NOVA SOUTHEASTERN UNIVERSITY	ENVIRONMENTAL HEALTH AND SAFETY
POLICY/PROCEDURE TITLE: **Bloodborne Pathogens Exposure Control**	POLICY/PROCEDURE NUMBER: 1

TABLE OF CONTENT

DOCUMENT HISTORY

OWNER:	NSU Facilities Management	Date:1 Sept 2011
APPROVED:	NSU Facilities Management/AIHS	Date:1 Sept 2011
IMPLEMENTED:	Campus-wide	Date:1 Sept 2013
RETIRED:		Date:

Date:	**Revision No.**	**Review / Changes**	**Reviewer**
6 Aug 2013	1.0	Section 6. Category II security personnel removed and added to Category III	F. Wilson
6 Aug 2013	1.1	Section 11. #10 Campus Security is replaced with EHS.	F. Wilson
5 Aug 2016	2.0	Addition of Zika Virus to Appendix A	B. Welmaker
16 Nov 2018	3.0	Section 6 New Category I & II Job Exposure, updated Job Classification to include MOA	F. Wilson
16 Sept 2020	4.0	Addition Coronavirus(COVID-19) to Appendix A	F. Wilson

DOCUMENT DISTRIBUTION

Date:	**Distribution**	**# of Copies**

Distribution: The current version is available via NSU intranet. Paper copies of this document require prior approval before printing.

1. INTRODUCTION

The Occupational Safety and Health Administration (OSHA) issued the standard 29 CFR 1910.1030, "Occupational Exposure to Bloodborne Pathogens," to protect employees from exposures to bloodborne pathogens which include human body fluids that may be potentially contaminated with the human immunodeficiency virus (HIV), hepatitis C virus (HCV), hepatitis B virus (HBV) or any other bloodborne pathogens. The bloodborne pathogens exposure control policy should outline strategies and specific safe work practices for employees who work with human blood and body fluids. The requirements in this policy apply to all employees where occupational exposures to human blood, blood components, and other sources of bloodborne pathogens are anticipated. This policy also applies to individuals other than employees who may come into contact or be exposed to bloodborne pathogens such as faculty, students, visitors, contractors and vendors.

2. SCOPE AND REVIEW

Nova Southeastern University (NSU) is committed to providing and maintaining a safe and healthy working environment for its faculty, staff, and students. In support of this goal, the University is committed to developing and implementing health and safety programs for the benefit of its employees and students. This policy is an institution-wide program and applies to all Health Care Personnel, employees, faculty and students at NSU. Facilities included in this policy are clinical laboratories, research laboratories, dental clinics, and all other health care clinics and facilities operated by NSU faculty and staff. The Environmental Health and Safety (EHS) office will review this Exposure Control program on an annual basis and update as necessary.

3. REGULATORY REQUIREMENTS

The Exposure Control program is a key document to assist NSU in implementing and ensuring compliance with the OSHA standard 29 CFR1910.1030, thereby protecting all employees.

The standard requires employers to establish the exposure control program to consist of the following elements:

- Establish an exposure control program and determine all personnel's exposure category.
- Implementation of various methods of exposure controls.
- Universal precautions.
- Engineering and work practice controls.
- Personal protective equipment.
- Housekeeping and laundry.
- Hepatitis B vaccination.
- Post-exposure evaluation and follow-up procedures.
- Use warning labels and signs to identify hazards.
- Recordkeeping.

- Provide information and training to employees and students that cover the dangers of bloodborne pathogens and preventive practices.

4. BLOODBORNE PATHOGENS

Bloodborne pathogens are microscopic infectious materials in blood or certain other body fluids that can cause disease in humans. Healthcare workers whose occupational duties expose them to blood and other potentially infectious materials (OPIM) are at risk of contacting any of these bloodborne pathogens. Hepatitis B, and C and HIV are three of the most significant of these diseases. See Appendix A for a list of bloodborne pathogens.

4.1 ROUTES OF INFECTION:

Airborne

Transmission of aerosols occurs by dissemination of either airborne droplets or by dust particles containing the infectious agent. Infectious organisms transmitted in this manner can be dispersed by air currents which can then be inhaled. Therefore, special air handling and ventilation systems are required to prevent airborne transmission.

Ingestion

Infectious organisms can be ingested when they come into contact with the mouth via splashes or sprays to the face. Therefore, the OSHA requirement of no food or drink in a clinical area or laboratory is based on the premise of ingestion through food or drink contamination.

Direct Inoculation

Direct inoculation occurs from contact with an object that may be contaminated with an infectious organism such as a puncture with a contaminated needle which is the most common occurrence. Laboratory exposures have been reduced since glassware has been replaced with plastic substitutes.

Mucous Membrane Contact

Involves the contact of the conjunctiva or the mucous membrane of the nose with contaminated organisms through large droplets or splashes.

5. ROLES AND RESPONSIBILITIES

NSU shall ensure compliance with the OSHA regulations regarding bloodborne pathogens and the establishment of the Bloodborne Pathogens Exposure Control program.

The EHS office shall be responsible for the following:

- The implementation of the exposure control program.
- Maintain, review and update the program at least annually and whenever necessary to include new or modified tasks and procedures.

- Provide initial and annual training to all faculty, employees and students who are at risk of exposure.
- Ensure the departments provide and maintain all necessary PPE, and engineering control.
- Investigate exposure incidents.
- Maintain all documentation of training and medical incidents.

The employee and student health office shall:

- Provide medical surveillance to include administration of the Hepatitis B vaccine and medical follow-up for exposures.

The departments shall be responsible for:

- Identify individuals who are at risk of exposure.
- Ensure that employees and students complete the required training.
- Provide PPE and engineering controls to eliminate or reduce exposure.
- Maintain a current Bloodborne Pathogens Exposure Control policy.
- Ensure "Universal Precautions" are followed.

Employees, faculty and students shall:

- Complete the provided training and understand the risk associated with the job.
- Consider seriously the offer of hepatitis B vaccination.
- Follow the appropriate practices and procedures established for the work environment to limit or prevent exposures, and adopt the principle of "Universal Precautions".
- Report any exposures to supervisory personnel and undertake the necessary medical evaluation and treatment.

Contractors and vendors:

Outside contractors must make a copy of their blood-borne pathogens program and their exposure control plan available to the EHS office. Those who fail to follow the program requirements will be asked to leave the premises. Contractors with an insufficient program will not be allowed to begin work until their program meets or exceeds the requirements of this program. In areas where employees have been working with infectious materials, the area must be decontaminated before any construction or renovation can begin; this would apply to counter tops, cabinets and instrumentation surfaces.

Vendors who are required to work, fix or maintain instrumentation which may be contaminated are required to wear PPE. PPE shall be supplied by the department unless the vendor has their own special requirements for PPE.

6. EXPOSURE DETERMINATION

OSHA requires employers to perform an exposure determination concerning which employees and students may incur occupational exposure to blood and OPIM. The exposure determination

is made without regard to the use of personal protective equipment. All positions at NSU shall be listed and classified according to the employee's exposure level to bloodborne pathogens.

Category I

This category includes all employees and students whose routine duties involve direct contact with blood, body fluids, or tissues. The use of appropriate protective measures will be required for every employee and student engaged in Category I tasks. All faculty, employees and students in this group will be offered the Hepatitis vaccine within 10 days of initial assignment and must receive training prior to commencement of their duties.

Personnel who fall into this category are:

Job Classification	Job Exposure
Laboratory technicians	Patient Care OPIM
Phlebotomists	Patient Care OPIM
Nurses/Medical Assistants/Dental Assistants	Patient Care OPIM
Physicians	Patient Care OPIM
Research technicians	Biological agents

Category II

This category includes employees and students whose routine duties involve no exposure to blood or OPIM, but may require performing unplanned tasks in Category I. The normal work routine involves no contact with blood or OPIM, but contact may be required as a condition of employment. Appropriate protective measures shall be readily available for every employee engaged in Category II tasks.

Personnel who fall into this category are:

Job Classification	Job Exposure
Security personnel	Public interaction/first aid
Physical Plant	Maintenance restroom
Researchers	Potential biologicals
MOA Maintenance/custodial staff	Clean, maintain restrooms and emergency spills/cleanup. Public

Category III

These employees and students do not perform tasks that involve contact with blood or OPIM, and Category I tasks are not a job requirement. The normal work routine does not involve contact with blood or OPIM. Persons who perform these duties are not called upon as part of their job responsibilities, to perform any category I tasks or assist in emergency medical care or first aid.

Personnel who fall into this category are: Receptionists Administration staff

7. METHOD OF COMPLIANCE AND CONTROL

7.1 UNIVERSAL PRECAUTIONS:

Universal precautions as defined by the CDC are a set of precautions designed to protect employees from exposure to all human blood and body fluids. Under universal precautions, blood and body fluids from all patients are considered potentially infectious for bloodborne pathogens especially for HIV, HBV, and HCV.

POTENTIALLY INFECTIOUS MATERIALS (for bloodborne pathogens) are:

a. Human blood and blood products.
b. Semen and vaginal secretions.
c. Cerebrospinal fluid (CSF), synovial fluid, peritoneal fluid, pericardial fluid, amniotic fluid.
d. Saliva in dental procedures (assume blood contamination).
e. Any body fluid visibly contaminated with blood.
f. Any unfixed human tissue or organ.
g. HIV-containing cell, tissue, or organ cultures or solutions, and blood, organs, or other tissues from experimental animals infected with HIV or hepatitis B virus (HBV).

NOTE: Other body excretions such as saliva, urine, stool, vomitus and respiratory secretions are not included on this list (unless visibly contaminated with blood). However, many of these excretions present other infectious hazards.

UNIVERSAL PRECAUTIONS APPLY TO ALL BLOOD, BODY FLUIDS, TISSUES, AND SECRETIONS.

The following precautions apply to all health care professionals, employees and students who may have contact with human specimens and patients.

- Use appropriate barriers/PPE's to prevent skin and mucous membrane exposure when in contact with blood or bodily fluids.
- Use disposal gloves when working with blood and bodily fluids and when handling items or surfaces contaminated with blood and bodily fluids.
- Wash your hands before putting on gloves and immediately upon removing them.
- Use protective eye wear, or face shields during procedures that are likely to generate droplets of blood or other bodily fluids thus preventing exposures of the mucous membranes of the mouth, nose, and eyes.
- Use gowns or aprons during procedures that are likely to generate splashes of blood or other bodily fluids.
- Immediately and thoroughly wash hands and other skin surfaces with water and an antiseptic cleanser if contaminated with blood or other bodily fluids.
- Take the necessary precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during or after medical procedures, when cleaning instruments, and during disposal of used needles.
- To prevent needle-stick injuries, do not recap, bend, break, or remove needles or disposable syringes by hand.

- If an employee has exudative lesions or weeping dermatitis, they must wear gloves until the condition is resolved.

7.2 ENGINEERING CONTROLS:

Engineering and work safety practice controls are designed to minimize or eliminate occupational exposures of employees. Physical means to isolate the hazard, such as disposable sharps containers and self-sheathing needles, are called engineering controls. Altering the manner in which a task is performed, such as prohibiting recapping of needles, are considered work control practices. It is the employer's responsibility to ensure that the controls are examined and maintained on a regular basis for effectiveness.

Handwashing:

a. All personnel are required to wash their hands immediately or as soon as feasible after the removal of gloves or other personal protective equipment, even if there is no known exposure.
b. Following the exposure to blood or other potentially infectious materials, personnel shall wash their hands and any other exposed skin with soap and water, or flush mucous membranes with water immediately or as soon as feasible.
c. Eye wash stations are to be provided in all areas where the potential exists for the contamination of the eyes or face.
d. Handwashing facilities with soap and running water will be readily accessible to all personnel. If a handwashing facility is not feasible, an appropriate antiseptic hand cleanser and paper towels or antiseptic towelettes will be provided. After using antiseptic cleansing methods, hands should still be washed with soap and running water as soon as feasible.

Sharps - Disposal and Containers:

a. The following devices are considered sharps because they are likely to puncture a bag - needles, lancets, scalpel blades, sharp pipettes, slides, broken/contaminated glass, surgical staples, orthodontic wires, wooden applicator sticks or any other such item and must be disposed of in an approved sharps container. All staff is responsible for the proper disposal of sharps that they used.
Sharps are never to be discarded into the regular trash.
b. Bending, shearing, or breaking of used needles is strictly prohibited.
c. Contaminated sharps shall be discarded immediately or as soon as feasible.
d. Approved sharps containers are closable puncture-resistant hard plastic, leak-proof and labeled as biohazard. Sharps containers can be wall-mounted or free-standing, plastic sharps containers which are used in high-volume clinical areas and laboratories.
e. All sharp containers must be placed in convenient locations to the working areas where infected materials are being handled. Keep sharp containers at all times in the upright position and only fill about ¾ of the way.

f. The height of the wall mounted sharps containers plays a key role in allowing for the proper sharps disposal and the prevention of avoidable sharps injuries at the University. Many sharps injuries associated with wall mounted sharps containers frequently result from the inappropriate disposal of needles which bounce back during disposal. These types of incidents are more easily prevented if the opening of the sharps container is visible to the individual disposing of the sharp. Thus the height of the sharps containers must be such that the container's opening is visible to the vast majority of the users.

Sharps - Safety Devices:

a. Safety butterflies, syringes, lancets and straight needles must be employed whenever possible. Prior to purchasing, the safety committee or supervisor shall evaluate all safety devices for ease of use and protection afforded to the staff. The staff needs to understand the technology and activation system of safety devices; a passive system is preferred to a system that requires staff activation. All personnel are required to have training on the safety device prior to using the device. All used devices are disposed of in the sharps receptacle.
b. Needles are not to be used in the delivery of IV products. Needleless access devices are employed on all central lines and on intermittent injection sites. Entry into the IV system is either through an existing needleless port in the IV line or by applying a needleless access pin to the IV port. Efforts are underway to eliminate any emergency medication that may still contain a needle.
c. Engineering controls used to prevent sharps injuries will be reviewed and a trial recommended by the University's Safety Committee. Reviews are conducted as technology in sharps safety advances or as injury trends are identified.

Recapping Policy:

a. Needles are not to be recapped or disassembled from syringes before disposal.
b. A needle-syringe assembly is deposited as a unit directly into a sharps container. Needles attached to IV tubing should be cut off, and discarded directly into the sharps container. The remainder of the IV tubing should not be discarded into the sharps container.
c. Exception: If recapping must be performed for procedural or safety reasons, a specifically designed recapping device or the one-handed technique is to be employed for safe recapping of the needle. (For example, a needle must be removed from a blood gas syringe before sending the syringe to the laboratory, and the needle must be recapped before it can be safely removed.)

One-handed re-capping technique:

- Place the needle-cap on counter-top or table.
- Remove hand from the cap and away from the needle.
- Holding only the syringe, guide the needle into cap.
- Lift up the syringe so the cap is sitting on the needle hub.
- Secure the needle-cap into place.

Specimen Containers:

Specimen containers must be designed to prevent leakage during collection, handling, transportation, shipping and storage. Specimen containers require daily inspection for leakage. All blood tubes, glass or screw-top plastic specimen containers/vials, or culture bottles containing specimens should be handled in accordance with Universal Precautions. When a facility utilizes Universal Precautions in the handling of all specimens, the labeling/color-coding of specimens is not necessary provided containers are recognizable as containing specimens. This exemption only applies while such specimens/containers remain within the facility. Labeling or color-coding is required when such specimens/containers leave the facility.

Tighten the lids of the containers to prevent leakage and contamination on the outside of the containers, and if necessary decontaminate the specimen container before transporting or place the specimen in a sealed zip-lock bag or inside another leak-proof container. Gloves are to be worn when handling, transporting or processing all specimen containers.

All specimen containers must be clearly labeled and either labeled with a biohazard label or placed in a biohazard specimen bag. A readily observable label shall be attached to the equipment stating which portions remain contaminated. Medical waste containers for the disposal of contaminated gloves, etc. must be kept closed when not in use and clearly have the biohazard label displayed.

Biosafety Cabinets:

Certified biological safety cabinets (Class I, II, or III) or other appropriate combinations of personal protection or physical containment devices, such as special protective clothing, respirators, centrifuge safety cups, sealed centrifuge rotors, and containment caging for animals, shall be used for all activities with other potentially infectious materials that pose a threat of exposure to droplets, splashes, spills, or aerosols.

a. Biosafety cabinets provide staff, the environment, and product protection against potential hazards that may be present as an airborne particulate. This protection is achieved through HEPA (High Efficiency Particulate Air) filtration. Biosafety cabinets are used in laboratories to provide employees with protection from splashing, spraying, and inhalation of potentially infectious materials.
b. Certification of biosafety cabinets are required regardless of its usage and when one of the following occur:

    - Cabinet relocation
    - HEPA filter replacement
    - Repair or maintenance on any sealed portion of the cabinet

    All newly installed biosafety cabinets must be certified in place before initial use regardless of usage type. Biosafety cabinets shall also be certified whenever they are moved and at least annually.

Biosafety cabinets must be recertified annually if one or more of the following are used within the cabinet:

- Human products including but not limited to blood, body fluids, unfixed tissues
- Organisms requiring biosafety level 2 or higher containment
- Radioisotopes
- Carcinogens
- Recombinant DNA

Certification must be performed by an outside contractor. All individual certifiers must be accredited by a nationally recognized accreditation program such as but not limited to the National Sanitation Foundation. The biosafety cabinet certification procedure must comply with the National Sanitation Foundation's Standard Number 49: Class II (Laminar Flow) Biohazard Cabinetry.

c. Decontamination of the biosafety cabinets shall be performed by an outside contractor as noted above.

Decontamination must be performed:

- Before moving the cabinet to another location
- Before HEPA filter replacement
- Before repair or maintenance of any portion of the cabinet that may be contaminated

Food, Eating and Drinking:

In working areas such as procedure rooms, laboratories or dental labs where there is a reasonable potential of occupational exposure to blood or body fluids, eating, drinking, smoking, applying cosmetics, or handling contact lenses is prohibited. Hand cream is not considered a cosmetic. Hand creams with a base of petroleum or mineral oil may adversely affect glove integrity and should not be used, if such cream is used, then it must be washed off prior to placing on gloves.

Food and drink are prohibited to be stored in refrigerators, freezers, or cabinets which are, at any time, used for blood storage or other potentially infectious materials.

Laboratory Procedures:

All laboratory procedures involving blood or other potentially infectious materials shall be performed in a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.

Laboratory procedures with potentially infectious blood or body fluids which may generate splashing, spraying, or produce droplets are to be performed in a biosafety cabinet or behind a Plexiglas shield which protects the face of the laboratory personnel. Alternatively, a splash mask and goggles or face shield must be worn by the laboratory worker. Such procedures

include but are not limited to vigorous mixing, opening of vacutainer tubes or other stoppered / pressurized specimen containers.

When centrifuging potentially infectious body fluids, covers shall be used on the carriers/buckets. Do not open a centrifuge immediately after it has come to a full stop. Wait a few minutes then remove any specimens. If there is a breakage in the centrifuge, wait at least 5 minutes after the centrifuge has stopped and all the pieces have settled before opening the lid.

Mouth pipetting of blood or other potentially infectious materials is prohibited.

Patient Care Procedures:

All patient care procedures involving blood or other potentially infectious materials shall be handled in such a manner as to minimize splashing, spraying, spattering, or generation of droplets of these substances.

Some patient care activities that may result in splashing or spraying of body fluids include but not limited to are:

- Debriding wounds
- Changing soaked dressings
- Flushing ports of needleless IV system
- Cleaning teeth

Equipment decontamination:

Any equipment which may become contaminated with blood or other potentially infectious materials shall be examined prior to servicing or shipping and decontaminated as necessary, unless the employer can demonstrate that decontamination of such equipment or portions of such equipment is not feasible. The equipment shall be labeled with a biohazard symbol stating which portions remain contaminated.

This information shall be conveyed to all affected employees, servicing representatives prior to handling, servicing, or shipping so that appropriate precautions will be taken.

8. PERSONAL PROTECTIVE EQUIPMENT

Engineering and work practice controls shall be used to eliminate or minimize employee exposure. Where occupational exposure remains after institution of these controls, personal protective equipment shall also be used.

Multidisciplinary clinical, dental and research procedures conducted at NSU requires that personal protective equipment (protective clothing and safety apparatus/equipment) be used to protect the employees, students and researchers from contact with infectious, toxic and corrosive agents, excessive heat, cold, fire and other physical hazards. Suitable Personal Protective Equipment (PPE) also protects the patients or experiment from contamination. The

extent and kind of clothing and equipment to be selected for any particular activity depends upon the clinical and research operations and levels of risk associated with the procedure. While PPE is an important component of any safety plan, PPE is used with the understanding that PPE serves as a second line of defense.

Good patient techniques and procedures as well as good laboratory procedures with the appropriate laboratory equipment are the primary barriers against potential exposure to hazardous agents.

Clothing:

Commonly used PPE items within the clinical and laboratory areas are special clothing. Both reusable and disposable clothing is available. Whichever is used, it must be durable, designed to provide protection and prevent exposure of the skin to harmful agents, as well as be compatible with the methods of decontamination employed.

PPE clothing serves to protect the wearer, the experiment, and environment against contamination. If proper precautions are not taken, contaminated clothing may carry infectious materials outside the clinical and laboratory areas and into other work areas, cafeterias, or the home. Infectious agents can remain viable on cotton and wool fabrics and be disseminated from these fabrics.

Some additional points:

- Overt exposure to agents at all levels of risk should be followed by immediate decontamination of the PPE and change into clean PPE to protect the worker, the experiments and the environment.
- Provisions should be made for PPE to be provided to visitors, maintenance or security personnel, if applicable.
- PPE worn within the clinical and laboratory areas should not be worn outside the facility to any places accessible to the public.
- Personnel should be encouraged to use disposable facial tissues instead of personal handkerchiefs.
- PPE should be placed in an appropriately designated area or container for storage, washing, decontamination or disposal.
- All PPE should be decontaminated before being sent to the laundry or discarded. Treat contaminated areas of PPE with an appropriate disinfectant. Lab coats with extensive contamination may be placed in a biohazard bag and autoclaved.
- Do not take PPE home to launder; select a laundry service that follows universal precautions.
- Change PPE as soon as feasible whenever it is compromised, soiled or torn.
- Wear appropriate sizes and keep an adequate supply of PPE available in the clinical and laboratory areas.
- Wash hands whenever PPE is removed.
- Do not touch door handles, elevator buttons, telephones, computers or other clean surfaces or items with gloved hands.

- Wear closed-toe shoes and long pants to guard against skin contamination or chemical exposure. Do not wear sandals or shorts in the laboratory area.

Gloves:

Gloves should be comfortable and of sufficient length to prevent exposure of the wrist and forearm. Depending upon the intended use, the composition and design of the glove may vary to provide the desired level of flexibility, strength, impermeability, and resistance to penetration by sharp objects, as well as protection against heat and cold. Quality assurance is an important consideration. No one glove can be expected to be satisfactory for all intended uses.

New formulations of synthetic rubber and plastic continue to be developed as research makes varied and changing demands on the protective capabilities of gloves. Changing applications lead to improved capabilities of impermeability, strength, flexibility, tactile sense and control.

Disposable (single use) gloves provide a barrier between infectious agents and the skin. Disposable gloves shall not be washed or decontaminated for re-use. Glove use is a basic precept of preventing infectious agent transmission. Breaks in the skin barrier of the hand (damaged cuticles, scrapes, micro-cuts, dermatitis, etc.) are common.

Gloves shall be removed and hands washed before exiting any clinical or laboratory area. Use the one glove method, or an appropriate secondary container, when transporting materials through common use areas.

See Appendix B - Glove Selection Chart.

a. Considerations for the selection and use of gloves:

- Gloves are not 100% leakproof; change gloves periodically and when soiled and always wash hands after removing gloves or other PPE.
- Gloves will not prevent needle sticks or other puncture injuries.
- Check gloves for visible tears before use.
- Avoid wetting examination gloves as water or disinfectants will encourage wicking and leaking.
- Do not reuse examination gloves; discard contaminated gloves in a biohazard bag immediately after use.
- Double glove or use household utility gloves when cleaning spills. Household utility gloves may be decontaminated and reused (replace when compromised.)

b. Procedure for Removing Gloves:

- Grip the outside of one glove at the wrist with the other gloved hand, pull the glove off and gather it in the palm of gloved hand.
- Place the index or middle finger of the ungloved hand on the wrist of the gloved hand, slide a finger under the glove opening and pull the glove off inside out.
- When removing PPE, remove the lab coat or solid front gown first, then remove gloves

(aseptically), remove the face protection last to avoid touching your face with contaminated hands.

- If wearing double gloves, remove outer gloves before removing lab coat or solid front gown.

Shoes:

Shoes worn in the laboratory must be closed-toe. Protective shoes are required for certain work activities. When working with infectious agents it is advisable to wear shoe covers, which can be decontaminated (autoclaved) before disposal, over street shoes. For work in tissue culture laboratories it may be necessary to change from street shoes to specific laboratory shoes for protection of cultures from contamination.

In animal facilities, NSU requires personnel to wear overshoes to protect the animals in containment areas. Similarly, people who work with animals and do cage washing are required to wear protective shoes.

Gowns, Lab Coats, Coveralls, Aprons and Other Protective Clothing:

Gowns, lab coats and coveralls protect the wearer's clothing and skin from contamination. As with all PPE, the type of clothing needed depends on the task being performed and the degree of exposure anticipated. Solid front wrap-around clothing offers better protection than pull-over type clothing or clothing with front closures.

Lab coats are not 100% leakproof; change PPE when soiled, and always wash your hands after removing any PPE. Lab coats or other protective clothing will not prevent needle sticks or other punctures. Spills and splashes occur most often in the chest or lap area.

The contaminated surface must be touched during removal of a front closing jacket or lab coat. The contaminated portion often ends up in the wearer's face during removal of pullover clothing. Many workers prefer not to button up front closing jackets, which leaves street clothing exposed. If front closing jackets must be worn, strict measures shall be implemented to assure the clothing is closed at all times when performing procedures or tasks that may cause exposure.

Long sleeved garments with snug fitting cuffs are preferred over open or short sleeves. Snug fitting cuffs prevent splashes, splatters and aerosols from making contact with exposed skin on the lower arms. Longer single-use gloves can be pulled over snug fitting cuffs to seal out any infectious materials.

Plastic, vinyl or rubber aprons are usually worn over other protective clothing when extra protection is desired. Aprons are necessary for protection against liquids spilling or splashing on clothing. It is recommended that appropriate aprons be worn to protect against the potential harmful effects of liquid waste. Aprons may also be used to provide protection from steam and hot water in locations such as animal handling facilities, autoclave rooms and laboratory glass-washing rooms.

Face and Eye Protection:

Protection of the face and eyes is of prime importance in dental clinics and laboratories due to the potential for foreign material, both liquid and solid, to splash on the head, face and eyes or contact lenses. A variety of face shields, head covers/hoods, protective goggles, and lenses are available from safety supply houses. The selection is dependent upon materials of construction, fit, comfort, and compatibility with the work and the overall facial area requiring protection.

Some of the considerations for selection and use of face and eye protections are indicated below:

- Face shields and hoods protect the face and the neck from flying particles and sprays of hazardous material; however, they do not provide basic eye protection against impacting objects.
- Shields should cover the entire face, permit tilting back to clean the face if desired, and be easily removed in the event of an accident.
- If an eye hazard exists in a particular operation or experiment, the soundest safety policy would be to require that eye or face protection, or both, be worn at all times by all persons entering or working in the laboratory.
- Contact lenses do not provide eye protection. It is recommended that contact lenses not be worn when working around chemicals, fumes, and other hazardous material and dust particles since these items may become trapped in the space between the contact lens and the cornea. When contact lenses are worn, eye protection, such as tight fitting goggles, must be worn.

9. HOUSEKEEPING

The worksite shall be maintained in a clean and sanitary condition. All equipment and working surfaces in which the handling of blood or OPIM had occurred must be decontaminated upon:

1. Completion of a procedure;
2. Immediately or as soon as possible when surfaces are clearly contaminated or after any spill of blood or OPIM; and
3. The end of the workshift, if the surface could have been contaminated since the last cleaning.

Bins, cans and pails intended for reuse must be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated as soon as feasible upon visible contamination.

Broken glassware that may be contaminated must be picked up using mechanical means, such as a brush and dustpan, tongs, forceps, or other mechanical means. Protective coverings, such as plastic wrap, aluminum foil, or imperviously-backed absorbent paper used to cover equipment and environmental surfaces, shall be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the workshift if they may have become contaminated during the shift.

Decontamination of blood or OPIM must be conducted using an appropriate disinfectant that is effective against tuberculosis, HCV, HBV and HIV, such as a diluted 10% bleach solution. It is the responsibility of the individual causing the contamination to clean and disinfect the area.

Regulated Medical Waste:

Regulated medical waste is to be placed in containers which:

- Do not leak
- Are appropriately labeled or color-coded
- Are closed prior to removal to prevent contact spilling or protruding during handling.

Contaminated sharps:

Contaminated sharps are to be discarded immediately after use in containers that are:

- Closable
- Puncture-resistant;
- Leak-proof on sides and bottoms;
- Labeled or color-coded appropriately;
- Easily accessible to personnel;
- Located as close as feasible to the immediate area where sharps are used;
- Maintained upright throughout use; and
- Replaced routinely and not allowed to overfill.

Laundry:

Laundering of personal protective equipment is to be provided by the department at no cost to the employees or students.

Contaminated laundry shall be handled as little as possible with a minimum of agitation. Each department shall ensure that employees or students who are in contact with contaminated laundry wear the appropriate gloves and other appropriate personal protective equipment.

Contaminated laundry shall be bagged at the area of use and not sorted or rinsed. Contaminated laundry shall be placed and transported in containers labeled according to the hazards communication section unless the facility utilizes Universal Precautions in handling all soiled laundry. Then alternative labeling is sufficient if all employees recognize the containers as requiring compliance with Universal Precautions. If the laundry is wet it shall be placed and transported in leak proof bags.

If laundry is shipped offsite to a commercial facility which does not utilize Universal Precautions in its handling of all laundry, bags or containers with appropriate labeling and/or color-coding will be used to communicate the hazards associated with this material.

10. HAZARD COMMUNICATION

Signs and Labels:

Warning labels shall be affixed to the outside of containers holding regulated medical waste, refrigerators, and freezers containing blood and other potentially infectious materials; and secondary containers used to store or transport blood or other potentially infectious materials. Equipment that is used to analyze, process or contain blood or OPIM should be labeled with a biohazard label.

The labels must be affixed on the lid and all lateral sides of a secondary container so as to be visible from all angles. Labels shall have the international biohazard symbol. The labels shall be fluorescent orange or red with lettering or symbols in a contrasting color and contain the word "BIOHAZARD". The labels shall either be an integral part of the container or shall be tightly affixed to the container by adhesive to prevent their loss or removal. Red bags or red containers may be substituted for labels.

The EHS office is responsible for ensuring that warning labels are affixed or red bags are used as required if regulated medical waste or contaminated equipment is brought into the facility. Employees are to notify the EHS office, if they discover regulated medical waste containers, refrigerators containing blood or OPIM, contaminated equipment, etc., without proper labels.

Biohazard symbol

Signs must be posted at the entrances to work areas in which potentially infectious materials are being used and contain the following information:

- Universal biohazardous symbol.
- If necessary the name of the infectious agent.
- Special requirements for entering the area.
- Name and phone number of the responsible employee/supervisor for that area.

11. BIOLOGICAL SPILLS

Blood or OPIM spills in academic, administrative, laboratory or other general areas of NSU campuses will be cleaned up and disinfected according to the procedure described below. These operations are not viewed as emergency responses and will be conducted by general safety personnel who have received appropriate training. The procedure is designed to minimize the chances of employee exposure and shall be carefully followed.

Spill clean-up procedure:

1. Secure the area and call Campus Security, if necessary. If the spill situation appears a bigger problem than the available spill kit supplies or training can handle, have Security secure the area and notify the EHS office for assistance.

2. Put on gloves and if wet mop clean up is required wear safety goggles.

3. Disinfect the spill by using a quaternary ammonium disinfectant, a freshly prepared 1:10 dilution of bleach to water for small spills. Use disinfecting absorbent beads, such as "Vital 1" for large spills.

4. Areas with floor drains may be mopped and rinsed to sewer. Areas without floor drains may be wet mopped with detergent/water followed by wet mop rinsed with disinfectant water. Carpeted areas may be wet vacuumed with detergent/water followed by a disinfectant/water rinse.

5. If disinfecting absorbent beads are used, the solidified waste will be placed in a "biohazard red bag" marked with the standard biohazard symbol.

6. Any regulated medical waste associated with the spill such as a blood-soaked towel, will be placed in a "biohazard red bag" marked with the standard biohazard symbol.

7. After the clean-up, all surfaces will be treated with disinfectant such as a freshly prepared 1:10 dilution of bleach to water, or quaternary ammonium, and the surface area allowed to air dry.

8. Gloves worn during the clean-up process which are contaminated are to be placed in a "biohazard red bag" marked with the standard biohazard symbol.

9. Immediately after completing the cleanup, disinfecting the area, and the removal of gloves, the employee will thoroughly wash their hands and any exposed skin surfaces with a disinfectant soap.

10. EHS will be notified to remove any "biohazard red bag" waste generated by the spill in public areas.

11. The area will not be left unattended until cleaned-up, disinfected, and cleared of any "biohazard red bag" waste.

12. In clinic areas or laboratories, biological spills will be cleaned up immediately, and all biohazard waste stored in the appropriate storage areas until the scheduled pick-up.

12. REGULATED WASTE DISPOSAL

Infectious and regulated medical waste is defined as any waste material that is capable of producing disease in humans from pathogenic organisms. The EHS office and the Safety Officer are responsible for the management of infectious waste materials that are generated in the clinical and laboratories which includes the safe handling and disposing of this waste. Personnel are to be trained in the correct procedure for biohazard waste disposal and inexperienced or untrained personnel are not to manage the disposal of infectious waste. The disposal of biological waste is highly regulated and costly, thus it must be segregated properly from other types of waste.

The following are sources of infectious waste:

- Microbiological – discarded cultures of microorganisms.
- Human blood, blood products and certain body fluids as defined by OSHA.
- Pathological wastes – human tissue or anatomical wastes.
- Contaminated sharps- needles, blades, contaminated pipettes and microscope slides.
- Materials from an infectious spill.
- Dental disposable equipment and waste contaminated with human blood.
- Any waste contaminated by or mixed with infectious waste.

12.1 SEGREGATING BIOHAZARD WASTE

The proper manner for managing your biohazard waste is to correctly segregate the biohazard waste at the time of generation. It may be difficult or expensive to dispose of biohazard waste that is mixed, and the following guidelines may be used when segregating your waste.

- Do not combine biohazard waste with hazardous chemical or radioactive waste.
- Keep sharps separate from biological waste.
- If the different type of waste are mixed, try to treat the mixtures are follows:
- Decontaminate the biohazard component of the biohazard/radioactive waste and discard as radioactive waste.
- If safe to perform, decontaminate the biohazard component of the biohazard/hazardous chemical waste and discard as chemical waste.

12.2 HANDLING AND STORAGE

All infectious waste must be stored in the appropriate containers as soon as it is generated. These containers must be correctly labeled with the international “biohazard” symbol.

Biohazard symbol 

Biohazard Bags:

- Disposable red bags labeled with the biohazard symbol and the words "Biohazard Waste" are used for the disposal of solid biohazard waste.
- The bags must have the strength to pass the 165-gram dart impact test as prescribed by the Standard D 1709-85 of ASTM and certified by the manufacturer. This will prevent the bags from ripping, tearing or bursting under normal usage.
- The red bags should be contained in a secondary labeled container at all times to prevent infectious spills.
- When red bags are removed from the secondary container, they must be securely tied for storage.
- The secondary container must be rigid, leak-proof, puncture-resistant and have a tight fitting lid that is closed at all times except when adding waste to the container.
- Secondary containers that are reusable must be washed and decontaminated.

Sharp Containers:

- Used for the disposal of any devices that have rigid corners, edges and capable of cutting or piercing. Examples are blades, needles, microscope slides, syringes and pipettes.
- Sharp container must be rigid and puncture-resistant and labeled with the words "Sharps Waste" or the international biohazard symbol and "Biohazard".
- When sealed the sharp containers must be leak resistant and cannot be reopened. Sharp containers must be kept upright and placed close to the work area.
- Sharp containers are to be filled about ⅔ full, closed, sealed or taped and ready for pick-up.
- If leakage is possible, sharp containers should be placed in a secondary container prior to transport.

Storage:

- Biohazard waste storage areas must be secured.
- Biohazard waste can be disposed of in two ways – red bags can be autoclaved if this service is available and then disposed of as regular waste or transferred off the premises by a registered hauler for disposal.
- An alternative method for the disposing of infectious liquids can be down the sewer system but these liquids have to be disinfected with 10% bleach and this form of disposal has to be approved and comply with state regulations.
- Biohazard waste may not be stored for more than 7 days.

13. HEPATITIS B VACCINATION

Employees are offered participation in the Hepatitis B vaccination series that are at risk for occupational exposures. Hepatitis B vaccination series will be available to employees at no cost to them and at a reasonable time and place, and administered by a licensed healthcare professional. If the vaccine is refused by an employee, a declination form is signed and placed in the employee's health records; all employee health records remain confidential.

Hepatitis B Vaccine - is a safe and effective vaccine that has been available since 1982. The HBV provides over 95% protection against infection for nine years or more after vaccination of healthy individuals. The program recommends a series of three intramuscular doses of vaccine at 0, 1, and 6 months. This time span allows for the induction of an adequate antibody response in more than 90% of healthy individuals.

Alternatively, the vaccine can be given over a longer period of time (0, 1, 2, and, 12 months) to induce a stronger antibody response. The HBV vaccine is also 70-88% effective when given within 1 week of an HBV exposure (Appendix C – Hepatitis B vaccine declination).

HBV Antibody Testing shall be made available to an employee who desires such testing prior to deciding whether or not to receive HBV vaccination. If the employee is found to be immune to HBV by virtue of adequate antibody titer, then the employee can refuse the HBV vaccine.

14. POST-EXPOSURE EVALUATION AND FOLLOW-UP

The plan for post-exposure evaluation and follow-up will ensure that measures are taken to minimize the risk of infection secondary to the exposure. The circumstances surrounding the exposure are investigated and documented and that the employee receives medical consultation, follow-up, and treatment, if necessary, in a timely and expeditious fashion.

Any employee/student sustaining skin, mucous membrane, or percutaneous contact with blood or other potentially infectious materials shall cleanse the affected areas as soon as possible, as described below:

a. Intact skin - wash with soap and water.
b. Non-intact skin and needlesticks/scalpel cuts: wash with soap and water.
c. Intra-oral exposure - spit and rinse the mouth well with water.
d. Eyes - rinse well with sterile saline or with tap water. Employees and students working in laboratories shall rinse/flush their eyes at an eye wash station.

An employee/student who has had an exposure is required to:

a. Contact their supervisor,
b. Fill out an incident report form, and
c. Report to medical center for evaluation.
    - Employees report Family Medicine Clinic
    - Students report to Student Medical Center.
    - After hours, report to a local emergency room.

Post-exposure evaluation and follow-up will include the following:

a. Date, time, and location of the exposure
b. Route(s) or site of the exposure
c. The type of infectious material
d. The circumstances under which the exposure incident occurred to including the following:
   - The task being performed,
   - Type of accident,
   - Equipment malfunction,
   - Personal protective equipment in use, etc.
e. The source's identity, if known, unless not feasible or prohibited by state law.

If possible, the source individual's blood shall be tested for human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV). A written consent is required.

a. If the source individual is known to be positive for HIV, HBV or HCV, additional confirmatory tests may be appropriate.
b. If consent for testing cannot be obtained from the source individual, this will be documented in writing.

An exposed employee/student will be referred, as soon as possible, for medical evaluation and follow- up at the Family Medicine Clinic/Student Medical Center.

a. The follow-up process for the exposed employee/student includes antibody or antigen testing, counseling, illness reporting and safe and effective post-exposure prophylaxis which should be stated within two hours of the exposure and according to standard recommendations for medical practice.
b. The employer is required to provide the following information to the physician – a description of the affected employee's duties as they relate to the occupational exposure.
c. The health care provider will receive a copy of the OSHA standard 29 CFR 1910.1030.
d. The employer shall obtain and provide the employee with a copy of the physician's written opinion within 15 working days from the completion of the medical evaluation. In addition, results from the testing performed on the source specimen shall be made available to the employee as applicable with state and federal regulations (Appendix E – Post-exposure follow-up).
e. The written evaluation should state that the employee was informed of the results of the medical evaluation, and the employee in aware of any medical conditions resulting from occupational exposures which may require further evaluation or treatment.
f. Following the completion of a post-exposure follow-up, all exposure records will be maintained for the duration of employment/enrollment plus 30 years.
g. The exposure records shall include a copy of all results of any post-exposure evaluations, including medical examinations and follow-up procedures.
h. All records must be kept confidential and retained for the duration of employment plus 30 years.

15. TRAINING

All employees, faculty and students who handle blood or other potentially infectious materials shall be trained at the time of initial hire and annually thereafter. Additional training shall be provided upon any modification of tasks or procedures or the institution of new tasks or procedures which affect occupational exposure. General training and annual retraining is offered through the EHS Office.

The following topics should be covered in these courses:

- Explanation of the contents of 29 CFR 1910.1030.
- Epidemiology, symptoms, and the mode of transmission of bloodborne diseases.
- Exposure control plans.
- Tasks where exposure is possible.
- Uses and limitations of engineering controls.
- Selection and use of personal protective equipment, including removal, handling, decontamination and disposal.
- Hepatitis B Immunization Program.
- Emergency and post-exposure procedures.
- Warning signs and labels.
- Recordkeeping.

All compliance training must be maintained. As a requirement of 29 CFR 1910.1030, all training records shall be maintained for at least three years from the date of training. Job-specific training is the responsibility of the responsible individual/work supervisor.

16. RECORDKEEPING

Medical records:

Accurate health records shall be maintained on all employees/students. These records shall include:

- The name and social security number of the employee.
- A copy of the employee's hepatitis B vaccination record or declination form.
- A copy of all results of physical examinations, medical testing, and follow-up procedures following an exposure incident.
- Sharps Injury Log - all percutaneous injuries from contaminated sharps are recorded in the OSHA 300 Log. Records of all instances shall include the date of the injury, the type and brand of the device involved, the department or work area where the incident occurred and an explanation of how the incident occurred.
- The employer's copy of the physician's written opinion.
- A copy of the information provided to the physician.
- The employer shall assure that all employee medical records are kept confidential.
- The employer shall maintain this record for at least the duration of employment plus 30 years in accordance with 29 CFR 1910.20, Access to Employee Exposure and Medical

Records.
- All employee records shall be available to the Chief of the Division of Occupational Safety and Health (DOSH) and the National Institute for Occupational Safety and Health (NIOSH).

Training records:

Training records will be maintained by the EHS Office for three years from the date of training. The following information will be documented:

- The dates of the training sessions;
- An outline describing the material presented;
- The names and qualifications of persons conducting the training;
- The names and job titles of all persons attending the training sessions.

NSU provides training to all employees and students with possible risk of occupational exposure. A training program will also be provided for all new employees prior to/or at the time of initial assignment to tasks that may involve occupational exposure. Additional training will be provided as changes occur that will affect an employee's occupational exposure status, as well as annual training.

17. CONTRACTORS AND VENDORS

Outside contractors must make a copy of their blood-borne pathogens program and their exposure control plan available to the EHS office. Those who fail to follow the program requirements will be asked to leave the premises. Contractors with an insufficient program will not be allowed to begin work until their program meets or exceeds the requirements of this program. In areas where employees have been working with infectious materials, the area must be decontaminated before any construction or renovation can begin; this would apply to counter tops, cabinets and instrumentation surfaces.

Vendors who are required to work, fix or maintain instrumentation which may be contaminated are required to wear PPE. PPE shall be supplied by the department unless the vendor has their own special requirements for PPE.

18. DEFINITIONS

Blood - human blood, human blood components, and products made from human blood.

Bloodborne Pathogens - pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Clinical Laboratory - a workplace where diagnostic or other screening procedures are performed on blood or other potentially infectious materials.

Contaminated - the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Laundry - laundry which has been soiled with blood or other potentially infectious materials or may contain sharps.

Contaminated Sharps - any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

Decontamination - the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal.

Engineering Controls - controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogens hazard from the workplace.

Exposure Incident - a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties.

Handwashing Facilities - a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

HBV - hepatitis B virus.

HIV - human immunodeficiency virus.

Needleless systems - a device that does not use needles for: (1) The collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established; (2) The administration of medication or fluids; or (3) Any other procedure involving the potential for occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps.

Occupational Exposure - reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

Other Potentially Infectious Materials - (1) 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 body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-

containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Parenteral - piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.

Personal Protective Equipment is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Regulated Waste - liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

Research Laboratory - a laboratory producing or using research-laboratory-scale amounts of HIV or HBV. Research laboratories may produce high concentrations of HIV or HBV but not in the volume found in production facilities.

Sharps with engineered sharps injury protections - a nonneedle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident.

Source Individual - any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee. Examples include, but are not limited to, hospital and clinic patients; clients in institutions for the developmentally disabled; trauma victims; clients of drug and alcohol treatment facilities; residents of hospices and nursing homes; human remains; and individuals who donate or sell blood or blood components.

Universal Precautions - an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

Work Practice Controls - controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

APPENDIX A

List of Bloodborne Pathogens.[a, b, c]

Disease/Agent(s)	Common Names	Risk	Incubation	Sources
Serum Hepatitis/Hepatitis B Virus	Hepatitis B (42 nm), Hepadnavirus dsDNA	6-10% infection 1-2% fatal	11 weeks	Blood, semen, saliva, cerebral spinal fluid
Transfusion Hepatitis/Hepatitis C Virus	Hepatitis C, Non A, Non B (40-60 nm), Flaviviridae (ss RNA)	0.5-1% fatal	7 weeks	Blood, serum
AIDS: Retroviridae(100 nm) (Oncornavirus - RNA)	HIV-1, LAV (formally HTLV III)	< 0.5% infection, 100% fatal	Adults: 8 years Infants: 2 years	Blood, serum, saliva, tears, urine, breast milk, amniotic fluid, cerebral spinal fluid
	HIV-2 (West Africa) HTLV IV	<8.9% infection 100% fatal	Unknown	Blood, serum, saliva, tears, urine, breast milk, amniotic fluid, cerebral spinal fluid
Leukemia/Lymphomas Human T-Lymphotropic Virus (HTLV)	Retroviridae (Oncornavirus 100 nm), HTLV I	18-49% infection	Unknown	Blood
	HTLV II	52% Infection	Unknown	Blood
	HTLV V	Unknown	Unknown	Blood
Transmissible spongiform encephalopathies (CJD)	Creutzfeldt-Jakob Disease	30 cases per million	10-15 yrs.	Neurological and brain tissues, corneal spinal cord, transplant tissues
Kuru (50-300 µm)	Kuru Disease	Unknown	10-30 yrs.	Spinal cord, brain
Hemorrhagic fever: Marburg virus	Filovirus-ss RNA: (900 x 80 nm) MBG	22% fatal	4-16 days	Rodents, bodily fluids
Ebola virus	EBO	53-88% fatal		Rodents, bodily fluids
Argentine hemorrhagic fever	Junin virus (arenavirus: ss RNA-130 x 20 nm)	15% fatal	7-14 days	Rodents, bodily fluids, cerebral spinal fluid
Bolivian hemorrhagic fever	Machupo virus (ss RNA) Arenavirus 130 x 20 nm	18% fatal	7-14 days	Rodents, bodily fluids
Venereal syphilis/ Treponema pallidium	Bacterial spirochete (6 --15 x 0.1-0.2 µm)	14.6 per 100,000 cases	10-90 days	Bodily fluids
Zika Virus	Zika	20% infectious/ High risk of microencephaly in unborn child	3-12 days	Bodily fluids
Coronavirus	COVID-19	3,808 per 1M/950,000 deaths Globally	2-14 days	Body Fluids

[a] Hunt, D.L., "Human Immunodeficiency Virus Type 1 and Other Bloodborne Pathogens," *Laboratory Safety: Principles and Practices*, 2nd ed, Fleming, Richardson, Tulis, Vesley, Eds. (American Society of Microbiology, 1995) pp. 33-66.

[b] Jahrling, Peter, "Marburg Virus, Ebola Virus, and the Arenaviruses," *Manual of Clinical Microbiology*, 4th ed, Lennette, Balows, Hausler, and Shadomy , Eds.

(American Society of Microbiology, 1985) pp. 796-804.

[c] Swenson, P.D., "Hepatitis Viruses," *Manual of Clinical Microbiology*, 5th ed, Balows, Hausler, Herman, Isenberg and Shadomy, Eds. (American Society of Microbiology, 1991) pp. 959-983.

APPENDIX B

GLOVE SELECTION CHART

Gloves	Usage	Comments	Recommended for	Not recommended
Latex (Natural rubber) low cost	Incidental contact	Good for biological and water-based materials. Poor for organic solvents. Little chemical protection. Can puncture holes. Can cause or trigger latex allergies	Weak Acids, Weak bases, alcohols, aqueous solutions	Oils, greases and organics
Nitrile (synthetic rubber) low cost	Incidental contact	Good for solvents, oils, greases, and some acids and bases. Clear indication of tears and breaks. Good alternative for those with latex allergies	Oils, greases, acids, caustics, aliphatic solvents	Aromatic solvents, many ketones, esters, many chlorinated solvents
Butyl (synthetic rubber)	Extended contact	Good for ketones and esters. Poor for gasoline, aromatic, and halogenated hydrocarbons	Aldehydes, ketones, esters, glycol ethers, polar organic solvents	Aliphatic, aromatic and chlorinated solvents
Neoprene (synthetic rubber) medium cost	Extended contact	Good for acids, bases, alcohols, fuels, peroxides, hydrocarbons, and phenols.	Oxidizing acids, bases, alcohols, aniline, phenol, glycol ethers	Chlorinated solvents
PVA (poly-vinyl alcohol)	Specific use	Good for aromatic and chlorinated solvents. Poor for water-based solutions	A wide range of aliphatic, aromatic and chlorinated solvents, ketones	Acids, alcohols, bases, water
PVC (poly-vinyl chloride)	Specific use	Good for acids, bases, oils, fats, peroxides, and amines. Good resistance to abrasions. Poor for most organic solvents	Strong acids and bases, salts, other aqueous solutions, alcohols, glycol ethers	Aliphatic, aromatic and chlorinated solvents, aldehydes, ketones.
Viton (Fluoro-elastimer)	Extended use	Good for chlorinated and aromatic solvents. Good resistance to cuts and abrasions. Poor for ketones.	Aromatic, aliphatic and chlorinated solvents, and alcohols	Some ketones, esters, amines
Silver Shield(laminate)			Wide range of solvents, acids and bases	

APPENDIX C

NOVA SOUTHEASTERN UNIVERSITY
HEPATITIS B VIRUS (HBV) VACCINE ACCEPTANCE OR DECLINATION FORM

Acceptance Statement

I, the undersigned, acknowledge that my employer, Nova Southeastern University has offered the hepatitis B virus (HBV) vaccine to me at no cost. I have been informed of the biological hazards that exist in my workplace, and I understand the risks of exposure to blood or other potentially infectious materials involved with my job.
I wish to receive the hepatitis B virus vaccine.

Employee's name (printed)	Employee's signature	Badge Number
Department	Supervisor / Witness signature	Date

NOTE: If you accept to receive the hepatitis B vaccine, you must report to the designated medical provider within 10 working days of signing this form.

Declination Statement

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine at no charge to myself. However, **I decline hepatitis B vaccination at this time.** I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

All my questions regarding the risk of acquiring hepatitis B virus, and the hepatitis B virus vaccination process, have been answered to my satisfaction.

Employee's name (printed)	Employee's signature	Badge Number
Department	Supervisor / Witness signature	Date

Retain a copy of this document in Employee's medical record for 30 years after termination of employment

APPENDIX D

CONSENT FORM FOR TESTING

_____ My initials indicate that I have been given verbal and written educational information for HIV, HBV and HCV antibody testing.

Name _____ ID# _____

CONSENT FOR SEROLOGICAL TESTING FOR HIV, HBV and HCV ANTIBODIES
I have been informed that a sample of my blood will be drawn and tested to detect HIV, HBV and HCV antibodies. I have been informed of the purpose and potential uses of the test. By my signature below, I hereby acknowledge that I have read, or have had read to me, this information regarding HIV, HBV and HCV antibody testing. I have been given the opportunity to ask questions and any questions have been answered to my satisfaction. I acknowledge that I have given consent for performance of this blood test to detect HIV, HBV and HCV antibodies. I hereby release (laboratory name here) from any liability or claims arising from the reporting of the results of my test to authorized persons.

Signature of Patient/Responsible Party	Relationship if Not Patient
Witness	Second Witness (If Telephone Consent)
Date	Time

REFUSAL OF SEROLOGICAL TESTING FOR HIV, HBV and HCV ANTIBODIES
I have read the previous consent and have been adequately informed regarding HIV, HBV and HCV antibody testing. I have decided not to consent to testing. I hereby release (laboratory name here) from any liability or claims that I may have resulting from my refusal to HIV, HBV and HCV antibody testing. If a health care provider has a significant exposure to blood or body fluid from me or equipment used on me, and if I or my next-of-kin or legal guardian refuse to consent to HIV, HBV and HCV antibody testing, and a sample of my blood is available, the sample shall be tested for the presence of infectious diseases.

Signature of Patient/Responsible Party	Relationship if Not Patient
Witness	Second Witness (If Telephone Consent)
Date	Time

APPENDIX E

POST- EXPOSURE FOLLOW-UP

Laboratory name
Laboratory address

02/19/2002

Dear XXXX

Regarding your incident on (date), as we informed you, the source (patient) testing results are:

Hepatitis B surface antigen: Nonreactive
Hepatitis C antibody: Nonreactive
HIV (AIDS testing): Negative

Results of your blood tests drawn on are:

Hepatitis B surface antibody: Reactive- You are immune to Hepatitis B.
Hepatitis C antibody: Nonreactive
HIV 1/HIV 2 (AIDS testing): Nonreactive

You declined follow-up blood tests.

We recommend follow up blood testing for you on the following date (s).
6 weeks due:_____ 3 months due:_____ 6 months due:_____

You will be reminded when due.

Please contact (Employee Health or a physician) if any questions or any of the following symptoms occur: Low grade fever, Swollen glands, Unexplained rash or Weight loss, Malaise or Night sweats.

Contact XXXX at XXX-XXXX, or pager XXX-XXXX, for additional help.

This information is being provided to you as a result of a confidential medical evaluation and follow-up for a reported blood borne pathogen exposure.

The source results are made available to you according to federal regulation. Under applicable laws and regulations, you may not further disclose their identity and infectious status.

Confidential Report
Consistent with Federal Register, Bloodborne Pathogens- (29 CFR 1910.1030).

Healthcare Professional Signature: _____Date: _____

APPENDIX F

INFORMATION ON THE HEPATITIS B VACCINE

The Disease

Hepatitis means inflammation of the liver. Hepatitis B, which is a viral infection, is one of multiple causes of hepatitis. Most people with Hepatitis B recover completely, but approximately 5-50% become chronic carriers; 1-2% die of fulminant hepatitis. In the group of chronic carriers, many have no symptoms and appear well, yet can transmit the virus to others. Others may develop a variety of symptoms and liver problems varying from mild to severe (chronic persistent hepatitis, chronic active hepatitis, cirrhosis and liver failure). There is also an association between Hepatitis B virus and hepatoma (a form of liver cancer).

Hepatitis B virus can be transmitted by contact with body fluids including blood (including contaminated needles), semen, tears, saliva, urine, breast milk, and vaginal secretions. Health workers are at high risk of acquiring Hepatitis B because of frequent contact with blood or potentially contaminated body fluids and, therefore, vaccine is recommended to prevent the illness.

The Vaccine

Hepatitis B vaccine is made two ways. Plasma-derived vaccine is made from portions of HBV particles that have been purified from the blood of carriers. The method used to prepare the plasma-derived hepatitis vaccine kills all types of viruses found in human blood, including the virus that causes Acquired Immunodeficiency Syndrome (AIDS). The recombinant vaccine is made from common baker's yeast cells through genetic engineering. The yeast-derived vaccine does not contain human blood products. The vaccine is given by injection on three separate dates. The first two doses should be given 1 month apart, and the third dose, 5 months after the second. After three doses, the hepatitis B vaccine is 85% - 95% effective in preventing hepatitis B infection in those who received the vaccine. The protection for normal adults and children given vaccine properly lasts at least 5 years. Booster doses of vaccine are not routinely recommended at this time.

Possible side effects

The most common side effect is soreness at the site of injection. Other illnesses, such as neurologic reactions, have been reported after vaccine is given but hepatitis B vaccine is not believed to be the cause of these illnesses. As with any drug or vaccine, there is a rare possibility that allergic or more serious reactions or even death could occur. No deaths, however, have been reported in persons who have received this vaccine. Giving hepatitis B vaccine to persons who are already immune or to carriers will not increase the risk of side effects.

Contraindications

Hypersensitivity to yeast or any other component of the vaccine (e.g.: formalin or mercury derivatives) is a contraindication for use of the vaccine.

Warnings

Hepatitis B has a long incubation period. Hepatitis B Vaccination may not prevent Hepatitis B infection in individuals who have an unrecognized Hepatitis B infection at the time of vaccine administration. Additionally, small percentages of healthy people do not respond to the vaccine and do not develop an immunity to the HBV.

Pregnancy

No information is available about the safety of the vaccine for unborn babies; however, because the vaccine contains only particles that do not cause hepatitis B infection, there should be no risk. In contrast, if a pregnant woman gets a hepatitis B infection, this may cause severe disease in the mother and chronic infection in the newborn baby. Therefore, pregnant women who are otherwise eligible can be given hepatitis B vaccine.