through education, training, and compliance with guidelines from the Center for Disease Control (CDC), Federal Occupational Safety and Health Administration (OSHA), 29 CFR 1910.1030, (Appendix II-A) and the California OSHA, 8 CCR 5193.

B. DEFINITIONS

(1) Blood-Borne Pathogens

Certain pathogenic microorganisms found in the blood of infected individuals that can be transmitted from the infected individual to through blood and other body fluids to cause blood-borne diseases specifically Hepatitis B Virus (HBV), Hepatitis C (HCV) and AIDS Human Immunodeficiency (HIV).

(2) Disinfect

To inactivate virtually all recognized pathogenic microorganisms.

(3) Employee With Potential for Exposure

Any CSUSB employee whose work may involve direct contact with blood, blood products, and other body fluids.

(4) Exposure Incident

Contact with eye, mouth, or other mucous membrane, non-intact skin, or parenteral (needle) contact with blood or other potentially infectious materials that may occur in the performance of employee duties.

(5) Exposure Control Program (ECP)

CSUSB's second part of the Biohazard Management Plan provides Procedures used to minimize employees' exposure to blood-borne pathogens such as Hepatitis B Virus (HBV), Hepatitis C (HCV), and Human Immunodeficiency Virus (HIV).

(6) Infectious Waste

Includes blood, blood products, contaminated sharps (needles, etc.), pathological waste, and microbiological waste.

(7) Other Potentially Infectious Materials (OPIM)

The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any other body fluid that is visibly contaminated with blood such as saliva or vomitus, and all body fluids in situation where it is difficult or impossible to differentiate between body fluids such as emergency response; any unfixed tissue or organ (other than intact skin) from a human (living or dead; and any of the following, if know or reasonably likely to contain or be infected with HIV, HBV, HCV: cell tissue, or organ cultures from humans or experimental animals; blood, organs, or other tissues from experimental animals; or culture medium or other solutions.

(8) OSHA Categories For Exposure

Category 1 Employees whose tasks involve exposure to blood or body fluids.

Category 2 Employees whose tasks involve no exposure to blood or body fluids but whose employment may require unplanned Category 1 procedure.

Category 3 Employees whose tasks involve no exposure to blood or body fluids.

(9) Sterilants

EPA registered chemical procedure to destroy microbial life. Contact EH&S for products list.

(10) Universal Precautions

A method of infection control in which all human blood and other potentially infectious material are treated as hazardous and known to be infectious for Hepatitis B Virus (HBV), Hepatitis C (HCV), and Human Immunodeficiency Virus (HIV).

C. GENERAL

Blood-borne pathogens may be present whenever blood or other potentially infectious material are present. Two of the most significant blood-borne pathogens, Hepatitis B Virus (HBV), Hepatitis C (HCV), and Human Immunodeficiency Virus (HIV), have been recognized as pathogens capable of causing serious illness and even death. Because viruses are transmitted through blood and certain body fluids, employees who routinely handle these as part of their job have increased risk of contracting blood-borne diseases.

The most efficient mode of transmitting blood borne pathogens to workers is by direct inoculation such as might occur with a needle stick or injury from another sharp instrument. Moreover, infected employees may transmit the pathogens to others. It is known that exposure to extremely small amounts of HBV-positive blood may transmit

infection. Blood and blood-derived body fluids contain the highest quantities of virus and are likely vehicles for HBV transmission.

HIV has been isolated from human blood, semen, breast milk, vaginal secretions, tears, and urine. However, at the present time, epidemiological evidence implicates only blood, semen, breast milk, and vaginal secretions, in the transmission of the virus. It is not known whether HIV is transmitted by casual contact. Exposure to HIV contaminated blood is the most likely mode of transmission.

The Biohazard Management Plan and Exposure Control Program serve as a guide for preventing potential exposure to blood-borne pathogens and infectious waste in the workplace. The Plan and the Program address the issue of preventing exposure to blood-borne pathogens through education and training. CSUSB's enforcement of the Exposure Control Program will provide a safe and healthy environment for all its employees.

D. EXPOSURE RESPONSE, PREVENTION AND CONTROL

(1) EXPOSURE CONTROL PLAN (ECP)

- a. CSUSB shall establish, implement and maintain effective exposure control plan that is designed to eliminate or minimize employee exposure and that is consistent with Title 8 CCR 5193.
- b. Exposure control plan shall be in writing and will contain:
 - Exposure Determination;
 - Schedule and Method of implementation of Plan;
 - Method of Compliance;
 - Hepatitis B Vaccination and Post-Exposure Evaluation and Follow-up;
 - Communication of Hazard to Employees;
 - Record keeping;
 - Procedure for the evaluation of circumstances surrounding exposure incidences;
 - An effective procedure for gathering information required by sharp injury log;
 - Effective procedure for periodic determination of the frequency of use of the type and brand of sharp involved in the incidents documented on the Sharp Injury Log;
 - An effective procedure for identifying current available engineering controls and selecting such controls where appropriate; and,
 - An effective procedure for documenting patient safety determinations.
- c. Employee will eliminate or minimize employee occupational exposure to blood or certain other body fluids.
- d. The plan will comply with the Bloodborne Pathogens Standard. (Title 8 CCR 5193).

This plan is divided into the following sections.

1. Exposure Determination
2. Protective Equipment Requirements
3. Cardiopulmonary Resuscitation (CPR) Equipment and Care
4. Disinfection Process
5. Disposal of Infectious Waste
6. HBV and Post-Exposure Evaluation and Follow-up
7. Training and Record keeping

1. Exposure Determination

- a. Occupational exposure to blood or other potentially infectious materials (OPIM): Employee classification shall be determined by representatives from Human Resources, Health Center and Environmental Health and Safety.
- b. The following lists job title and the exposure category related to that employee:

CSUSB JOB CLASSIFICATIONS & ASSIGNED EXPOSURE CATEGORIES

1 - Athletic Coach / Trainer (AA, PE)	3 - Parking Services Officer (AF, PS)
2 - Animal Handler (AA, CNS)	1 - Physician (SA, HC)
1 - Biohazard Waste Technician (AA, CNS)	2 - Plumber (AF, FS)
2 - Building Service Engineer (AF, FS)	2 - Police Officer (AF, UP)
1 - Clinical Aid / Laboratory Technician (SA, HC)	2 - Principal Investigator (AA, CNS)
1 - Custodian (AF, FS)	1 - Nurse (SA, HC)
1 - EHS Officer / Specialist (AF, FS)	1 - Nursing Faculty (AA, CNS)
3 - Equipment Technician (AA, CAL, Music)	3 - Radiation Safety Personnel (AA, CNS)
3 - Instructional Support Technician (AA, CNS)	3 - Researchers (CNS)
2 - Light Urban Search & Rescue (LUSR) Team	3 Student Employees (any that may apply)

Legend:

AA – Academic Affairs Division
AF – Administration & Finance Division
SA – Student Affairs Division
CAL – College of Arts & Letters
CNS – College of Natural Sciences

FS – Facilities Services
HC – Health Center
PE – Physical Education
PS – Parking Services
UP – University Police

- c. Universal precautions will be observed at all times in order to prevent contact with blood or OPIM. All blood and OPIM will be considered infectious regardless of the perceived status of the source individual.

2. Protective Equipment Requirements

- a. Personal Protective Equipment (PPE) is specialized clothing or equipment worn by an employee for protection against hazards. This can include mask, lab coats gowns, face shields/mask, eye, protection etc.
- b. CSUSB will provide and require the use of gloves as a protective barrier in all laboratories, first aid and emergency situations in which body fluids are handled.

The use of gloves as a personal protective measure is important in the following situations:

- If employee has cuts, abraded skin, chapped hands, or dermatitis.
- When examining abraded or non-intact skin, or patient has active bleeding.
- During cleaning of bodily fluids and decontaminating procedures.

Gloves shall also be worn when it can be reasonably anticipated that the employee may have contact with blood and OPIM (e.g. custodian, plumber). Only gloves that are of appropriate quality for the procedure and the appropriate size for workers shall be used. Wash hand with microbacterial soap after removing gloves.

- c. Masks, Eye Protection, and Face Shields. Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.
- d. Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated.
- e. Personal Protective Equipment, where necessary, shall be provided by the department at no cost to the employee.
- f. Employees failing to utilize any safety equipment deemed necessary by the supervisor shall be disciplined.
- g. Supervisors shall ensure accessibility and proper usage of PPE.
- h. Dispose of gloves or contaminated PPE in infectious waste container (see Part III "Biohazardous Waste Management" for information on disposal of infectious waste).

3. Cardiopulmonary Resuscitation (CPR) Equipment and Care

- a. Maintain a supply of cardiopulmonary resuscitation (CPR) mouth piece devices in the Health Center.

In addition, pocket masks, resuscitation bags, or other ventilation devices should be provided in strategic locations.
- b. Provide cardiopulmonary resuscitation (CPR) mouthpiece devices for use in resuscitation to employees certified in CPR.
- c. Sterilize nondisposable ventilation bag/mask.
 - Disassemble bags.
 - Soak in disinfecting solution of chlorine for 30 minutes.
 - Rinse, and allow to air dry.

4. Disinfection Process

- a. Clean and disinfect all surfaces immediately after contact with blood or potentially infectious material. The Medical Waste Management Act requires thorough washing and decontamination through rinsing and/or immersion of surfaces and/or articles in hypochlorite solution with 500 ppm available chlorine, or other effective disinfectants.
 - Wear appropriate PPE (e.g. gloves)
 - Use disposable cloth for cleaning.
 - Place all used material into a properly labeled "Biohazard" bag.
 - Wash hands.

NOTE: Use only gloves that are appropriate for the task (e.g. latex, vinyl, etc.)

- b. Disinfect, on a routine basis, all cans or receptacles intended for reuse which have potential of becoming contaminated with blood or other body fluids.
- c. Use heavy-duty latex gloves for disinfecting blood spills or potential infectious bodily fluids.
- d. Dispose of gloves in infectious waste container (see Part III of this Plan for information on disposal of (infectious waste).
- e. Wash hands with microbacterial soap after removing gloves.

5. Disposal of Infectious Waste

Follow procedures in Part III Biohazardous Waste Management for proper disposal of Infectious Waste.

6. Hepatitis B Vaccine and Post-Exposure Evaluation and Follow-U12

- a. CSUSB shall make available free of charge the Hepatitis B vaccine and vaccination series to all employees who have reasonable potential for occupational exposure, and post exposure follow-up to employees who have had an exposure incident.
- b. All medical evaluations and procedures including the Hepatitis B vaccine and vaccination series and post-exposure follow-up are:
 - i.) Made available to no cost to the employee;
 - ii.) Made available to the employee at a reasonable time and place;
 - iii.) Performed by or under the supervision of a licensed physician;
 - iv.) Provided according to the recommendations of the U.S. Public Health Service (PHS).

- c. All laboratory tests shall be conducted by an accredited laboratory at no cost to the employee.

If the employee initially declines Hepatitis B vaccination but at a later date while still covered under the standard decides to accept the vaccination, the vaccination shall then be made available at no cost.

All employees who decline the Hepatitis B vaccine offered shall sign the OSHA required waiver indicating their refusal.

If a routine booster dose of Hepatitis B vaccine is recommended by the U.S. Public Health Service (USPHS) at a future date, such booster doses shall be made available at no cost.

- d. Exposure incident means specific eye, mouth, or other mucous membranes, non-intact skin, or parenteral contact with blood or OPIM that resulted from the performance of duties.

All exposure incidents shall be reported, investigated, and documented. When the employee incurs an exposure incident, it shall be reported to the:

- Supervisor
- Student Health Center
- EH&S

- e. Following a report of an exposure incident, the exposed employee shall immediately receive a confidential medical evaluation and follow-up, including at least the following elements:
 - i.) Documentation of the route of exposure, and the circumstances under which the exposure incident occurred;
 - ii.) Identification and documentation of the source individual, unless it can be established that identification is infeasible or prohibited by law;
 - iii.) The source individual's blood shall be tested as soon as feasible and after consent is obtained in order to determine HBV and HIV infectivity;
 - iv.) Post exposure prophylaxes, as recommended by USPHS;
 - v.) Counseling;
 - vi.) Evaluation of reported illnesses.

7. Training and Record keeping

- a. Departments shall determine exposure risk from job classifications into appropriate categories (See List 1-b).
- b. Departments shall establish an Education and Training Program on possible exposure to blood-borne pathogens. Training records should include the

following:

- Dates of training;
 - Summary of training session;
 - Name of person conducting training and those in attendance;
 - Maintain records for three years;
 - Provide EH&S Office with copies for central file.
- c. Cover the following areas in the ECP training:
- Copy and Explanation of Standard;
 - Epidemiology and Symptoms;
 - Modes of Transmission;
 - Employer's Exposure Control Plan;
 - Risk Identification;
 - Methods of Compliance;
 - Decontamination and Disposal;
 - Personal Protective Equipment;
 - Hepatitis B Vaccination;
 - Emergency;
 - Exposure Incident;
 - Post-Exposure Evaluation and Follow-up;
 - Signs and labels;
 - Interactive Questions and Answers.
- d. Identify body fluids which present a risk for employees.
- e. Describe proper disposal of infection waste and sharps (needles, etc.) based on "Part III Biohazardous Waste Management".
- f. Provide education and training on PPR to all affected employees.
- g. Offer HBV vaccine to workers who are exposed on an average of one or more times per month to blood-borne pathogens.
- h. Maintain proper record keeping of employees accepting or waiving HBV vaccine.
- i. Establish and maintain records of each employee exposed to bloodborne pathogens include the following:
- Name and Social Security Number of employees
 - Copy of employee's HBV or waiver of vaccination
 - Record of any exposure incident
 - Copy of physical findings and follow-up procedure as it relates to incident

NOTE: Records are to be kept confidential. They are to be kept for the duration of employment plus 30 years.

Education and training of affected personnel

- j. Make available the medical evaluation and follow-up of employee in the event of exposure to blood-borne pathogens or bodily fluids.
- k. Follow-up procedures after possible exposure incident shall follow recommendations of the United States Public Health Service and comply with T 8 CCR 5193.

E. RESPONSIBILITIES

1. Department Supervisors

Is responsible for identification of affected students/employees, education and training, inspections, medical requirements and overall ECP compliance.

2. Health Center

Is responsible for implementing the ECP and providing the University students and employees the necessary medical requirements (e.g. HBV vaccinations).

3. Environmental Health and Safety

Is responsible for developing CSUSB's ECP, coordinating ECP implementation, central recordkeeping and performing periodic audits for compliance.

F. PROCEDURES - SPECIFIC, BY AREA

These procedures are designed to be specific for the area listed. However, some situations may not have been covered in the procedure. If there are any questions, contact Environmental Health and Safety.

1. University Police

During a medical emergency that may expose the responding Officer to human body fluids, the following pre-response precautions must be taken:

- a. All police units shall be equipped with, at a minimum, the following Personal Protective Equipment (PPE), contained in a portable kit:
 - Surgical Gloves
 - Large Zip Lock Bags for storage of used PPE
 - Red Infectious Waste/Biohazard Disposal Bags
 - Non-contact Ventilators/Pocket Respirators
 - Goggles
 - General First Aid Equipment (bandaids, gauze, tape, etc.)
 - Sanitary Wipes
- b. Officers shall inspect their vehicle for the presence of PPE prior to the beginning of their shift.

- C. In the event of a medical emergency that requires the administration of first aid by the Officer, the PPE kit shall be carried to the first aid location and appropriate PPE donned prior to administering first aid.
- d. Goggles must be donned when the likelihood of exposure due to the splashing or splattering of body fluids is present.
- e. After the response is completed, the used contaminated materials shall be stored in **red biohazard bag** and disposed of as infectious waste at the Student Health Center Infectious Waste Storage Area.
- f. Any Officer that receives exposure during the administration of first aid shall be included in the Post Exposure Evaluation and Follow-Up identified in section D-6(d) of this Plan.
- g. Clothing that becomes soiled with human body fluids shall be handled with gloves and placed in a **linen bag for decontamination or a red biohazard bag for disposal**. Advise supervisor and or EH&S.

2. Criminal Investigation - Evidence Handling

Evidence which presents an infectious exposure hazard (i.e. Human Body Fluids) shall be handled as follows:

- a. Evidence shall be handled in accordance with DOJ guidelines.
- b. Where possible, potentially infectious evidence shall be handled with tweezers, tongs, etc.
- c. The investigator handling the evidence shall wear protective gloves (surgical).
- d. Other Personal Protective Equipment (masks, face shields, lab coats, goggles, etc.) shall be worn when the collection of evidence may result in the splashing, splattering, or spraying of human body fluids, or if the investigator otherwise feels that such protections is warranted.
- e. Evidence shall be placed in resealable containers such as zip lock bags, ample bottles, etc.
- f. Evidence containers shall be marked "Infectious Evidence."
- g. Evidence shall be handled by trained personnel only.
- h. Evidence shall be stored in a laboratory type refrigerator which has a warning on the door that states "Infectious Materials Inside".
- i. Disregarded infectious evidence shall be disposed of through the Student Health Center. All handling etc. shall be in accordance with Part III "Biohazardous Waste Management Plan".

3. Athletic Trainers

Injuries often occur during athletic events. In instances where the injury results in evulsions, cuts, compound fractures, etc. (where human body fluid other than sweat is present), special first aid precautions must be taken.

- a. A portable first aid kit containing the equipment listed in Section 1 must be available at all athletic events.
- b. Personal Protective Equipment, when appropriate, must be used when providing first aid.

4. Medical Personnel

- a. All medical personnel should wear lab coats when working with patients.
- b. Gloves must be donned when examining sores, wounds, sutures, or other body cavities where body fluids may be transferred to the examining medical professional.
- c. Goggles and masks must be donned when the likelihood of exposure due to the splashing, spraying or splattering of body fluid is present.

5. Phlebotomy

- a. Protective gloves shall be worn.
- b. Other protective clothes shall be available for the worker's use (goggles, apron, etc.)
- c. Needles and lancets shall not be recapped or broken.
- d. Place used sharp needles and lancets in the puncture proof "sharps container" provided in the work area.

PART III

BIOHAZARDOUS (INFECTIOUS) WASTE MANAGEMENT

CALIFORNIA STATE UNIVERSITY SAN BERNARDINO

BIOHAZARD MANAGEMENT PLAN

PART III - BIOHAZARDOUS (INFECTIOUS) WASTE MANAGEMENT

A. PURPOSE

The purpose of this procedure is to provide guidance and describe requirements for the proper management of potentially infectious materials and waste products. Requirements for generators of infectious waste are prescribed in the California Code of Regulations (CCR), Title 22, Article 13, and the California Health and Safety Code. Implementation of this Program will ensure that all infectious wastes generated by CSUSB facilities and activities are managed in consonance with good health and safety practices and in compliance with applicable regulations.

B. DEFINITIONS

1. Biohazardous Waste

Also called infectious Waste as defined by the California Health and Safety Code, and San Bernardino County Ordinance means any of the following:

Laboratory wastes, including but not limited to, specimen cultures from medical and pathological laboratories, cultures or stocks of infectious agents from research laboratories, and other etiologic agents which pose a substantial threat to health due to their volume and virulence.

Waste from the production of bacteria, viruses, or the use of spores discarded live, attenuated vaccines, and culture dishes and devices used to transfer, inoculate, or mix cultures.

Surgical or pathologic specimens, including human and animal parts and tissues removed surgically or at autopsy, which contain etiologic agents and attendant disposable fomites.

Equipment, instruments, utensils, and other disposable materials which are likely to transmit etiologic agents from the rooms or the enclosures of animals, which have been isolated because of suspected or diagnosed communicable disease.

Carcasses, tissues, or fluids or fluid bloods of animals or humans infected with etiologic agents which may present a substantial hazard to public health if improperly managed.

Any other material which, in the determination of the EH&S Officer or responsible individual presents a significant danger of infection because it is contaminated with, or may be reasonably expected to be contaminated with, etiologic agents.

2. Medical Waste

Infectious biohazardous waste or sharps waste.

Waste which is produced or generated as a result of the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biological agents.

3. Biomedical Solid Waste

Includes, but is not limited to, empty specimen containers, bandages, dressings containing non-liquid blood, surgical gloves, decontaminated infectious waste, and other materials which are not considered infectious.

C. RESPONSIBILITIES

1. Supervisors managing activities which generate biohazardous wastes (e.g., Principal Investigators, Lab Supervisors) are responsible for:

- (a) Assuring infectious wastes are stored, handled, and disposed of according to this procedure.
- (b) Training employees under their supervision on the proper handling and storage of infectious materials.
- (c) Periodic inspection of inspections and facilities to ensure regulatory compliance.
- (d) Maintaining records of employee training.
- (e) Maintaining up to date documentation of standard operating procedures, including annual thermometer calibrations and monthly application of Bacillus stearothermophilus (a biological indicator), for each autoclave or other approved sterilization device.

2. Environmental Health & Safety is responsible for:

- (a) Developing campus requirements and guidelines, for infectious waste which are consistent with applicable Federal, State, and local regulations and guidelines.
- (b) Preparing, documenting, and coordinating the implementation of University's Biohazardous Waste Program, in accordance with the California Health and Safety Code.
- (c) Approving specific on-site treatment and procedures (e.g., autoclaving or other approved sterilization techniques) used to decontaminate infectious equipment.
- (d) Performing audits of specific waste generating facilities or activities to assess compliance with this procedure.

- (e) Promoting guidance to area supervisors as the proper compliance procedures.
- (f) Arranging for appropriate disposal of medical wastes.

D. REQUIREMENTS

1. CONTAINMENT AND STORAGE

- (a) Potentially infectious material must be securely contained within Biohazardous Waste Bags ("Red Bags") according to the following:
 - (1) Biohazardous waste must be segregated from other types of waste at the point of origin.
 - (2) Biohazardous waste should be "double-bagged" if it contains partially saturated solid waste.
 - (3) Bags containing Biohazardous waste must be red in color, and be labeled either as "Biohazardous Waste," or with the international symbol and the word "Biohazard."
 - (4) Bags must be certified by the manufacturer to meet the minimum strength requirements of CCR, Title 22, Article 13, section 66840(f), and ASTM Standard D 1709-75.
 - (5) Bags must be securely tied so as to prevent leakage or expulsion of the contents during handling, transportation, or storage.
 - (6) Bags should be labeled with the name of originating department.
 - (7) Any spill or leak of a medical/infectious waste must be decontaminated by appropriate procedures, (See Part 11 of this Plan).
 - (8) Pathological Waste Labeled containers will not be used for any waste other than pathological waste.**
- (b) Sharps, which are used needles, syringes, or other objects having acute rigid corners or protuberances capable of cutting or piercing, shall be placed in containers which meet the following requirements:
 - (1) Container must be leak proof, rigid, puncture resistant, and tightly lidded or taped closed to prevent loss of contents and to secure for disposal.
 - (2) Container, once sealed, cannot be reopened without great difficulty.

- (3) Sharps containers must be labeled in the same way as infectious waste bags, or be placed in infectious waste bags.
- (4) Needle and syringe tips shall not be clipped prior to disposal.
- (5) Needles and syringes shall not be recapped. The entire unit shall be immediately placed in an approved sharps container after use.
- (c) Use of Secondary Containers
 - (1) All disposable infectious waste bags and sharps containers must be placed in secondary containers such as pails, cartons, drums, dumpsters, or bins for storage.
 - (2) Secondary containers must be leak proof, have tight-fitting covers, and be kept clean and in good repair.
 - (3) Secondary containers must be labeled on the lid and sides with the words, "Biohazardous Waste," or with the international biohazard symbol and the word, "Biohazardous."
 - (4) Reusable secondary containers must be easily cleanable, and must be washed and decontaminated each time they are emptied, unless they have been completely protected from contamination. The cleaning method should be approved by EHS for compliance with applicable State and local regulations.
- (d) Storage enclosures for bagged infectious waste must be secured to deny access to unauthorized personnel and exterior doors must be posted in both English and Spanish as follows:

CAUTION - INFECTIOUS WASTE STORAGE AREA -UNAUTHORIZED PERSONS KEEP OUT.

CUIDAD - ZONA DE RESIDUOS INFECTADOS - PROHIBIDA LA ENTRADA A PERSONAS NO AUTORIZADAS.

- (e) Biohazardous waste should not be stored in CSUSB facilities for more than four days at temperatures above 0 Degrees C (32 Degrees F.)

2. DISPOSAL OF BIOHAZARDOUS WASTE

- (a) Biohazardous waste generated by the University must be disposed of by being transferred off-campus with a registered hauler for disposal at a State-approved autoclave or incinerator.
- (b) Biohazardous wastes shall not be incinerated on-campus.
- (c) Recognizable human anatomical remains must be disposed of by off

campus incineration at authorized facilities.

3. DISPOSAL CONTRACT

Stericycle, Inc. is currently under contract to dispose of all CSUSB Biohazardous waste at their permitted facility. The contractor will collect medical wastes once a week from the Health Center and as necessary from the College of Natural Sciences where it is kept below 32 degree Fahrenheit. The contractor shall ensure that all sharps containers and all double-bagged infectious waste will be autoclaved, all animal carcasses will be incinerated, and all services are performed in strict accordance with applicable Federal, State, and local regulations. EHS will manage this contract and should be contacted at Ext. 75179 for any problems or modifications to this service.

4. AUTOCLAVING

Sterilization by heating in a steam sterilizer (autoclave), so as to render equipment noninfectious, is a method used at CSUSB to treat contaminated equipment before reuse. Infectious waste rendered noninfectious may be disposed of as biomedical solid waste if it does not contain any other hazardous properties. Operation of steam sterilizers, for equipment that does not contain any other hazardous properties, shall be in accordance with the following:

- (a) A written standard operating procedure (SOP) for each steam sterilizer should be prepared and followed. SOP should include time, temperature, pressure, type of waste, type of container(s), closure on container(s), pattern of loading, water content, and maximum load quantity.
- (b) Check of recording and/or indicating thermometers during each complete cycle to ensure the attainment of a temperature of 121 Degrees C (250 Degrees F) for one-half hour or longer, depending on quantity and compaction of the load, in order to achieve sterilization of the entire load. Thermometers shall be checked for calibration at least annually.
- (c) Use of heat sensitive tape or other devices for each container that is processed to indicate the attainment of adequate sterilization conditions.
- (d) Use of the biological indicator *Bacillus stearothermophilus* placed at the center of a load processed under standard operating conditions at least monthly to confirm the attainment of adequate sterilization conditions.
- (e) Maintenance of records of procedures specified in (a), (b), and (d) above for period of not less than three years.

For Further Information

Additional information on safe handling practices and associated requirements can be obtained from EH&S. Contact the EH&S Office (ext. 75179) for copies of applicable regulations or further information.