BLOODBORNE PATHOGEN EXPOSURE CONTROL PROGRAM

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Foreword

The outline for reducing the risk of workplace exposures to Bloodborne Pathogens is contained within the Occupational Safety and Health Administration’s (OSHA) regulations set forth in 29 CFR 1910.1030. The purpose of this standard is to protect workers by preventing exposures to Bloodborne Pathogens through the utilization of work practice controls, personal protective equipment and training. The purpose of Rensselaer’s Bloodborne Pathogen Exposure Control Plan is to provide a reference and procedural document for employees of Rensselaer. The Bloodborne Pathogen standard is designed to apply to all individuals that are covered by the occupational exposure definition (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), but the information is useful to all faculty, staff and students of Rensselaer.

Section 1. Bloodborne Pathogen Recognition

1.1 Introduction

Bloodborne Pathogens, in general terms, are microorganisms present in human blood, and certain other bodily fluids and tissues, which can cause disease in humans. OSHA has not attempted to identify all occupations where exposures could occur; therefore employees covered by the standard are those who face a “reasonably anticipated” exposure to human blood or Other Potentially Infectious Materials (OPIM) due to the nature of their job assignments. Statistically, Hepatitis-B (HBV) is the most prevalent infectious bloodborne hazard faced on the job, since it can be contracted through indirect contact with blood or other potentially infectious materials. Indirect contact can include contact with surfaces where dried blood or other bodily fluids are present. Other potential bloodborne pathogens include Hepatitis-C (HVC) and Human Immunodeficiency virus(HIV), which is the virus associated with AIDS. While less common, these diseases are serious health threats that can lead to chronic illnesses and death. Your risk of infection, relating to bloodborne pathogens in general, is dependent upon the amount of virus present, the route of exposure, the mode of transmission, the host immunity, and the protective measures employed. Following the procedures set forth is this manual will help to prevent exposure.
1.2 Definitions

The following list of definitions is not intended to be exhaustive; however the understanding of the terms as presented below is a critical element of the effectiveness of Rensselaer’s BBP training program.

**Bloodborne Pathogen**: a microorganism present in blood, certain body fluids, & body tissue that can cause disease. Diseases include, but are not limited to: Hepatitis B (HBV), Syphilis, Malaria, and HIV (Human Immunodeficiency Virus).

**Body Fluids**: body fluids such as blood, saliva, amniotic fluid and any other fluid visibly contaminated with blood.

**Contaminated**: means the presence or the reasonably anticipated presence of blood or other potentially infectious materials. Contaminated surfaces are a major mode of HBV spread. HBV can remain viable on environmental surfaces dried for at least one week.

**Exposure Incident**: means a specific eye, mouth, or other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of job duties.

**(HBV) Hepatitis**: Means “inflammation of the liver”. Hepatitis B virus is the major infectious Bloodborne hazard faced on the job. This virus may cause fever, malaise, anorexia, nausea, jaundice, arthritis and other symptoms. You may feel no symptoms at all, as if you were not infected at all. Your blood, saliva and other body fluids may be infectious and you have the potential to spread the disease to others. HBV may damage your liver, leading to cirrhosis and potentially death.

**(HIV) Human Immunodeficiency Virus**: Is the universally accepted term for the virus, which is associated with AIDS. HIV is transmitted primarily through sexual contact, but may also be transmitted through contact with blood and some body fluids.

**Occupational Exposure**: means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of job duties.

**Universal Precautions**: is an approach to infection control, **all** human blood and certain body fluids are treated as if known to be infectious for HIV, HBV, and other Bloodborne pathogens. Universal precautions may include the use of engineering controls, personal protective equipment, and work practice controls to prevent the spread of infectious disease.
**Work Practice Controls:** The controls implemented to reduce the likelihood of exposure by altering the manner in which a task is performed.

**Methods of Infection**

*Direct inoculation.* blood or infectious material contamination of the eyes, mouth or nose. Contacts with open cuts, nicks and skin abrasions as well as contact with rashes or acne. Parenteral, infection refers to piercing of the skin or mucous membranes by contaminated objects.

*Indirect Transmission:* May occur from touching a contaminated object or surface and transferring the infectious material to your mouth, eyes, nose or open skin.

*Contaminated surfaces:* Contaminated environmental surfaces can be a source for HBV. HBV can survive on environmental surfaces dried at room temperature for at least one week. OSHA estimates that one-milliliter of HBV positive blood may contain 100 million infectious doses of virus. Therefore, it does not take much of an exposure to permit infection. A can of soda contains 355 milliliters of soda! Luckily, the HIV virus is not as resilient as HBV. It does not live outside the body for very long and is not transmitted by casual contact, mosquitoes, or other animals.

You CANNOT visually determine if an environmental surface is contaminated or if an individual is a carrier of Bloodborne pathogens. Many people show no symptoms of infection and others may be infected and not know it. Both HIV and HBV infect people of all ages, socioeconomic classes, from every state and territory, and from rural areas as well as cities. While the risk associated with Bloodborne pathogens is quite serious, there are many precautions that can be taken to prevent transmission of these infectious viruses.

*Personal protective equipment:* The use of gloves and other barrier devices will help to prevent contact with blood. Other barrier devices may include splash goggles for personnel who may have to clean environmental surfaces, which had contact with potentially infectious materials. *Personal protective equipment is considered “appropriate” only if it does not permit blood or other potentially infectious materials to pass through the equipment to or reach you or your clothes in normal use. Personal protective equipment shall be removed prior to leaving the area that required the use of the personal protective equipment.*
Employee work practices: Hand washing keeps you from transferring contamination from your hands to other areas of your body or other surfaces you may contact later. Every time you take off a pair of gloves, you should wash your hands. If your skin or mucous membranes come into contact with blood, or any other potentially infectious materials, wash or flush with water as soon as possible. The sooner you wash your hands, the less chance you have of being infected. Do not eat, drink, smoke, apply cosmetics or lip balms or handle contact lenses where you may be exposed to blood or other potentially infectious materials.

Sharps with Engineered Sharps Injury Protectors: 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.

Needleless Systems: a device that does not use needles for: a) The collection of body fluids or withdrawal of body fluids after initial venous or arterial access is established, b) the administration of medication or fluids, or c) any other procedure involving the potential for occupational exposure to Bloodborne Pathogens due to puncture injuries from contaminated sharps.

1.3 Human Immunodeficiency Syndrome (HIV)

HIV is the virus that causes AIDS (Acquired Immunodeficiency Syndrome). A positive test for HIV does not mean that a person has AIDS. AIDS is generally associated with an individual developing a so called “indicator illness”. HIV can weaken the immune system to the point that a person may have difficulty fighting off infections that are usually controlled by a healthy immune system. HIV transmission can occur when blood, semen, vaginal fluid, or breast milk from an infected person enters the body of an uninfected person. The contact must include a mucous membrane, such as the eyes, nose, cuts or sores on the skin or a puncture wound. Intact, healthy skin is an excellent barrier against HIV, viruses and bacteria. HIV is not transmitted by day-to-day contact in workplaces, schools or social settings. HIV is not an airborne or food-borne virus. The greatest opportunities in which HIV could potentially be transmitted in the workplace at Rensselaer include:

1) Medical Emergencies resulting in blood contact through a worker’s open cut
2) Accidental injuries from needles and other sharp instruments that may be contaminated with the virus
3) Splashes of infected materials into the workers eyes or inside their noses.
The only way to determine conclusively that HIV transmission has occurred is through HIV blood testing. You cannot rely on symptoms to show transmission. The following may be warning signs of HIV infection:

- Rapid weight loss
- Dry cough
- Recurring fever, night sweats, fatigue
- Diarrhea that lasts for more than a week
- White spots or unusual blemishes on the tongue, in the mouth or throat
- Red, brown, pink or purplish blotches on or under the skin, inside the mouth
- Memory loss, depression and other neurological disorders

### 1.4 Hepatitis-B (HBV)

Hepatitis-B is a disease caused by the Hepatitis-B virus (HBV). As with HIV, HBV is present in the blood and bodily fluids of infected individuals. HBV is thought to be roughly 100 times more infectious than HIV.

Symptoms usually appear within 2 to 6 weeks after contact. They can include:

- poor appetite; nausea; vomiting;
- headaches, general malaise; jaundice (yellowing of eyes and skin);
- dark tea-colored urine; and light-colored stools.

Even without symptoms, you can pass the virus to others. Chronic carriers carry the hepatitis B virus for the rest of their lives and unknowingly pass it to others. Like all bloodborne pathogens, the hepatitis-B virus is spread through contact with infected blood or body fluids. If your work at Rensselaer includes “occupational exposure” (reasonably anticipated exposure to blood or other potentially infectious materials) you will be offered the vaccination series at no charge.

The greatest opportunities in which HBV could potentially be transmitted in the workplace at Rensselaer include:

1. Medical Emergencies resulting in blood contact through a worker’s open cut
2. Accidental injuries from needles and other sharp instruments that may be contaminated with the virus
3. Splashes of infected materials into the workers eyes or inside their noses.
4. Through the cleaning up of bodily fluids
1.5 Hepatitis-C (HCV)

The Hepatitis-C virus is the most common chronic bloodborne virus in the United States today, and is a major cause of liver disease. HCV is present in the blood and bodily fluids of infected individuals. Unlike HBV, there is currently no preventative vaccine available for HCV. The greatest opportunities in which HCV could potentially be transmitted in the workplace at Rensselaer include:

1) Medical Emergencies resulting in blood contact through a worker’s open cut
2) Accidental injuries from needles and other sharp instruments that may be contaminated with the virus
3) Splashes of infected materials into the workers eyes or inside their noses

Like HIV, the incidence of contracting HCV from workplace exposures is relatively rare, since HCV is not transmitted through incidental contacts.

1.6 Other Potentially Infectious Materials (OPIM)

- Other Potentially Infectious Materials (OPIM) includes the following list of potential Bloodborne pathogen transmission sources: semen, vaginal secretions, cerebrospinal (brain) fluid, synovial (joint) fluid, pleural (lungs) fluid, pericardial (heart) fluid, peritoneal (abdominal) 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.

- Any unfixed tissue or organ (other than intact skin) from a human (living or dead)

- HIV – containing cell or tissue cultures, organ cultures, and HIV – or HBV – or HCV containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV or HCV.
Section 2. Exposure Control

2.1 Universal Precautions

The foundation of Rensselaer’s Bloodborne Pathogen Exposure Control Plan is the concept of Universal Precautions, which simply states that all human blood and/or bodily fluids, including Other Potentially Infectious Materials are to be treated as if they are known to be infectious for HIV, HBV, HCV and/or other Bloodborne pathogens. Universal precautions include the use of work practice controls and personal protective equipment to prevent the spread of infectious disease. It is essential that the concept of Universal Precautions be implemented in all decontamination and emergency situations involving bodily fluids.

2.2 Personal Hygiene

The four “routes of entry” into the body should be considered when evaluating BBP exposure. These routes of entry include:

- Absorption
- Inhalation
- Injection
- Ingestion

To reduce the chance of ingestion and absorption through mucous membranes, hands and other skin should be washed thoroughly with soap and water immediately after a medical, decontamination or emergency procedure involving the potential for bloodborne pathogen exposure. In situations where hand-washing facilities are not readily available, appropriate antiseptic hand cleaner must be used. Antiseptic towelettes may be used as an interim cleaning method, however hands and other skin areas should be washed with soap and water as soon as possible.

Also, eating drinking, smoking, applying cosmetics or lip balm and handling contact lenses is prohibited in areas where there is a reasonable likelihood of “occupational exposure”.

2.3 Work Practice Controls

Work Practice Controls should always be considered in conjunction with Personal Protective equipment. Any time that specific hazards can be designed out of a procedure, the opportunity for injury and/or illness is reduced.

- Broken glassware, sharps and/or needles and syringes should never be picked up by hand. These materials should always be handled with tongs, sweeping devices, dustpans etc. Materials that present a parenteral or injection hazard should be placed in puncture proof containers, as shown below, and properly labeled. These materials should never be thrown away in the regular trash.

- All procedures involving blood or Other Potentially Infectious Materials should be performed in a manor such that splashing, spraying, spattering or the generation of droplets is minimized. Using pressure washing equipment or the like is prohibited.

- Mouth pipetting/suctioning of blood or Other Potentially Infectious Materials (OPIM) is prohibited

- Containers used to store and/or transport clean-up materials must be leak proof and properly labeled.

- Needles should never be bent or recapped.

- Needles should never be “sheared” or broken off.

- No food or drink should be present in refrigerators, freezers, shelves, cabinets, benches, or countertops where blood or other potentially infectious materials are present.

- Whenever the medical procedure or experimental design permits, sharps with engineered sharps injury protections, or needleless systems will be utilized at Rensselaer.
2.4 Personal Protective Equipment

As with other hazard assessment and reduction efforts, Personal Protective Equipment should be used in addition to, not in place of, work practice controls. When considering Bloodborne Pathogen related PPE, the goal must be to prevent blood or Other Potentially Infectious Materials from contacting the body or mucous membranes. All disposable clothing such as gloves, boots, aprons etc. shall be discarded in appropriate Biohazard containers. Reusable items such as face shields and tongs will be decontaminated and the rinse material collected.

**Gloves**

- **Latex gloves** provide an excellent barrier to virus and bacteria. Latex gloves should be worn whenever activities involving occupational exposure are being completed. Inflation tests should always be completed prior to glove utilization to insure integrity. Latex gloves should always be removed from the “inside out”.

- **Nitrile gloves** offer an adequate substitute for Latex, if a sensitivity to Latex exists.

- **Puncture Resistant Gloves** should be worn whenever the probability for sharps or abrasion is present. These gloves should not be considered a substitute for work practice controls such as tongs and clean-up pans. In situations that require puncture resistant gloves, latex, or nitrile gloves should be worn underneath.

- **Shoe covers**, either disposal or reusable, must be worn in clean-up situations that present splash hazards. The shoe covers are intended to prevent shoe contamination and the contamination of clean surfaces such as automobiles and other workspaces.

- **Face shields** must be worn whenever a splash hazard is a potential during any activities involving occupational exposure. As a standard procedure for secondary protection safety glasses should be worn under face shields.
- **Aprons or Clean-up suits** should be worn during clean up activities to prevent the contamination of clothing.

- **Respirators** should be utilized in cases where liquids may potentially become aerosolized. High efficiency particulate air (HEPA) filters should be used as aerosol particulate containing blood has been measured to .52 microns. Full Face style respirators also afford excellent splash protection to the eyes nose and mouth. For more information regarding respirators consult Rensselaer’s *Respiratory Protection Program.*
Section 3. Decontamination

3.1 Surfaces

All surfaces that have been contaminated with blood or Other Potentially Infectious Materials must be decontaminated as soon as possible following a Bloodborne Pathogen related incident. Keep in mind that you will not be able to detect infectious materials, or possible blood contained in other bodily fluids. Universal Precautions are to be implemented at all times. Also remember that PPE is designed to provide secondary protection. Work Practice controls should be utilized whenever possible. Standard decontamination solution is comprised of 1 and ½ cups of household bleach (Sodium Hypochlorite) to 1 gallon of water, or 1 part bleach to 10 parts water.

\[ \frac{5.25 \text{ (Concentration)}}{10\% \text{ Sodium Hypochlorite}} + \frac{\text{Water}}{\text{Solution}} = \frac{1 \text{ part bleach}}{10 \text{ parts water}} \]

Hypochlorite is quickly inactivated by the presence of organic matter, of which over 6 million compounds have been identified and named. In order to maximize the effectiveness of such solutions, the decontamination solution should be prepared daily. Containers used to store the decontamination solution should be labeled as to their contents and dated to avoid the use of ineffective solutions.

Specific decontamination procedures are dependent upon the degree of contamination and the substance that is contaminated. Surface cleaning will effectively clean relatively impervious surfaces, such as lab benches or porcelain, but will not completely decontaminate porous substances such as rug or cloth since only the outside layer of the material to be disinfected will be bound with the chlorine molecules in the bleach solution. In such cases, materials must be soaked or disposed of as Regulated Medical Wastes.
3.2 Equipment

Equipment decontamination presents unique challenges in that the size and complexity of such equipment may make decontamination difficult, if not impossible, without disassembly. As with surface decontamination, solutions of bleach must be in a 1:10 ratio with water and have been formulated that day. Procedures should be designed in such a way as to reduce splatter potential and employee exposure. Also, when working on equipment proper Lockout/Tag out procedures must be followed and Electrical safety concepts adhered to. For more information on energy isolation, refer to Rensselaer’s Lockout/Tag out Program.

3.3 Laundry/Apparel

Decontamination procedures should not be attempted on contaminated laundry/apparel. These items should never be taken off campus, unless by a licensed waste hauling company. All contaminated clothing, and/or body covering PPE articles should be containerized and labeled as discussed in Section 4, destined for disposal at appropriate facilities.
3.4 Decontamination Procedures

Although there are many unique scenarios which can be considered involving the decontamination of bloodborne pathogen contaminated items, some general guidelines apply to all situations. In the event of a potential bloodborne pathogen spill the following procedures should be followed:

1) Isolate the area, preventing access to unauthorized individuals
2) Set up a decontamination area for your PPE/supplies
3) Make sure that you have the proper equipment, such as brushes, dustpans etc. to minimize the chance of an exposure.
4) Put on Personal Protective Equipment appropriate for the task you will be performing. At a minimum this should include gloves, latex or nitrile, a face shield with safety glasses underneath, and shoe covers.
5) Isolate the potential bloodborne pathogen fluids by surrounding the area with absorbent materials such as universal sorbent socks, pads or other sorbents designed to absorb water phase materials.
6) Place all clean up materials in a leak-proof container/biohazard red bag. There should be no free liquids in the container. Use additional sorbents to absorb liquids if necessary.
7) Decontaminate the affected surfaces with hypochlorite solution as defined in section 3.1. Add sorbent materials used in this process to the container/biohazard red bag making sure that no free liquids are present.
8) Remove all Personal protective equipment in the following order and place it in a leak-proof/biohazard red bag:
   - Decontaminate re-usable PPE such as Face shields etc
   - Aprons or disposable outerwear
   - Shoe covers
   - Gloves; remove from the “inside out”
9) A new pair of latex or nitrile gloves should be put on.
10) Seal the container/biohazard red bag and then place that container bag inside a second biohazard red bag. A biohazard label should be placed on the container. If contamination of the outside of the second biohazard red bag occurs at any point, the container shall be placed inside a third biohazard red bag. A biohazard label should always be placed, at a minimum, on the outermost container.
11) Hands and other skin surfaces should be washed thoroughly with soap and water.
Section 4. Regulated Medical Waste

4.1 Determination

In New York State, the term Regulated Medical Waste is defined as:

- *Cultures and stocks of infectious agents*
- *Human pathological wastes*
- *Liquid waste human blood, or contaminated items*
- *Sharps associated with human or animal treatment, including broken glassware*
- *Contaminated animal carcasses*
- *Laboratory wastes from medical, pathological and other research*
- *Wastes from surgery or autopsy*
- *Dialysis water that was in contact with blood or Other Potentially Infectious Materials*
- *Biological wastes contaminated with blood or Other Potentially Infectious Materials*

If there are any questions regarding the applicability of the included definition to a specific material, please contact the Office of Environmental Health and Safety @ x2281, x2318, or x2092.

4.2 Containerization

All Regulated Medical Wastes must be placed in a container, which is closable and is constructed to prevent leaks. No free liquids should be present in biohazard containers. The container should remain closed as all times, other than when material is being added. Containers are generally red in color, and specific container types are required at Rensselaer for waste types of routine nature.
These waste types and container requirements include:

- **Waste Category**  
  *Contaminated sharps*  
  **Examples**  
  Contaminated needles, scalpels, syringes, and broken glass

  Container: Must be puncture resistant and leak proof.

- **Waste Category**  
  *Human blood, blood products*  
  **Examples**  
  Blood, serum, plasma and blood products  
  Disposable items contaminated by blood or body fluid: dressings, sponges, surgical gloves, etc.

  Container: Must be able to close and prevent leakage

**Liquids/Specimens (Diagnostic)**

**Solids/Debris**
- **Waste Category**
  
  *Cultures, stocks of infectious agents*

  **Examples**
  
  Discarded live and attenuated vaccines

Container: Must meet applicable DOT/IATA Requirements

Regulated Medical waste packaging/containerization materials are available through the Office of Environmental Health and Safety - Blaw Knox II.
Section 5. Hazard Communication and Training

5.1 Labeling

Warning labels must be affixed to containers of regulated waste, refrigerators and freezers containing blood or Other Potentially Infectious Materials and any other containers used to store, transport or ship blood, contaminated debris/equipment or other potentially infectious materials. The labels shall consist of the following:

Containers being prepared for shipment that contain known Infectious Materials, as defined in the Department of Health and Human Services regulations, part 42 CFR 72.3, must conform with applicable DOT/IATA packaging requirements and contain the following label. Commercial Carriers may require further shipping requirements and/or protocols.

5.2 Warning Signs

Signs must be posted at the entrances of HIV and HBV Research Laboratories and Production facilities. These signs must contain the Biohazard label, along with the name of any and all Infectious agents present, special requirements for entering the area, and the name and telephone number of the laboratory director or other responsible person.
5.3 HIV and HBV Research Laboratories and Production Facilities

Research laboratories and production facilities engaged in the culture, production, concentration, experimentation, and manipulation of HIV, HBV and HCV must adhere to the following requirements. (See key on the following page)
HIV and HBV Research Laboratories and Production Facilities Key

1. Laboratory doors must be kept closed when work involving HIV or HBV is in progress. Access doors to the work area or containment module must be self-closing.

2. Contaminated materials, including all materials subject to Rensselaer’s policy of Universal Precautions must be placed in a durable, leak proof, labeled and/or color coded container that is kept closed at all times (other than when material is being added) for disposal.

3. Access to the work area will be limited to authorized persons. Control measures must be in place to insure that only individuals who have been advised of the potential hazards, who meet any specific entry requirements, and who comply with all entry and exit procedures are allowed into the work area. When potentially infectious materials or infected animals are present in the work area or containment module, a hazard sign incorporating the universal biohazard symbol must be posted on all access doors.

4. The work areas must be separated from areas that are open to unrestricted traffic flow within the building. Passage through two sets of doors shall be the basic requirement for entry into the work area from access corridors or other contiguous areas.

5. Each work area must contain a sink for washing hands and a readily available eyewash. The sink must be foot, elbow, or automatically operated and shall be located near the exit door of the work area.

6. All activities involving other potentially infectious materials must be conducted in biological safety cabinets or other physical-containment devices. No work with these other potentially infectious materials shall be conducted on the open bench. Biological safety cabinets must be certified when installed, whenever they are moved, and at least annually. Certified biological safety cabinets (class I,II or III) or other appropriate combinations of personal protection or physical containment devices, such as protective clothing, respirators, centrifuge safety cups, sealed centrifuge rotors, and containment caging for animals, must be used for all activities with potentially infectious materials that pose a threat of exposure to droplets, splashes, spills or aerosols.

7. Laboratory coats, gowns, smocks, uniforms or other appropriate protective clothing must be worn in the work area and animal rooms. Protective clothing must not be worn outside of the work area and must be decontaminated before being laundered. Special care must be taken to avoid skin contact with potentially infectious materials. Gloves shall be worn when handling infected animals and when making hand contact with potentially infectious materials in unavoidable.

8. The surfaces of doors, walls and floors in the work area must be water resistant so that they can be easily cleaned. Penetrations in these surfaces shall be sealed or capable of being sealed to facilitate decontamination.
9. Vacuum Lines must be protected with liquid disinfectant traps and high-efficiency particulate air (HEPA) filters or filters of equivalent or superior efficiency and which are checked routinely and maintained or replaced as necessary.

10. Hypodermic needles and syringes are to be used only for parenteral injection and aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable syringe-needle units shall be used for the injection or aspiration of potentially infectious materials. Needles must not be bent, sheared, replaced in the sheath or guard, or removed from the syringe following use. The needle and syringe must be promptly placed in a puncture-resistant container.

11. A ducted exhaust air ventilation system must be provided. The system must create directional airflow that draws air into the work area through the entry area. The exhaust air shall not be recirculated to any other area of the building, shall be discharged to the outside, and shall be dispersed away from the occupied areas and air intakes. The proper direction of airflow, into the work area, shall be verified.

12. Additional training (in addition to Bloodborne Pathogen training associated with occupational exposure) is required for employees in HIV, HCV and HBV research laboratories and HIV, HCV and HBV production facilities. These training requirements include:

- Demonstrating proficiency in standard microbiological practices and in operations specific to the facility.
- Prior experience with human pathogens or tissue cultures before working with HIV, HCV and HBV.
- Extra training for those with no prior pathogen experience. A progression of proficiency testing should be followed which included, initially, work that includes no potentially infectious materials.

In addition, a laboratory specific Biosafety Manual must be prepared and periodically reviewed. Personnel must be advised of potential hazards, required to read instructions on practices and procedures and follow those practices and procedures.

13. An autoclave for decontamination of regulated waste shall be available within, or as near as possible to the work area.
5.4 Occupational Exposure Training

Employees who, as a result of assigned job duties, fall into the category as having “occupational exposure”, defined as reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials, must receive Bloodborne Pathogen Training:

1. At the time of initial assignment to tasks where occupational exposure may take place
2. At least annually
3. Whenever changes such as modification of tasks or procedures or institution of new tasks or procedures affect the employee’s occupational exposure.

At a minimum, Bloodborne Pathogen training for Rensselaer employees with “occupational exposure” will include:

- A copy and explanation of the Rule
- A general explanation of the epidemiology and symptoms of Bloodborne diseases
- An explanation of modes of Bloodborne pathogen transmission
- An explanation of the Plan and means by which a copy can be obtained
- Methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials
- Engineering controls, work practices and types of personal protective equipment
- The basis for selection, location, proper use and limitations, removal, handling, decontamination or disposal of one-time use or re-usable items
- Requirements for signs and labels including the labeling or use of red containers for soiled laundry, potentially contaminated trash or biological waste
- Information on the effectiveness, safety, method of administration, benefits of the HBV vaccine, and availability from the employer at no cost to the employee
- Instruction on the proper action to take and persons to contact in an emergency involving blood or Other Potentially Infectious Materials, and the procedures to follow if an exposure incident occurs, including method of reporting and the medical follow-up
- Information on the post-exposure evaluation and follow-up that the employer is required to provide following an exposure incident
- An interactive question and answer session between students and instructors.
5.5 General Awareness Training

As part of Rensselaer’s new employee safety orientation program, all employees receive a general overview of the risks associated with Bloodborne Pathogens, and measures that can be employed to help prevent infection. In addition, employees that do not have occupational exposure at Rensselaer, but who express a desire to receive the occupational exposure module of Bloodborne Pathogen training, will be allowed to do so during their normal work schedule.

Section 6. Exposure and Evaluation

6.1 Exposure Determination/Incident Evaluation and Follow up

In the event that significant evidence exists that an individual believes that an exposure incident may have occurred, a methodical review of the incident will be conducted to determine exposure potential, work practice controls, personal protective equipment and the circumstances surrounding the event. The event should immediately be reported to the Office of Environmental Health and Safety. Rensselaer will make available to the employee:

- Documentation of the routes(s) of exposure
- Identification and documentation of the source individual (if possible)
- 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
- If consent is not required by law, the source individual’s blood, if available, shall be tested and the results documented.
- Results from the source individual’s blood testing will be made available to the exposed employee.
- The exposed employee’s blood will be tested as soon as possible after consent has been obtained
- Results and consultation regarding the results of the exposed employee’s blood test.
- Within 15 days of the of the Healthcare Professional’s evaluation and written opinion of the exposure incident, including recommended follow-up, that written opinion will be provided to the exposed employee.

The following page contains specific procedures to follow if a potential Bloodborne Pathogen Incident occurs, provided by Rensselaer’s Occupational Health provider, Occupational Health Services, 2001 Fifth Avenue, Troy.
If you have had a significant exposure to the blood of another individual (such as a needle stick) you need to be informed about your risk of contacting a blood borne illness. The most common blood borne illnesses are Hepatitis B, Hepatitis C and Human Immunodeficiency Virus (HIV).

Exposure to feces, nasal secretions, saliva, sputum, sweat, tears, urine and vomit are not considered to carry Hepatitis B, Hepatitis C or HIV unless they contain visible blood.

**First Things First - Wash**  – Wounds and exposed skin should be washed thoroughly with soap and water, and mucous membranes flushed with large amounts of water as soon as possible after exposure.

**Evaluate the Source**  – When possible the person whose blood was the source of the exposure should be tested for Hepatitis B, Hepatitis C and HIV infection. When the source person cannot be tested, then available data (including medical diagnosis, symptoms, and history of risk behaviors) should be used to assess the source persons risk of infection.

**Risk of Disease**  – Your risk of infection from HIV, Hepatitis B or Hepatitis C depends on whether the source of your exposure was infected, and on how much blood passed between you, and by what route.

- **No Risk**  – If the source person whose blood you were exposed to is not infected with any blood borne pathogens, then you are not at any risk from the exposure regardless of amount or type of exposure.
- **Low Risk**  - If the source person whose blood you were exposed to is infected with a blood borne pathogen but the blood only splashed on intact skin you would be at very low risk of disease.
- **Intermediate Risk**  - If the source person whose blood you were exposed to is infected with a blood borne pathogen and the blood splashed on broken skin or mucous membranes (such as in the eyes) you would be at intermediate risk of disease.
- **High Risk**  - If the source person whose blood you were exposed to is infected with a blood borne pathogen and the blood passes directly into your bloodstream (such as a contaminated needle stick) you would be at high risk of disease.

Even in the cases of high risk exposure the likelihood that you will become ill is relatively small. For Hepatitis B the risk is 37-62%. For Hepatitis C the risk is 1.8%. For HIV the risk is 0.3%. The risk of Hepatitis B or HIV infection can be further reduced by accepting preventative treatment when appropriate.
Hepatitis B
Immunization
- If you have already been immunized you are probably already protected from Hepatitis B. We recommend that you have a blood test to measure levels of antibody against Hepatitis B in your blood.
- If you have not been immunized against Hepatitis B, we recommend you start the Hepatitis B vaccination series immediately.

Hepatitis B Immune Globulin (Antibodies to Hepatitis B)
- If you are exposed to blood from a person known to have Hepatitis B or known to be at high risk for Hepatitis B AND you have not been immunized against Hepatitis B or have been found NOT to have antibodies against Hepatitis B, then we recommend you receive Hepatitis B Immune Globulin for immediate protection from infection.
- The incubation for Hepatitis is weeks long, so we can usually test the source for infection, and you for antibodies, before deciding whether Immune Globulin should be given.

Hepatitis C
Immunization
- No immunizations are available for Hepatitis C

Immune Globulin
- Immune globulin and antiviral medications are not recommended as prevention after exposure to infected blood.

Blood tests
- Blood tests for antibodies to Hepatitis C are recommended to see if infection occurs. If infection to Hepatitis C occurs, you will be referred for medical management to a specialist knowledgeable in this area.

HIV
Immunization – There is no immunization (yet) against HIV
Post-Exposure Prophylactic (Preventive) Medications
- Studies in workers exposed by needle stick to HIV show that by taking antiviral medications very soon after exposure the risk of infection can be reduced by almost 80%. The sooner the medications are given, the more effective they are at preventing infection. Optimally, these medications should be started within 2 hours of exposure.
- We may not be able to determine whether the source of your exposure was HIV positive in sufficient time to permit timely treatment. In high risk exposures, we therefore recommend that you accept prophylactic treatment while we wait for the
blood tests on the source. If the test for HIV in the source are later negative, then you can stop the prophylactic medications.

- However, most occupational exposures to HIV do not result in HIV transmission and since the preventive antiviral medications have a number of potential side effects, we must weigh the risk of HIV infection against the risk of side effects from the medications.

- Prophylactic treatment for HIV consists of two and sometimes three antiviral medications

### Antiviral medications for Potential HIV Exposure

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Possible Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Combivir</strong></td>
<td>1 pill 2 times a day for 4 weeks</td>
<td>Nausea, Diarrhea, Headache, Fatigue, Abdominal Pain</td>
</tr>
<tr>
<td>(Zidovudine 300mg &amp; Lamivudine 150mg)</td>
<td>2 pills 3 times a day for 4 weeks take pills on an empty stomach (1 hour before or 2 hours after eating)</td>
<td>High Blood Sugar, Kidney Stones</td>
</tr>
<tr>
<td><strong>Crixivan</strong></td>
<td>400mg</td>
<td></td>
</tr>
<tr>
<td>(Indinivir)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- It is important to take all your medication, on time and every day in order for the treatment to be effective.

- If you decide to take prophylactic medication, we will provide you with the initial doses of medication and prescriptions for the remaining doses. If this is an occupational exposure, save your receipts from buying the medications and submit them to your workers compensation carrier for reimbursement.

- If you think you are having any side effects from the medications please contact our office at 274-9126. Please seek medical evaluation at once if you develop: a rash, fever, back pain, abdominal pain, pain on urination, blood in your urine, or symptoms of high blood sugar including (constant thirst, frequent urination, fatigue, blurred vision, frequent infections, slow healing injuries, unplanned weight loss).

### Blood Tests

- Before starting prophylactic treatment we will draw blood tests to check your blood count and liver function. This is because, rarely, the medications can effect bone marrow and liver. If these effects occur, they usually go away when the drug is stopped.
● 2 weeks after prophylactic medication is started blood work will be drawn again to check your blood count, complete metabolic panel including kidney and liver function and glucose along with checking a urinalysis

Follow Up Blood Work
If the source is found to be infected with Hepatitis B, Hepatitis C or HIV, or the source’s infection status is unknown, we will offer repeat blood tests at 6 weeks, 12 weeks and 24 weeks after exposure to check for possible infection. This testing should be done even if prophylactic treatment was not done.

Life Style Precautions
Unless the source is proven to be uninfected with Hepatitis B or HIV OR until your 24 week blood test comes back negative for infection, we recommend the following precautions:

● Avoid pregnancy
● Do not breast feed
● Use barrier methods of protection during sexual activity. This includes the use of a condom during sexual intercourse.
● Do not donate blood, plasma, organs or semen

Questions – If you have any additional questions or concerns please feel free to contact our office at 274-9126

Practicing good prevention
Reduces exposure to bloodborne pathogens.

Early prophylactic treatment after exposure
Reduces the risk of infection with bloodborne pathogens.
6.2 HBV Vaccination

Hepatitis-B vaccine helps to prevent both HBV infection and those diseases related to HBV infection. HBV vaccines are made using recombinant DNA technology, and contain only a portion of the HBV surface antigen. The vaccine does not contain any live components. The vaccine is administered in a series of three intramuscular doses. Within 10 days of initial assignment to a task, which involves “occupational exposure”, and after the training discussed in section 5.3 has been completed, employees will be offered, at no cost, the Hepatitis-B vaccine and vaccination series. Rensselaer will insure that all laboratory tests are performed at accredited, properly licensed facilities. If the employee has already received the vaccination series, antibody testing will be conducted to confirm immunity. The employee is under no obligation to submit to the vaccination series. Also, if the employee initially declines the Hepatitis-B vaccination but at a later date, while still completing job related tasks with “occupational exposure”, decides to accept the vaccination, it will be offered to that employee at no cost.

6.3 HBV Declination Form

Employees that decline to accept the HBV vaccination series must complete the “HBV Declination form” included in Appendix A. As previously stated, if the employee initially declines the Hepatitis-B vaccination but at a later date, while still completing job related tasks with “occupational exposure”, decides to accept the vaccination, it will be offered to that employee at no cost.
Section 7. Record keeping

7.1 Medical Records

Medical records will be maintained for each employee with “occupational exposure”. These records will include:

- The name and social security number of the employee
- A copy of the employee’s Hepatitis-B vaccination status including the dates that the Hepatitis-B vaccinations and any medical records relative to the employee’s ability to receive the vaccination
- A copy of all results of examinations, medical testing and follow-up procedures
- Rensselaer’s copy of the Healthcare Professional’s written opinions
- A copy of information provided to the Healthcare professional

All medical records will be kept strictly confidential.

7.2 Training Records

Training records will be maintained for a minimum of three years after the date in which the training occurred and will contain:

- The dates of the training session
- The contents of the training
- The names of the trainer(s)
- Job title of employee

7.3 Waste Transportation and Disposal

Regulated Medical wastes are sent for disposal at a licensed facility utilizing a commercial vendor. New York State “Regulated Medical Waste Tracking Forms” are utilized to track shipments. These records are maintained in the Office of Environmental Health and Safety, Blaw Knox II.
Section 8. Annual Review

8.1 Exposure Control Plan Annual Review

Whenever necessary and at least annually, the Office of Environmental Health and Safety will review the contents and associated practices of Rensselaer’s Bloodborne Pathogen Exposure Control Plan. This review, and any necessary updates, will reflect new and/or modified tasks at Rensselaer, new employee positions at Rensselaer, which include occupational exposure and any new procedures associated with positions identified as having occupational exposure.

Further, this review shall include and reflect changes in technology that eliminate or reduce exposure to Bloodborne Pathogens. These improvements in technology will be reviewed by the Office of Environmental Health and Safety and evaluated for potential effectiveness. The comments of a portion of employees who would potentially be required to utilize new equipment will be considered prior to the implementation of any new devices or procedures.
Appendix A. HBV Declination Form

HEPATITIS B VACCINATION DECLINATION FORM

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 the hepatitis B vaccine, at no charge to myself; however, I decline the hepatitis B vaccine 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.

NAME: ___________________________________________

SIGNATURE: ______________________________________

SOCIAL SECURITY #: ________________________________

LOCATION / DEPT.: _______________________________

DATE: ___________________________________________
Appendix B. Job Classifications

**Category I: Class A. Occupational Exposure**

Tasks that involve exposure to human blood, body fluids, or tissues. All procedures or other job related tasks that involve an inherent potential for mucous membrane or skin contact with human blood, body fluids, or tissues are Category I tasks. Category I job classifications include:

- all campus medical doctors, dentists, nurses, physician’s assistants, medical lab technicians, nursing assistants, public safety, athletic trainers, lifeguards, designated first aid providers, and child care workers.
- Also included are researchers, instructors and student employees who work in laboratories or clinics where human blood and Other Potentially Infectious Materials are used, regardless of frequency.

**Category II: Class B. Occupational Exposure**

Tasks that involve no exposure to human blood, body fluids, or tissues but employment may require performing unplanned Category I tasks. The normal work routine involves no exposure to human blood, body fluids or tissues. But exposure or potential exposure may be required as a condition of employment. Appropriate PPE will be provided to every employee engaged in Category II tasks. Category II job classifications include:

- first aid responders, environmental health services, resident assistants, veterinarians and persons charged with the clean up of blood or Other Potentially Infectious spills

**Category III: General Awareness**

Tasks that involve no exposure to human blood or Other Potentially Infectious Materials (although situations may be imagined or hypothesized under which anyone, anywhere, might encounter potential exposure to body fluids). Persons who perform these tasks are not called upon as part of their employment to perform or assist in emergency medical care or first aid or to be potentially exposed in some other way. Category III job classifications include:

- drivers, dockworkers, auto mechanics, grounds personnel, accountants, clerical staff, office personnel, management personnel and facility repair workers.
Appendix C. Training Lesson Plan

I. Introduction
   A. Discussion of Integral terms

II. Video Aid
   A. What Bloodborne Pathogens are
   B. How Bloodborne Pathogens may be transmitted.
   C. Preventing Exposure
   D. Post Exposure Procedures

III. RPI Specific Procedures
   A. Analyze specific “Routes of Entry” and discuss associated PPE
   B. Decontamination Procedures including work practice controls and “hands on PPE use
   C. Containerization and Labeling

IV. Vaccination
Appendix D. Employee Solicitation Form

The purpose of this form is to solicit employee ideas and suggestions regarding changes and/or improvements in technology designed to eliminate or reduce exposure to Bloodborne Pathogens. The Office of Environmental Health and Safety, and individuals from your department, will review ideas that you may have, or products that you may wish to submit for consideration for use at Rensselaer.

Name:___________________________ Date:_________________________

Contact Number:_______________ Dept.:________________________

Comments:____________________________________________________________
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