

Bloodborne Pathogens Training

OSHA Standard 29 CFR 1910.1030



Who needs this training?

- OSHA regulations require this training for any employees who could “reasonably anticipate” facing contact with blood or other potentially infectious materials while performing their job duties.
- At University of New Haven, this includes all employees, faculty, and also students who might come into contact with bloodborne pathogens (BBP) at any point while working on campus.
- **Exception:** “Good Samaritan” acts such as assisting a co-worker with a nosebleed would NOT be considered occupational exposure.

Why do we need it?

- To ensure employees and students are familiar with BBP and UNH's Exposure Control Plan.
- To meet the University's requirements under the OSHA Bloodborne Pathogens Standard.
- To reduce occupational exposure to bloodborne pathogens that employees may encounter in the work place.

When?

- Prior to working with or around blood or other bodily fluids.
- At the beginning of each semester for faculty and students.
- On an annual basis at a minimum.
- Whenever the Exposure Control Plan has been revised.

Training Topics

- OSHA's Bloodborne Pathogen Standard
- Review of the University of New Haven Exposure Control Plan
- Types of bloodborne diseases and their symptoms
- Types of Biosafety Levels and lab requirements
- Administrative and engineering controls
- Proper use of equipment (decontamination, donning PPE)
- Hazard Communication

29 CFR 1910.1030(g)(2)(vii)



OSHA Bloodborne Pathogens Standard

- Originally aimed at:
 - Hospitals, first responders, dental practices
- Non-medical classifications are now covered such as:
 - Researchers that handle blood or infectious materials (clinical lab work, etc.)
 - Funeral directors or morticians
 - Police crime labs (forensics)
 - Barbers and cosmetologists
 - Maintenance and custodial workers
 - Housekeeping and laundry services
 - Waste handling and disposal services

[eCFR :: 29 CFR 1910.1030 -- Bloodborne pathogens.](#)



What are Bloodborne Pathogens?

- Pathogenic organisms that are present in human blood and can cause disease in humans.
- The primary agents that are heavily focused on and identified in the standard:
 - Hepatitis B Virus (HBV) – causes Hepatitis B
 - Human immunodeficiency virus (HIV) – causes AIDS
 - Hepatitis C Virus (HCV)
- Other agents can include:
 - Viral hemorrhagic fever
 - Viruses that cause malaria or syphilis

29 CFR 1910.1030(b)



Human Immunodeficiency Virus (HIV)

- Virus that causes *acquired immunodeficiency syndrome*, otherwise known as AIDS.
- First reported in 1981, has since become a worldwide epidemic.
- Individuals who contract the HIV virus, have what is called HIV infection. They will eventually develop AIDS as a result.
- HIV progressively destroys the body's ability to fight infections and certain cancers by killing or damaging the cells of the immune system.
- Symptoms of HIV infection range from an asymptomatic state , to severe immunodeficiency and associated opportunistic infections, neoplasms, and other conditions.
- Initial infection can be followed by the following symptoms:
 - Fever, sweats, muscle pain, rash, and a sore throat

Hepatitis B Virus (HBV)

- A Hepatitis B vaccine has been available since 1982, and routine Hepatitis B vaccinations have greatly reduced the rate of disease among children and adolescents.
- About one-third of persons infected with HBV have no signs or symptoms. Symptoms can include:
 - Jaundice
 - Fatigue and joint pain
 - Abdominal pain
 - Loss of appetite
 - Nausea, vomiting
- Transmission of the Hepatitis B virus occurs when an infected person's blood or bodily fluids enter the body of a person who is not immune.

Hepatitis C Virus (HCV)

- The Hepatitis C virus (HCV) is a major cause of acute hepatitis and chronic liver disease, including cirrhosis and liver cancer
- Approximately 80% of the persons infected with HCV have no signs or symptoms. Those that have symptoms and signs may exhibit the following:
 - Jaundice
 - Fatigue and nausea
 - Dark urine
 - Abdominal pain
 - Loss of appetite
- Chronic infections occur in 75-85% of infected persons, and chronic liver disease occurs in 70% of infected persons. Currently, there is no vaccine for HCV.

“Other Potentially Infectious Materials”

- The following human bodily fluids:
 - Semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, amniotic fluid, saliva, etc.
 - Any bodily fluid that is visibly contaminated with blood
- Unfixed tissue or organs (other than intact skin).
- HIV-containing cell or tissue cultures, organ cultures, and HIV or HBV containing culture medium or other solutions.
- Blood, organs or other tissues from experimental animals infected with HIV or HBV.

29 CFR 1910.1030(b)



How does exposure occur?

- Bloodborne pathogens are transmitted when contaminated blood or bodily fluids enter the body of another person.
- In a workplace setting, this is most likely to occur through:
 - Accidental puncture from 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
 - Contact between broken or damaged skin and infected blood or body fluids
 - Contact of mucous membranes or broken skin with contaminated blood or body fluids

Transmission of BBP


- Unbroken skin forms an impervious barrier, but infected blood or body fluids can enter the system through damaged or broken skin. Examples include:
 - Open sores
 - Cuts
 - Abrasions
 - Acne
 - Even sunburns or blisters or dermatitis
- Mucous membranes (eyes, nose, mouth) can transmit bloodborne pathogens.
 - For example, a splash of contaminated blood to your eye could result in transmission.

Exposure Control Plan

Laboratory Safety

The goal of the University Laboratory Safety Program is to minimize the risk of injury or illness to laboratory workers by ensuring that they have the training, information, support and equipment needed to work safely in the laboratory.

The EH&S Department, in conjunction with Laboratory Managers, provides guidance and oversight to research staff in the following areas; use, storage, and disposal of hazardous materials; the development of specific laboratory safety programs; waste minimization; fume hood evaluations; safety newsletters; and assists with plan reviews related to laboratory renovations.

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- [Bloodborne Pathogens Exposure Control Plan](#)
 - [Chemical Fume Hood Policy](#)
 - [Chemical Hygiene Plan](#)
 - [Compressed Gas Policy and Procedure](#)
 - [Hazard Communication Program](#)
 - [Hazardous Waste Manifest Policy](#)
 - [Laboratory Use for Visitors and Minors Policy](#)
 - Machine Shop Safety Policy
 - Personal Protective Equipment Policy
 - Safety Shower and Eye Wash Policy
 - [Radiation Safety Policy](#)
 - Respiratory Protection Program



Exposure Control Plan Elements

- **Exposure Determination:** Identifies jobs and tasks where occupational exposure to blood or other potentially infectious material occurs.
- **Engineering and work practice controls:** Aims to eliminate or minimize employee exposure to bloodborne pathogens or other potentially infectious materials.
- Outlines groups and/or individuals who will receive this training.
- Describes engineering/administrative controls and work practice controls.
- Ensures use of proper personal protective equipment (PPE).
- Provide medical surveillance to those who may be exposed.
- Offers Hepatitis B Vaccinations.
- Hazard communication or usage of signs and labels in areas where risk may exist.

29 CFR 1910.1030(c)(1)



Exposure Control Plan Requirements

- ✓ Must have a written plan.
- ✓ Must be reviewed at least annually to reflect any changes in:
 - ✓ Tasks, procedures, or assignments which affect exposure
 - ✓ Technology that will eliminate or reduce exposure
- ✓ Must solicit input from potentially exposed employees in the identification, evaluation and selection of engineering and work practice controls.
- ✓ Must be easily accessible to employees.

29 CFR 1910.1030(c)(1)



Universal Precautions

- Best management practice is to treat all human blood and bodily fluids as if they are infectious.
- Precautions must be observed in all situations where there is a potential for contact with blood or other potentially infectious materials.

29 CFR 1910.1030(d)(1)



Laboratory Biosafety Levels

BIOSAFETY LEVELS

basic classes of laboratory risks from low to high



BSL-1



BSL-2



BSL-3



BSL-4



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Laboratory Biosafety Levels (BSL)



BSL-1



Working with agents not known to consistently cause disease in healthy adults and present minimal potential hazard to laboratory personnel and the environment.

Examples: *E. Coli strain K12, Lactobacillus acidophilus*



BSL-2



Working with agents associated with causing human disease and pose moderate hazards to personnel and the environment.

Examples: *Mycobacterium, Streptococcus pneumonia, Salmonella choleraesuis*

Laboratory Biosafety Levels (BSL)



BSL-3



Working with indigenous or exotic agents that may cause serious or potentially life-threatening disease through the inhalation route of exposure.

Examples: *HIV, Mycobacterium tuberculosis, Rabies virus*



BSL-4



Working with dangerous and exotic agents that pose a high risk of aerosol-transmitted laboratory infections and life-threatening diseases that are frequently fatal, agents for which there are no vaccines or treatments, or work with a related agent with unknown risk of transmission.

Examples: *Ebola virus, Hemorrhagic viruses*

Individuals Working in BSL-2 Laboratories

- UNH only has BSL-1 and BSL-2 labs.
- Laboratory personnel working with BSL-2 strains must receive specific training in the proper handling of these human diseases causing pathogens.
- Access to BSL-2 labs must be restricted to authorized personnel only whenever work is being conducted with these strains.
 - Keep lab doors shut preferably with badge access only.
- All procedures in which aerosols or splashes may be created while working with these strains must be conducted in a BSC (Biological Safety Cabinet).

Engineering and Work Practice Controls

- **Goal:** Aim to eliminate or minimize employee exposure to bloodborne pathogens or potentially infectious materials.
- **Engineering Controls:** Devices and equipment that isolate and contain a hazard. The best engineering controls function with a minimum of user input and may, to a degree, compensate for human error. Examples include:
 - Biosafety Cabinets
 - Sharps containers
- **Work practice controls:** Procedures that reduce the likelihood of exposure by altering the way in which a task is performed. Examples include:
 - Handwashing
 - PPE
 - Prohibition of food and drink
 - Decontaminating surfaces

29 CFR 1910.1030(d)(2)



Types of Work Practice Controls



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Work Practice Controls: Handwashing

The simplest and most effective work practice used to prevent transmission of bloodborne pathogens is to wash your hands!

Remember:

- Thoroughly wash hands or other exposed skin with soap and water as soon as possible following an occupational exposure to blood or other potentially infectious materials.
- If skin or mucous membranes come in direct contact, wash or flush the area with water as soon as possible.
- Where handwashing facilities are not immediately available, use antiseptic hand cleansers or antiseptic towelettes until you are able to get to a sink and wash your hands.

29 CFR 1910.1030(d)(2)(vi)



Proper Handwashing Technique

- Turn on faucets to comfortable water temperature
- Wet hands, apply soap
- Rub with friction for at least **15 seconds**, making sure to wash back of hands, fingers, fingertips, nails, and in between fingers
- Rinse with fingertips pointing downwards
- Dry hands with paper towel
- Discard paper towel and turn off faucets with a clean paper towel

Work Practice Controls: Prohibition of Food and Drink

- Eating, drinking, smoking, applying cosmetics or lip balm, or handling contact lenses are **prohibited** in any work areas where you may be exposed to blood or other potentially infectious materials.
- Food and drink shall never be kept in refrigerators, freezers, shelves, cabinets or on countertops or benchtops where blood or other potentially infectious materials are present.
- **One Exception:** If there is a lab experiment that involves using food or drink products, just make sure these are labeled as “Lab Use Only” or “Do Not Eat”.

Work Practice Controls: Cleaning Contaminated Surfaces

- Contaminated equipment (i.e. fume hood, biosafety cabinet or lab bench) should be thoroughly disinfected with an appropriate cleaning solution (i.e. 1:10 dilution of bleach and water)
- All equipment and work surfaces shall be cleaned:
 - After contact with blood or infectious materials
 - After completion of procedures, immediately or as soon as feasible
 - At the end of a work shift
- Appropriate PPE should always be worn while following cleaning procedures.

29 CFR 1910.1030(d)(4)(ii)(A)



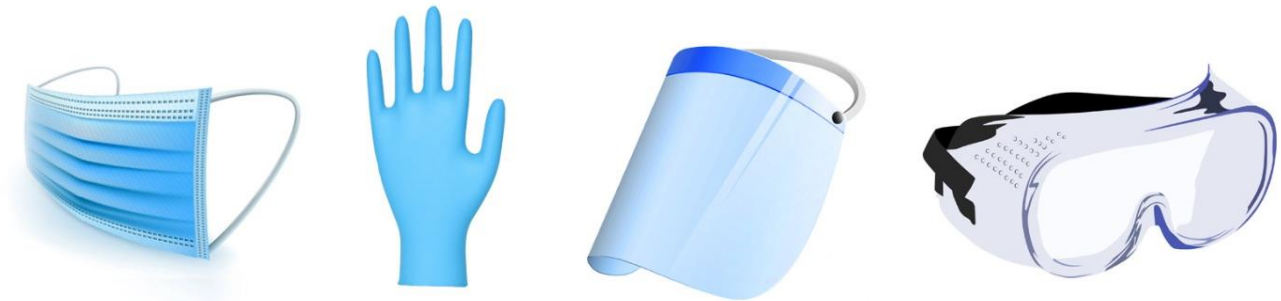
Work Practice Controls: Cleaning Contaminated Surfaces

- The Center for Disease Control (CDC) states that the Hepatitis B virus can live in **dried blood** for up to a week. Hepatitis C virus can survive for up to four days.
- Work surfaces that become contaminated with **blood** or other body fluids can expose you to a **bloodborne** disease through cross-contamination.
- Important to properly clean surfaces that have been contaminated as soon as possible.

Work Practice Controls: Personal Protective Equipment

- PPE should be worn whenever there is potential for exposure:

- Gloves
- Lab coat
- Eye Protection
- Mask



- PPE is considered appropriate only if it does not permit blood or other potentially infectious material to reach the individual's clothes, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time that the PPE will be worn.

General Guidelines for PPE Use

- The equipment should be appropriate for the task and should fit properly, especially gloves.
- Persons must use appropriate protective equipment each time they perform a task involving potentially infectious materials.
- PPE should be free from physical flaws that could compromise safety.
- Persons should remove garments such as lab coats or gloves that are penetrated by blood or other potentially infectious materials immediately or as soon as feasible.
- All PPE should be removed prior to leaving the laboratory.

Personal Protective Equipment:

Gloves



- Gloves should be made of latex, Nitrile, rubber, or other water impervious materials.
- Always inspect gloves for visible damage before use, never use gloves that are torn or punctured.
- If you have cuts or sores on your hands, cover these with a bandage or similar protection as an additional precaution before donning gloves.
- Replace gloves as soon as practical once contaminated, or in the event the gloves becomes compromised.
- Gloves are designed to be **single use only**. Please dispose of after use.

29 CFR 1910.1030(d)(3)(ix)

Personal Protective Equipment: Eye Protection



- Bloodborne pathogens can be transmitted through the mucous membranes of the eye.
- Eye protection shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose or mouth contamination can be reasonably anticipated.
 - This includes while cleaning up a spill.
- If blood or potentially infectious materials are splashed into your eye, you must flush your eye with clean, running water for 15 minutes.

29 CFR 1910.1030(d)(3)(x)

Personal Protective Equipment: Mask & Face Protection

- Masks and face shields provide additional protection for tasks that may generate splashes, spray, spatter, or droplets of blood or other potentially infectious materials, and eye, nose, or mouth contamination can be reasonably anticipated.
- Masks and face shields are not a substitute for eye protection, and must be used in combination with suitable eye protection.

Personal Protective Equipment: Lab Coats

- Appropriate protective clothing including, gowns, aprons, lab coats, clinic jackets or other similar outer garments shall always be worn in occupational exposure situations.
- The type and characteristics will depend upon the task, and degree of exposure anticipated.



29 CFR 1910.1030(d)(3)(xi)

Removing Personal Protective Equipment

Proper method of removing (doffing) PPE:

1. Remove gloves by grasping outside of one glove with other gloved hand and peel off. Hold removed glove in gloved hand.
2. Slide fingers of ungloved hand under remaining glove to remove. Discard both gloves.
3. Remove any PPE from face next, handling by head bands, ear pieces, or ties. Discard.
4. Remove gown by pulling away from neck and shoulders, touching ties only. Pull arms out of sleeves, turning the gown inside out and away from body. Discard.
5. **Wash hands!! Even after wearing protective gloves.**

29 CFR 1910.1030(g)(2)(vii)(G)



Hazard Communication – Labels & Signs



Hazard Communication

All biohazardous materials, including waste, must be labeled appropriately with the biohazard symbol.

- Tags and Labels
 - Must be fluorescent orange or red-orange
 - Must have biohazard symbol in contrasting color
- Bags
 - Must have biohazard symbol in a contrasting color
 - Must be red in color
 - Must be leak proof



29 CFR 1910.1030(g)(1)(i)

Biohazard Warning Labels













- Biological warning labels are required on:
 - Containers of regulated medical waste
 - Refrigerators and freezers containing blood and other potentially infectious materials
 - Any other containers used to store, transport or ship blood or other potentially infectious materials
- Labels must be affixed as close as feasible to the container by string, wire, adhesive, or other method to prevent unintentional removal.

29 CFR 1910.1030(g)(1)(i)

Laboratory Signage

UNH SAFETY INFORMATION CARD

 **CAUTION:** The following hazards are present within this area:

<input checked="" type="checkbox"/>  Flammables Self Reactives Pyrophorics Self-Heating Emits Flammable Gas Organic Peroxides	<input checked="" type="checkbox"/>  Carcinogen Respiratory Sensitizer Reproductive Toxicity Target Organ Toxicity Mutagenicity Aspiration Toxicity	<input checked="" type="checkbox"/> Biohazards
<input type="checkbox"/>  Oxidizers	<input checked="" type="checkbox"/>  Irritant Dermal Sensitizer Acute toxicity (harmful) Narcotic Effects Respiratory Tract Irritation	 BIOHAZARD
<input type="checkbox"/>  Explosives Self Reactives Organic Peroxides	<input checked="" type="checkbox"/>  Acute Toxicity (severe)	
<input checked="" type="checkbox"/>  Corrosives	<input type="checkbox"/>  Gas Under Pressure	<input checked="" type="checkbox"/> Human pathogens <input type="checkbox"/> Viral vectors
<input type="checkbox"/> Strong Magnetic Field	<input type="checkbox"/> Laser (Class _____)	BSL <input type="text" value="BSL-2"/>
<input type="checkbox"/> Electrical Hazard	<input type="checkbox"/> Radioactive Material	<u>Special procedures required for entry or exit:</u> Bloodborne Pathogens Training; PPE: safety glasses, lab coats, closed toe shoes, gloves



All UNH Labs have signage outside the door that describes the hazards present within the space.

Biological Waste Management and Spill Clean-up



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Disposal of Contaminated Sharps

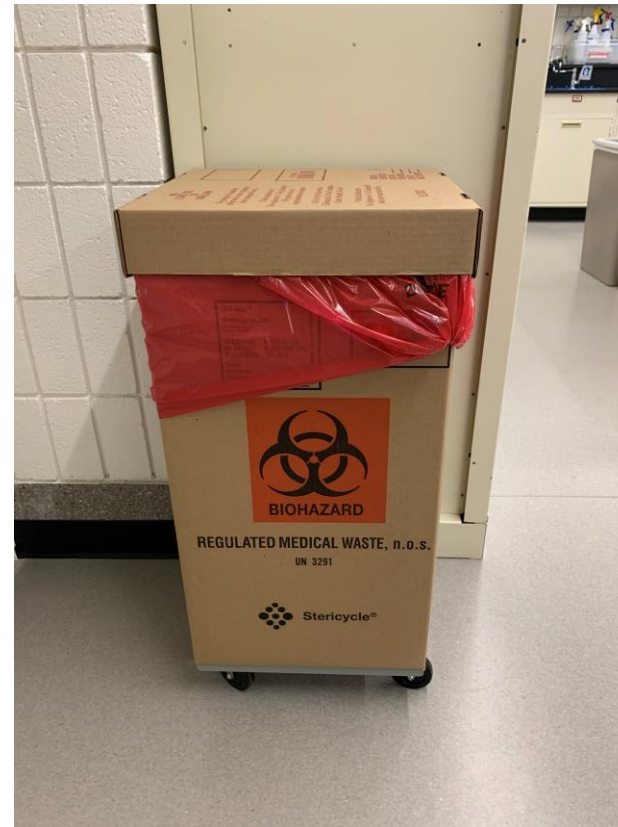
- Contaminated sharps must be placed in an appropriate container immediately or as soon as possible after use.
- Sharps containers must be:
 - Puncture resistant
 - Labeled or color coded in accordance with the standard (i.e. shade of orange with biohazard symbol)
 - Leak proof on sides and bottom
 - Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used
 - Maintained upright throughout use
 - Replaced routinely and not be allowed to overfill



29 CFR 1910.1030(d)(4)(iii)(A)

Other Regulated Waste Containment

- Any other wastes that are contaminated with blood or other potentially infectious materials must be disposed of in an approved biohazard cardboard box.
- Once sharps containers have been filled and closed, they can be placed into one of these bio boxes for disposal.



29 CFR 1910.1030(d)(4)(iii)(B)

Proper Bio Box Packaging Requirements

- Biological waste boxes with closable lids are by provided by Stericycle.
- Biological waste bags must be used to line the box to prevent leakage of fluids, and then once filled, the bag must be tied closed.
- Packing tape must be used on both the bottom and top of the box to ensure it is closed completely to prevent spillage or protrusion of the contents during handling, storage and transport.



29 CFR 1910.1030(d)(4)(iii)(B)(1)

Clean-up for Minor and Major Spills

- All biological waste spills shall be immediately cleaned up by appropriate staff that understand precautions and clean up procedure.
- If you have not been authorized to clean up biohazardous spills, please contact your Supervisor, Instructor, or your department's Laboratory Manager immediately.



Steps for Proper Clean-up

1. Properly secure the area from unauthorized entry.
2. Wear appropriate PPE.
3. Apply absorbent to spill.
4. Apply half of the disinfectant (1:10 water and bleach solution) to the target area, and wait 20 minute for sufficient contact time.
5. Use forceps to remove any sharps and transfer to approved sharps container.
6. Use dust pan and brush to remove debris and dispose of in approved bio-hazardous waste container.
7. Clean up with paper towel and/or spill pads.
8. Pour the remainder of the disinfectant on the target area, and wipe down area one final time to ensure decontamination.
9. Remove PPE and thoroughly wash hands.

Exposure Follow-up and Hepatitis B Vaccination



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What to do if an exposure occurs?

- If an individual gets exposed to blood or any other potentially infectious material, the proper precautions must be taken:
 - **If on cut/wound on the skin:** wash the exposed area with soap and water.
 - **If in the nose, mouth or eyes:** flush with water for at least 15 minutes.
 - Exposure must be reported through the Accident/Incident Report form available on MyCharger: [Work Place Safety - myCharger \(newhaven.edu\)](https://www.newhaven.edu/workplace-safety/mycharger)
 - Ensure employee/student is directed to a healthcare professional.
 - Treatment for any exposure should begin as soon as possible, preferably within 24 hours but no later than 7 days.

Needlestick Exposure

- There is always a risk for exposure when anyone handles sharps or other types of regulated medical waste.
- If an employee or student has been stuck with a contaminated sharp, we need to automatically assume they have been exposed to a possible bloodborne pathogen.
- Upon learning of an exposure incident:
 - Notify your supervisor/instructor immediately
 - Record the incident via the Accident/Incident Form located on the MyCharger Workplace Safety Page.
 - Forward the report to the Department Lab Manager or EHSSafety@Newhaven.edu

Sharps Injury Log

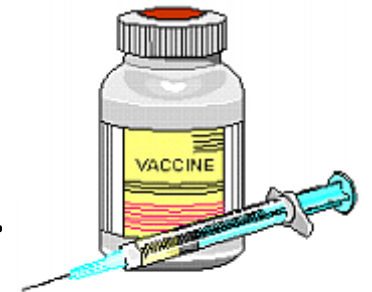
- Employers must maintain a sharps injury log for the recording of injuries from contaminated sharps.
- The log is maintained to ensure employee privacy and must contain the following information:
 - Type and brand of device involved in the incident
 - Location of the incident
 - Complete description of the incident
- The Accident/Incident Form should be as detailed as possible and include all of the above information.

29 CFR 1910.1030(h)(5)(i)



Hepatitis B Vaccination Information

- HBV vaccinations are the most important part of HBV infection control because gloves and other PPE do not prevent puncture wounds or unanticipated exposures.
- Set of three inoculations: 1st two doses administered 1 month apart; last dose is administered 5 months after 2nd dose.
- HBV vaccine is a very safe vaccine, serious reactions are rare.
- Mild symptoms may occur: soreness at injection site, low-grade fever.
- HBV vaccine may be given during pregnancy.
- At least 90% of adults are immune after completing the three doses of vaccine.
- Since 1985, 90% reduction of number of health care workers infected with HBV, largely due to the HBV vaccine.



Hepatitis B Vaccination Requirements

- Made available to employees who have occupational exposure at no cost to them.
- Performed by or under the supervision of a licensed healthcare professional.
- Employees may decline the vaccine if they choose to do so.
- If employee initially declines the vaccine, they can always change their mind at a later date and still get the vaccine.

Post Exposure Follow-up

- Following an Accident/Incident Report of an exposure incident, it is important to ensure that the route of exposure and how it occurred are documented in the report.
- Record injury in the Sharps Injury Log if applicable.
- Obtain consent from the source individual (if known) and the exposed employee/student and test the blood as soon as possible after the incident.
- Provide risk counseling and offer post-exposure protective treatment for disease when medically indicated in accordance with current Public Health Service guidelines.
- Provide written opinion of findings to employer and provide a copy to the exposed employee/student within 15 days of the evaluation.

29 CFR 1910.1030(f)(3)



Summary

- Please make sure employees and students complete the Bloodborne Pathogens Quiz via Canvas.
- The quiz will allow employees/students to indicate whether they are already vaccinated, or if they choose to accept or decline the vaccine.
- If employees decline the vaccine, they must sign the Hepatitis B Vaccine Declination Form.
- Declination Form can be found at the end of the Exposure Control Plan.
- If you have any questions, concerns, comments, or suggestions regarding the Bloodborne Pathogens Standard and Exposure Control Plan, please feel free to reach out to EHSSafety@Newhaven.edu

Thank You!



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