Department of LABOR AND INDUSTRIES

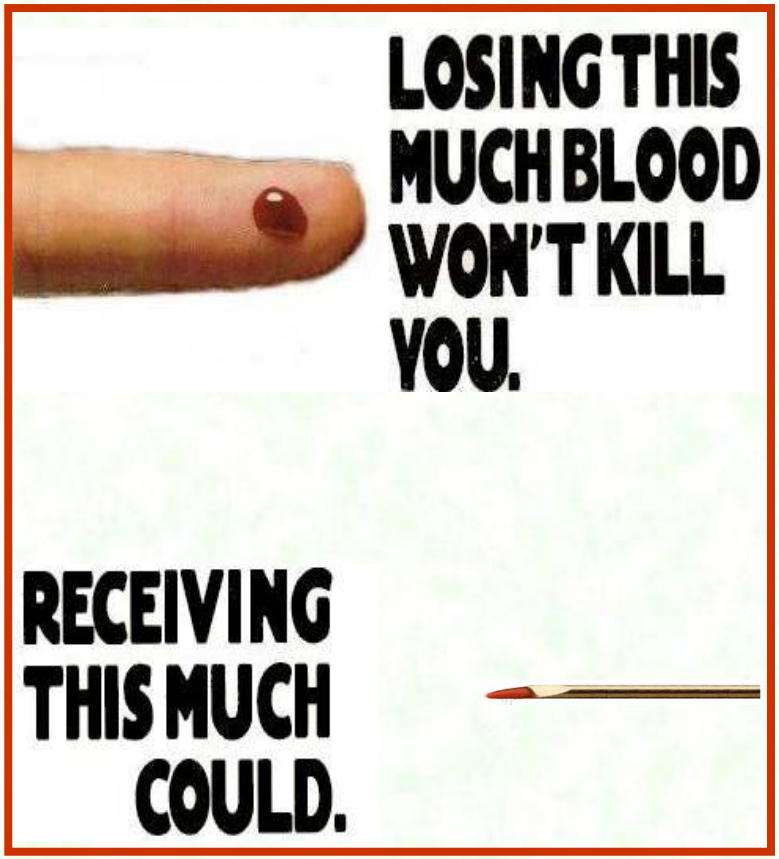
Bloodborne Pathogens
Annual Training

Overview of Hepatitis B Virus, Hepatitis C Virus, and Human Immunodeficiency Virus

Topics Covered

- Why you should know about Bloodborne Pathogens (BBPs)
- General background: organisms and diseases
- BBPs of importance (covered by safety and health rules)
- Hepatitis B Virus
- Hepatitis C Virus
- Human Immunodeficiency Virus
- Exposure control measures
- Safe work practices
- Personal protective equipment

Why should you know about BBPs?



Courtesy of Owen Mumford, Inc.

Infection from a bloodborne pathogen can result in chronic infection, serious illness, and death.

Occupational Exposures

Some jobs with occupational exposure to Bloodborne Pathogens include (but are not limited to) the following:

- Healthcare providers: physicians, nurses, EMTs, home health care workers, etc.
- Medical and research laboratory technicians
- Firefighters, law enforcement personnel, corrections officers
- Workers in laundries that service public safety institutions
- Employees assigned to provide emergency first aid by their employer (as either a primary or secondary duty)
- Employees who handle or pick up regulated waste
- Hotel/motel employees that clean up blood or OPIM
- Employees of funeral homes and mortuaries

Occupational Exposures

The following are job classifications in our establishment in which **ALL** employees considered at risk for occupational exposure to bloodborne pathogens:

- Nurses
- Occupational and Physical Therapist
- Teachers and paraprofessionals of medically fragile and developmentally disabled students
- Designated school first aid providers
- Paraprofessionals assigned to playground and health room duties
- Bus Drivers
- **Elementary and secondary building custodians who clean up after accidents involving blood and dispose of bloody waste materials, particularly in gymnasiums and locker rooms**
- Coaches
- PE teachers

General background

PATHOGEN: a microorganism that can cause disease

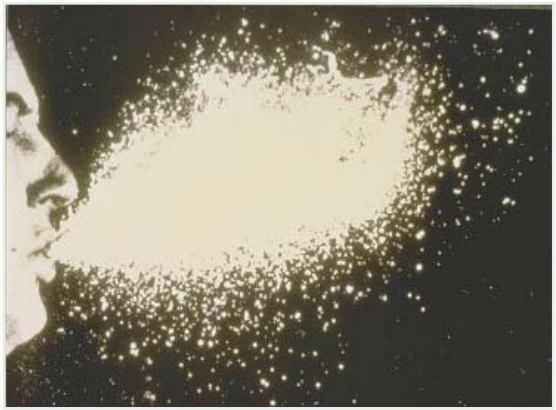
Examples of illnesses caused by pathogens

• **Viruses**	AIDS, Hepatitis B, colds, flu, Herpes
• **Bacteria**	Intestinal diseases, Staph (MRSA), Strep
• **Fungi**	Athlete's foot, Farmer's lung, Asthma/allergies
• **Parasites**	Giardiasis, Malaria, Trichinosis

Transmission of Diseases

The first step in preventing disease is to keep the organism from entering the body. There are three primary routes of entry:

- **Inhalation**
  Air



Infected person coughs or sneezes and spreads the pathogen through the air to others

- **Ingestion**
  Food, water

Infected person doesn't wash hands properly (virus in the feces), handles or prepares food/water and contaminates it

- **Contact**
  Bloodborne

Infected person transmits pathogen through a route that involves blood/mucous membrane/ sexual contact

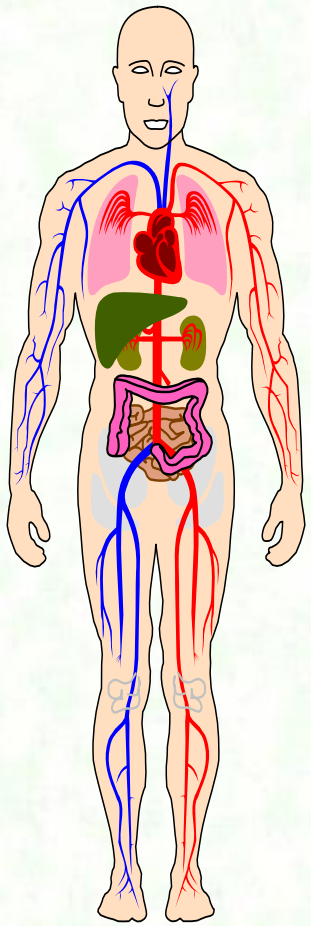
Bloodborne Pathogens (BBPs)

Bloodborne Pathogens: microorganisms that are present in blood or other potentially infectious materials (OPIM) and can cause disease.

Blood

or

OPIM

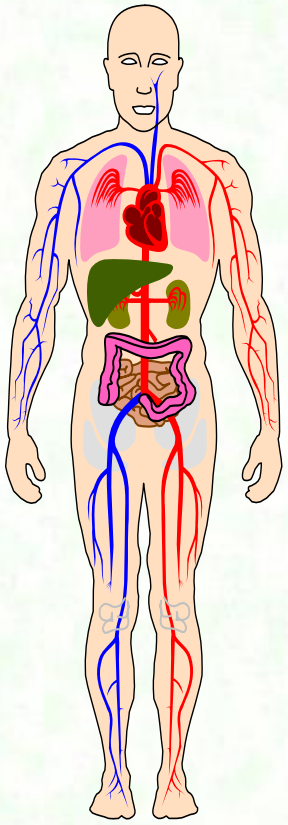


"Blood" includes human blood, human blood components, products made from human blood, and also medications derived from blood (e.g., immune globulins, albumin, etc.)

Bloodborne Pathogens (BBPs)

OPIM

- semen
- vaginal secretions
- body fluids such as pleural, cerebrospinal, pericardial, peritoneal, synovial, and amniotic
- saliva in dental procedures (if blood is present)
- any other body fluids <u>visibly contaminated</u> with blood or OPIM body fluids listed
- body fluid where it is difficult to differentiate



- any unfixed tissue or organ (other than intact skin) from a human (living or dead)
- HIV- or HBV-containing cultures (cell, tissue, or organ), culture medium, or other solutions
- blood, organs, & tissues from animals infected with HIV, HBV, or BBPs

Transmission of BBPs

Occupational Exposure

- means reasonably anticipated skin, eye, mucous membrane, or parenteral (piercing of the skin) contact with blood or OPIM that may result from the performance of an employee's duties

Exposure Incident

- is a specific contact with blood or OPIM that is capable of transmitting a bloodborne disease

Transmission of BBPs

Bloodborne Pathogens can enter your body through

- a break in the skin (cut, burn, lesion, etc.)
- mucus membranes (eyes, nose, mouth)
- sexual contact
- other modes

Transmission of BBPs

Risk of infection depends on several factors:

- The pathogen involved
- The type/route of exposure
- The amount of virus in the infected blood at the time of exposure
- The amount of infected blood involved in the exposure
- Whether post-exposure treatment was taken
- Specific immune response of the infected individual

Bloodborne Pathogen Diseases

Some examples of bloodborne pathogens:

- Malaria
- Syphilis
- Brucellosis
- Leptospirosis
- Arboviral infections
- Relapsing fever
- Creutzfeld-Jakob Disease
- Viral Hemorrhagic Fever

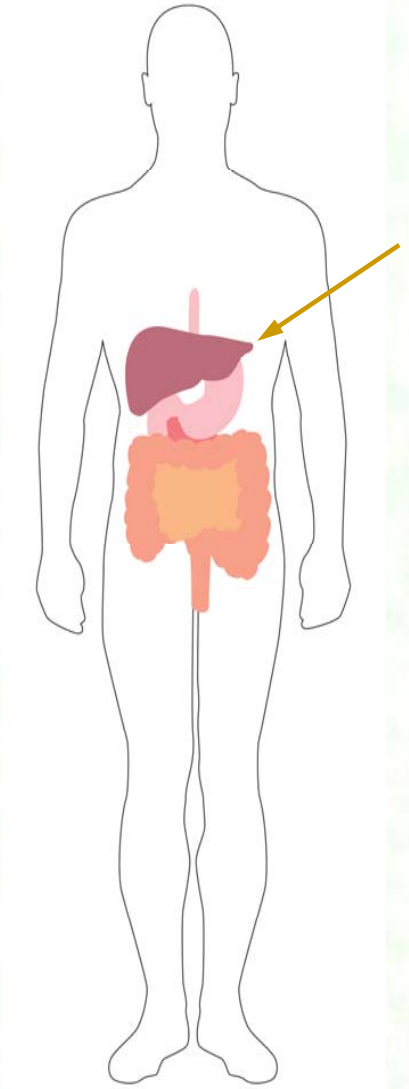
Bloodborne Pathogen Diseases

Main bloodborne pathogens and diseases of concern		
• **Hepatitis B Virus (HBV)**	–	**Hepatitis B**
• **Hepatitis C Virus (HCV)**	–	**Hepatitis C**
• **Human Immunodeficiency Virus (HIV)**	–	**AIDS**

(Note: A person can have two or more infections in the body at the same time. For example,a person having HIV/HCV co-infection has both HIV and HCV.)

Viral Hepatitis - General Overview

- Virus attacks liver ➞ inflammation, enlargement, and tenderness
- Acute and chronic infections
- Possible liver damage ranging from mild to fatal



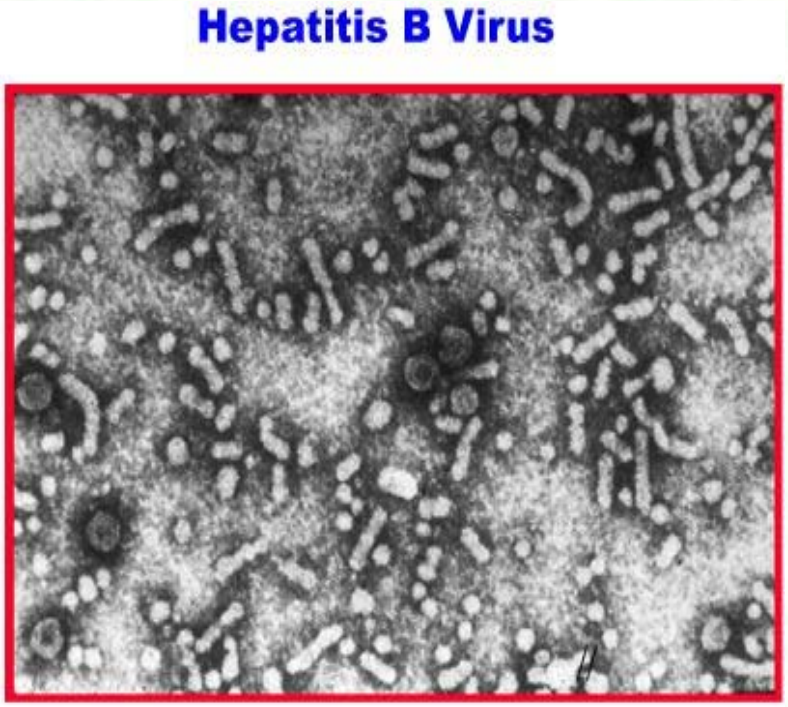
The liver is a large, dark red gland located in the upper right abdomen behind the lower ribs. It functions in removing toxins (poisons) from the blood, in the digestion of fats, and in other body processes.

Courtesy of Schering Corporation

HBV - Hepatitis B

General Facts

- Hearty - can live for 7+ days in dried blood
- 100 times more contagious than HIV
- Approximately 78,000 new infections per year (2001)
- 1.25 million carriers
- Highest rate of disease occurs in 20-49-year-olds CDC 5/2005
- 5,000 deaths/year
- No cure, but there is a preventative vaccine



HBV - Hepatitis B

Clinical Features

Incubation period	Average 60-90 days Range 45-180 days
No sign or symptoms	30%
Acute illness (jaundice)	30%-50% (≥5 years old)
Chronic infection (carrier)	2%-10% (of infected adults)
- Premature death from chronic liver disease	15-25% (of chronically infected)
Immunity	Protected from future infection

HBV - Hepatitis B

Symptoms

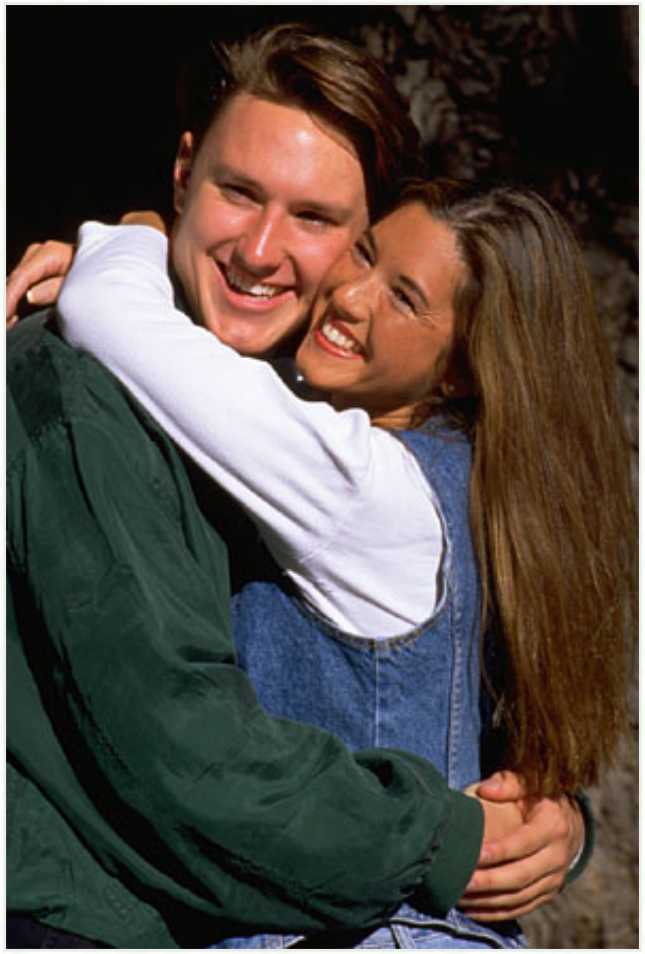
- flu-like symptoms
- fatigue
- abdominal pain
- loss of appetite
- nausea, vomiting
- joint pain
- jaundice

Normal eyes

Jaundiced eyes

HBV - Hepatitis B

HBV Transmission



- Unprotected sex with multiple partners
- Sharing needles during injecting drug use
- From infected mother to child during birth
- Sharps/needle sticks

HCV - Hepatitis C

General Facts

- The most common chronic bloodborne infection in the U.S.
- 4.1 million (1.6%) Americans infected; 3.2 million chronically infected
- 26,000 new infections per year (2004)
- Leading cause of liver transplantation in U.S.
- 8,000-10,000 deaths from chronic disease/year
- No broadly effective treatment
- No vaccine available

Healthy human liver

Hepatitis C liver

A healthy human liver contrasted with a liver from an individual who died from hepatitis C. Note the extensive damage and scarring from chronic liver disease.

HCV - Hepatitis C

Clinical Features

Incubation period	Average 6-7 weeks Range 2-26 weeks
No sign or symptoms	80%
Acute illness (jaundice)	≤20% (Mild)
Chronic infection Chronic liver disease] Age-related	75%-85% 10%-70% (most are asymptomatic)
Deaths from chronic liver disease	1%-5%
Immunity	No protection from future infection identified

HCV - Hepatitis C

Symptoms

- flu-like symptoms
- jaundice
- fatigue
- dark urine
- abdominal pain
- loss of appetite
- nausea

HCV - Hepatitis C

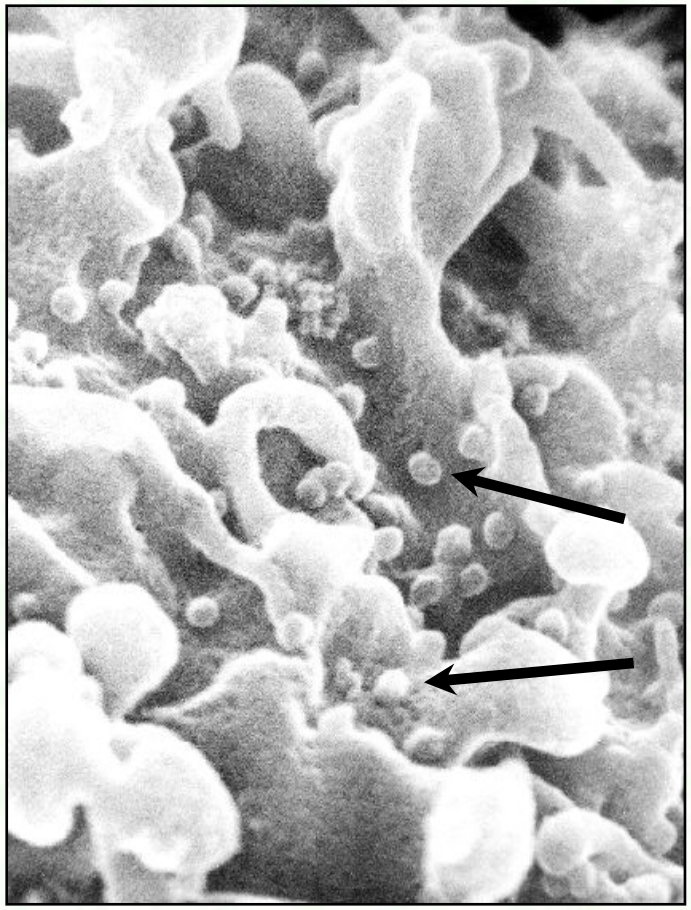
HCV Transmission

- Injecting drug use
- Hemodialysis (long-term)
- Blood transfusion and/or organ transplant before 1992
- From infected mother to child during birth
- Occupational exposure to blood - mostly needlesticks
- Sexual or household exposures - rare

Human Immunodeficiency Virus (HIV)

General Facts

- Fragile – few hours in dry environment
- Attacks the human immune system
- Cause of AIDS
- More than 1 million infected persons in U.S.
- No cure; no vaccine available yet



HIV - seen as small spheres on the surface of white blood cells

Human Immunodeficiency Virus (HIV)

HIV Infection → AIDS

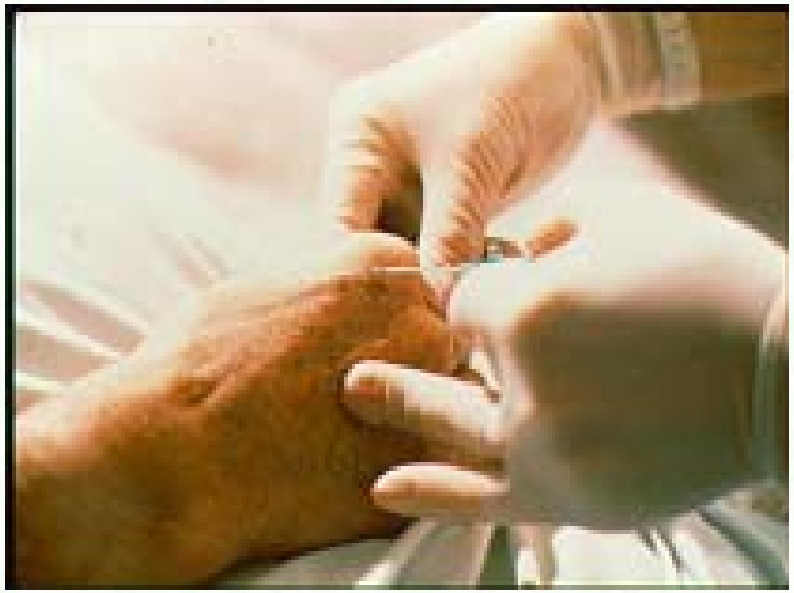
- Many have no symptoms or mild flu-like symptoms
- Most infected with HIV eventually develop AIDS
- Incubation period ≈10-12 yrs
- Opportunistic infections & AIDS-related diseases - TB, toxoplasmosis, Kaposi's sarcoma, oral thrush (candidiasis)
- Treatments are limited; do not cure

Human Immunodeficiency Virus (HIV)

HIV Transmission

- Sexual contact
- Sharing needles and/or syringes
- From HIV-infected women to their babies during pregnancy or delivery
- Breast-feeding
- Needlesticks

Risk of Infection



Risk of infection following needlestick/cut from a positive (infected) source:

HIV 0.3% = 1 in every 250

HBV 6 - 30% = 1 in every 5

HCV 0.5 – 2% = 1 on every 50

Exposure Controls

Reducing Your Risk By

- Following universal precautions
- Using safer medical devices and equipment
- Following proper and safe workplace policies, practices, and procedures
- Using appropriate PPE when contact with blood or OPIM is expected
- Maintaining a clean workplace
- Making sure all contaminated materials are properly labeled

Exposure Controls

UNIVERSAL PRECAUTIONS

– A system of infection control:

TREAT **ALL HUMAN BLOOD** AND **OPIM** AS IF KNOWN TO BE INFECTIOUS WITH A BLOODBORNE DISEASE.

Exposure Control Plan

To eliminate/minimize your risk of exposure the exposure control plan includes:

- An exposure determination to identify employees who are at risk for exposure
- The methods and controls we use to protect you from exposure to bloodborne pathogens
- Training and Hazard Communication requirements
- Post-exposure evaluation and follow-up procedures if you experience an exposure incident
- Record keeping, including documentation of any occupational exposure incidents
- Located in each building Health Room.

Exposure Controls

Safe Work Practices

- Do not eat, drink, smoke, apply cosmetics or lip balm, or handle contact lenses in any work areas where there is the possibility of exposure to blood or OPIM.
- Do not place food or drink in refrigerators, freezers, shelves, cabinets, or on countertops or bench tops in any work areas.

Exposure Controls

Personal Protective Equipment (PPE)

Gloves must be worn when hand contact with blood or OPIM can be reasonably anticipated or when you handle or touch contaminated items or surfaces.

Boxes of latex gloves in glove dispensing rack

Nitrile and vinyl gloves

- Utility Gloves
- *These are used for housekeeping, and must be disinfecting in between uses and replace them before they start to show wear.*

Exposure Controls -

Gloves

- Don’t reuse disposable gloves.
- Change gloves frequently because they might develop pinhole leaks that are not visible but can allow passage of microscopic organisms.
- If you tear or damage your gloves, remove them and wash your hands thoroughly with soap and water before putting on a new pair and also between each glove use.

Exposure Controls

Personal Protective Equipment (PPE)

Remove gloves safely and properly

- Grasp near cuff of glove and turn it inside out. Hold in the gloved hand.
- Place fingers of bare hand inside cuff of gloved hand and also turn inside out and over the first glove.

- Dispose gloves into proper waste container.
- Clean hands thoroughly with soap and water (or antiseptic hand rub product if handwashing facilities not available).

Safe and proper glove removal

Exposure Controls

Regulated Waste

- Liquid or semiliquid blood or other potentially infectious materials (OPIM)
- Contaminated items that would release blood or OPIM in a liquid or semiliquid state, if compressed
- Items that are caked with dried blood or OPIM and are capable of releasing these materials during handling
- Contaminated sharps

Exposure Controls

Disposing Of Contaminated Material And Waste

You must

- Incinerate or decontaminate all regulated waste by a method known to effectively destroy bloodborne pathogens, such as autoclaving.
- Make sure to place materials to be decontaminated away from the work area in a container that is:
  - Durable
  - Leakproof
  - Appropriately labeled, or color-coded
  - Closed before being removed from the work area.

Exposure Control

When Cleaning Hard Surfaces:

- Use disposable (paper) towels and other absorbable materials to absorb the spill;
- Clean the spill area with soap and water;
- Utilize proper disinfectant and follow procedure using school district approved chemical;
- Dispose of waste in container marked for hazardous waste products;

Exposure Control

Laundry

- Handle contaminated laundry as little as possible, with minimal agitation.
- Place contaminated laundry in leak-proof, labeled or color-coded containers before transporting. Use color coded bags or bags marked with the biohazard symbol for this purpose.
- Presoak heavily soiled laundry.
- Add 1 cup of non-chlorine bleach to the wash cycle was and dry as usual.
- Place clean laundry in a clean unused bag do no reuse the old bag.

Exposure Controls

Cleaning of Equipment

- Mops clean on a regular basis and as soon contaminated with blood or OPIM.
  - Soak in disinfectant after use
  - Rinse thoroughly
  - Wash in hot water cycle
- Place disposable cleaning equipment in plastic bag before putting in trash.
- Flush water used to clean up regulated waste in toilet not in a sink.
- Clean and decontaminate non-disposable cleaning equipment on a regular basis and as soon contaminated with blood or OPIM.

Employee Exposure Incident

Exposure incident means that an employee, in performing his/her duties, is exposed to another person's blood or other potentially infectious fluid though direct contact with the employee's eyes, mouth, other mucus membrane, or break in the skin.

Steps to Take for an Exposure Incident

- Wash or flush exposed area(s) immediately.
  - Skin surfaces: Wash with soap and running water for 5 minutes until thoroughly cleansed.
  - Eyes/other mucus membranes: Flush thoroughly with tepid tap water for 5 minutes.
- Report immediately to building administrator and building nurse or District Health Specialist. During non-school hours report immediately to direct supervisor.

Steps to Take for an Exposure Incident
cont.

- Refer to Bloodborne Pathogen Compliance Plan
  - Workdays call Health Force Occupational Medicine at (425) 259-0300 .
  - Weekends call the Colby or Pacific Campus Emergency Room at (425) 261-2000.
- Post-exposure medical evaluation and follow-up will be provided at district expense if indicated.

Hepatitis B Vaccine

- **First Anti-cancer Vaccine**
- Hepatitis B vaccine prevents hepatitis B disease and its serious consequences like hepatocellular carcinoma (liver cancer). Therefore, this is the first anti-cancer vaccine.
- **Safe and Effective**
- Medical, scientific and public health communities strongly endorse using hepatitis B vaccine as a safe and effective way to prevent disease and death.
- Scientific data show that hepatitis B vaccines are very safe for infants, children, and adults.
- There is **no confirmed evidence** which indicates that hepatitis B vaccine can cause chronic illnesses.
- To assure a high standard of safety with vaccines, several federal agencies continually assess and research possible or potential health effects that could be associated with vaccines.

Hepatitis B Vaccine

If you would like to receive the vaccine and contact your school nurse

Thank you for taking the time to learn about safety and health and how to prevent future injuries and illnesses.