Rutherford County Safety

Bloodborne Pathogens Training

Course Objectives

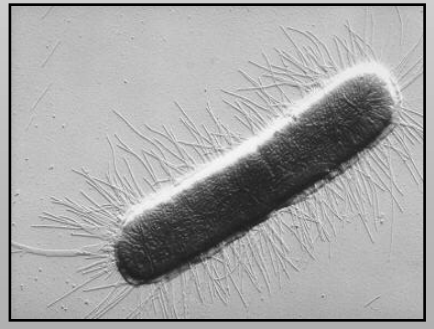
- What are Bloodborne Pathogens (BBPs)?
- Why are they harmful?
- How can I protect myself?
- What is an Exposure Control Plan?

General overview

PATHOGEN: a microorganism that can cause disease

Examples of Illnesses Pathogens Cause

- Viruses — AIDS, Hepatitis B, colds, flu, Herpes
- Bacteria — Intestinal diseases, Tuberculosis, Gonorrhea
- Fungi — Athlete's foot, Farmer's lung, Asthma/allergies
- Parasites — Giardiasis, Malaria, Trichinosis



E. coli (bacteria)

Trichinella (parasite)

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Transmission of Diseases

Organisms can enter the body via

- **Inhalation**

  Air

- **Ingestion**

  Contaminated food, water

- **Contact**

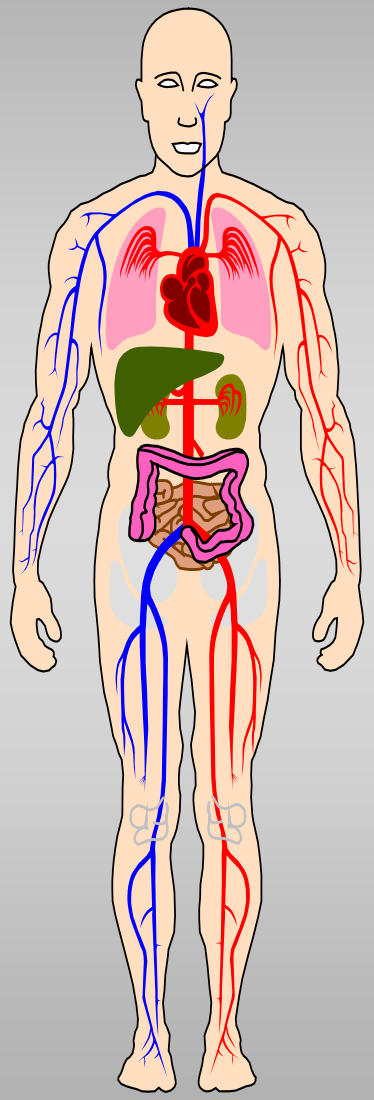
  Bloodborne

Bloodborne Pathogens (BBPs)

Present in

Blood

or

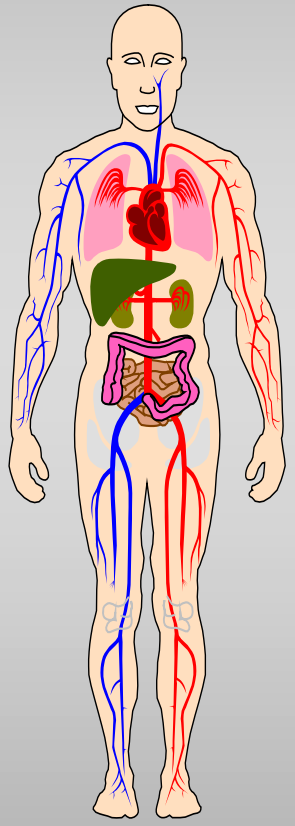


Other
Potentially
Infectious
Materials

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 body fluids visibly contaminated with blood



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

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

Main bloodborne pathogens and diseases of concern

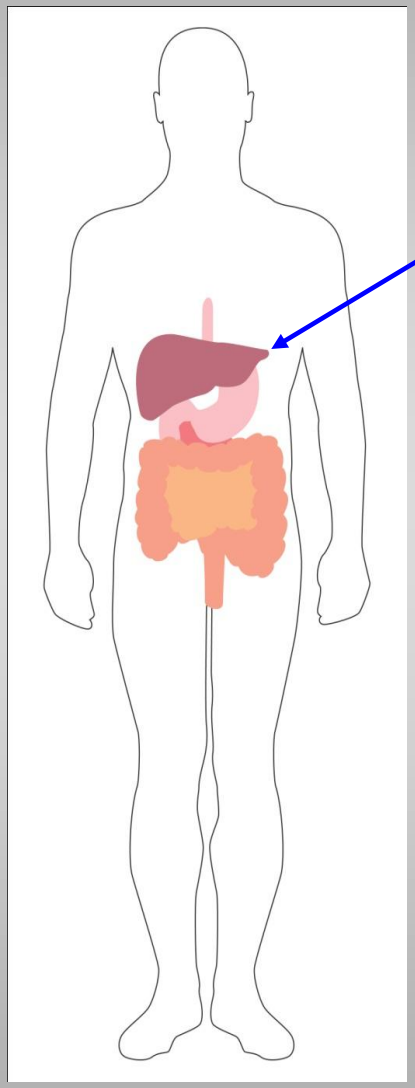
- **Hepatitis B Virus (HBV)** **–Hepatitis B**
- **Hepatitis C Virus (HCV)** **–Hepatitis C**
- **Human Immunodeficiency Virus (HIV)** **–AIDS**

Some examples of bloodborne pathogens:

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

Viral Hepatitis -General Overview

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

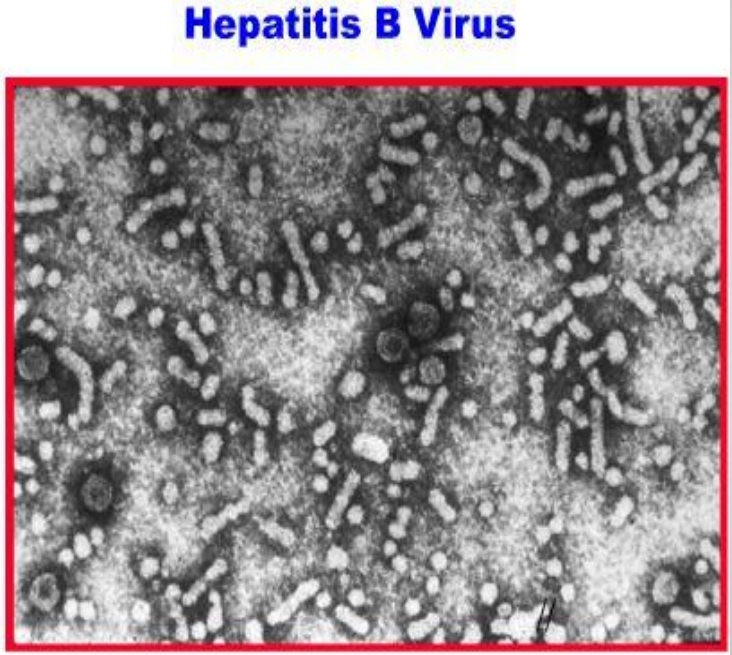


The liver is a large, dark red gland located in the upper right abdomen behind the lower ribs. It functions in removing toxins (poisons) from the blood, in the digestion of fats, and in other body processes.

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
- 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 Acute illness (jaundice)	30% 30%-50% (≥5 years old)
Chronic infection (carrier)	2%-10% (of infected adults)
Premature death from chronic liver disease	15-25% (of chronically infected)
Inmunity	Protected from future infection

HBV – Hepatitis B

Symptons

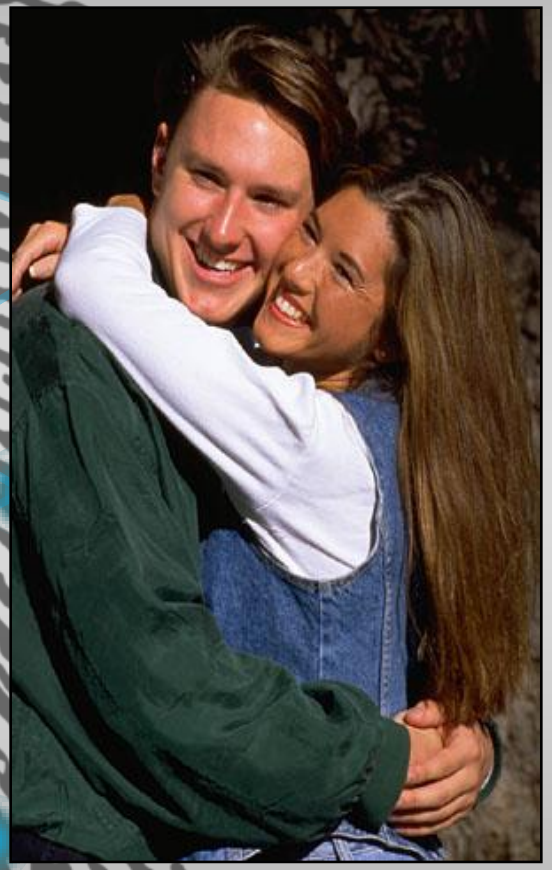
- flu-like symptoms
- fatigue
- abdominal pain
- loss of appetite
- nausea, vomiting
- joint pain
- jaundice

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

HCB – Hepatitis C

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.

Healthy human liver

Hepatitis C liver

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General Facts

- The most common chronic bloodborne infection in the U.S.
- 3.9 million (1.8%) Americans infected; 2.7 million chronically infected
- 25,000 new infections per year (2001)
- Leading cause of liver transplantation in U.S.
- 8,000-10,000 deaths from chronic disease/year
- No broadly effective treatment
- No vaccine available

HCV – Hepatitis C

Clinical Features

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

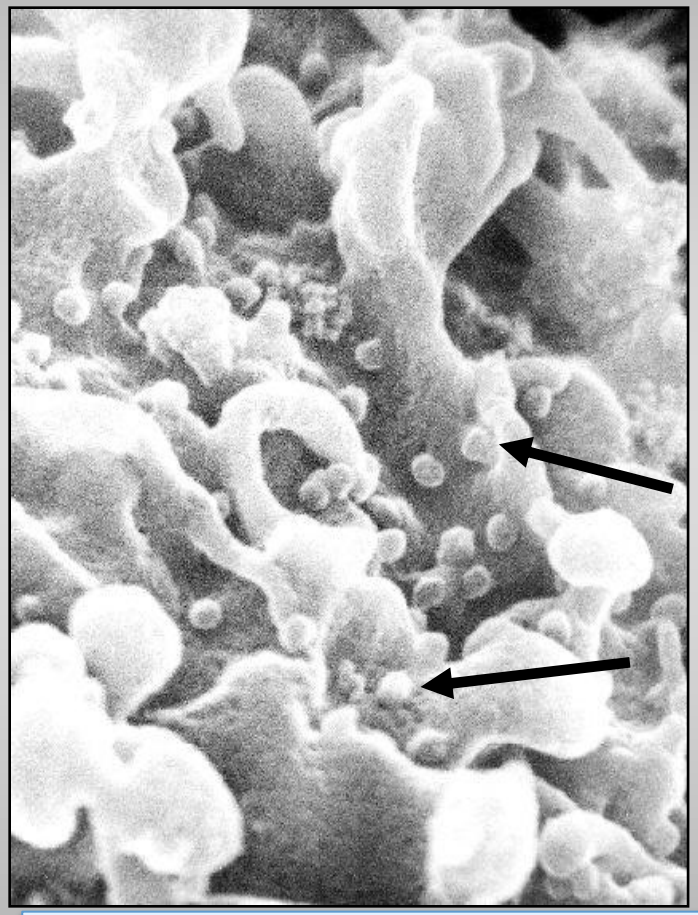
HCV Transmission

- 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
- >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

Transmission of BBPs

Occupational Exposure

- means reasonably anticipatedskin, 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

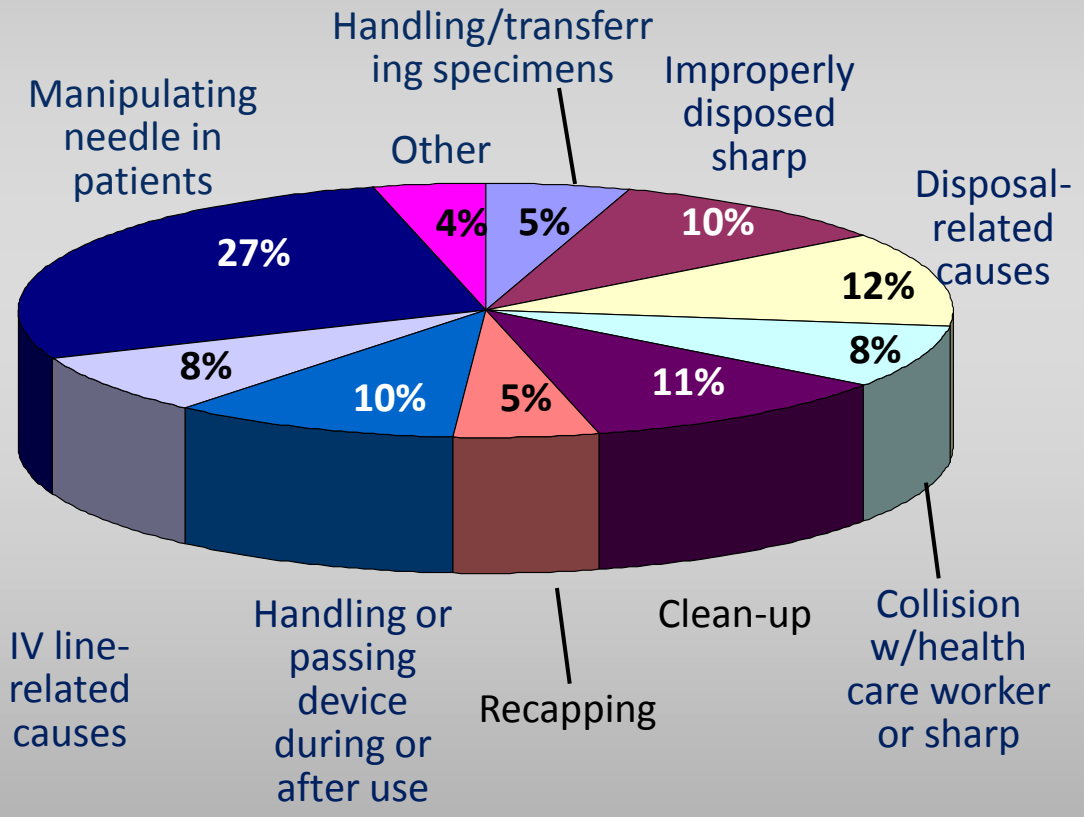
is a specificcontact with blood or OPIM that is capable of transmitting a bloodborne disease

Health Care Workers and BBPs

Occupational Transmission

- Most common: needlesticks
- Cuts from other contaminated sharps (scalpels, broken glass, etc.)
- Contact of mucous membranes (eye, nose, mouth) or broken (cut or abraded) skin with contaminated blood

Causes of percutaneous injuries with hollow-bore needles, by % total percutaneous injuries



Health Care Workers and BBPs

Occupational Transmission

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

- HBV: 6%-30%
- HCV: 1.8%
  (range 0%-7%)
- HIV: 0.3%

Exposure Control Plan

To eliminate/minimize your risk of exposure

- **Exposure determination**
- **Exposure controls**
- **Training and Hazard Communication**
- **Hepatitis B Vaccine**
- **Post exposure evaluation & follow-up**
- **Recordkeeping**

location…

Exposure Determination

Who is at risk on-the-job?

In which job classifications here are ...

- All employees occupationally exposed?
- Some employees occupationally exposed?

What are the tasks with exposure?

Determine exposure without considering the use of PPE.

Exposure Determination

The following are job classifications in our establishment in which **ALL employees have occupational exposure to bloodborne pathogens:**

Job Title	Department/Location
(example: Phlebotomist)	*(example: Clinical Lab)*

The following are job classifications in our establishment in which **SOME employees have occupational exposure to bloodborne pathogens:**

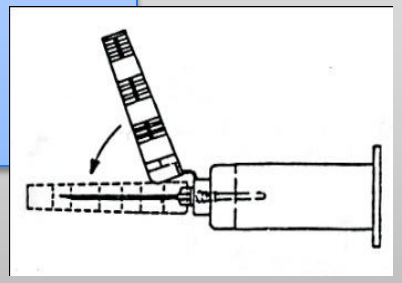
Job Title	Department/Location	Task/Procedure
(example: housekeeper)	*(Environmental services)*	*(Handling Regulated Waste)*

Exposure Controls

Reducing your risk

- Universal precautions *(or equivalent system*)*
- Equipment and Safer Medical Devices
- Work practices
- Personal protective equipment

- Housekeeping
- Laundry handling
- Hazard communication-labeling
- Regulated Waste



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 Controls

Equipment and Safer Medical Devices

Physical guard

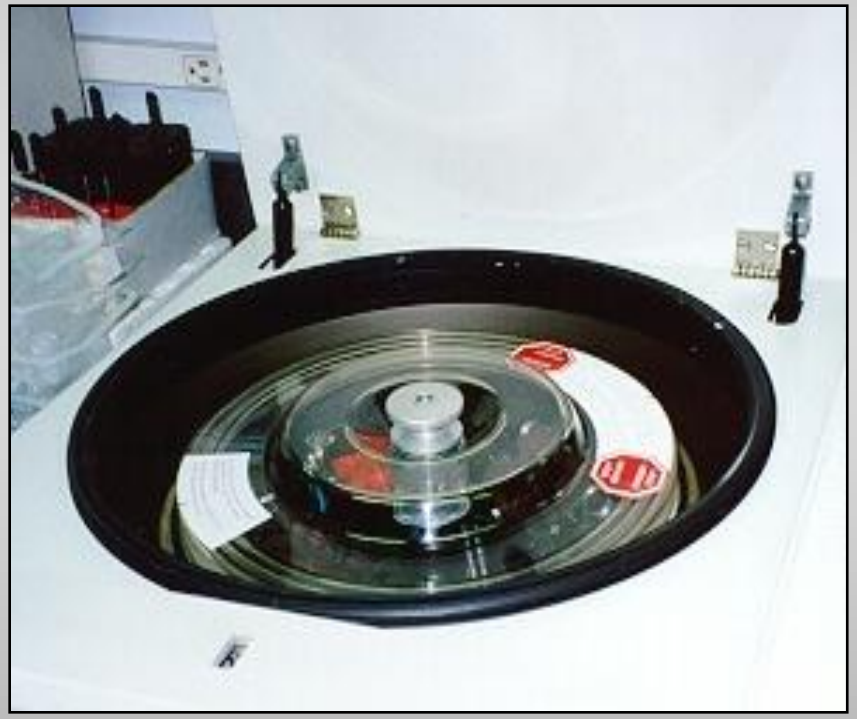
Sharps disposal containers

- -Closable
- -Puncture-resistant
- -Leak-proof
- -Labeled or color-coded
- -Upright, conveniently placed in area where sharps used
- -DO NOT OVERFILL!

Exposure Controls

Equipment and Safer Medical Devices

- Barrier Shields



Exposure Controls

Equipment and Safer Medical Devices

- Environmental Controls
  - Ventilation Hood

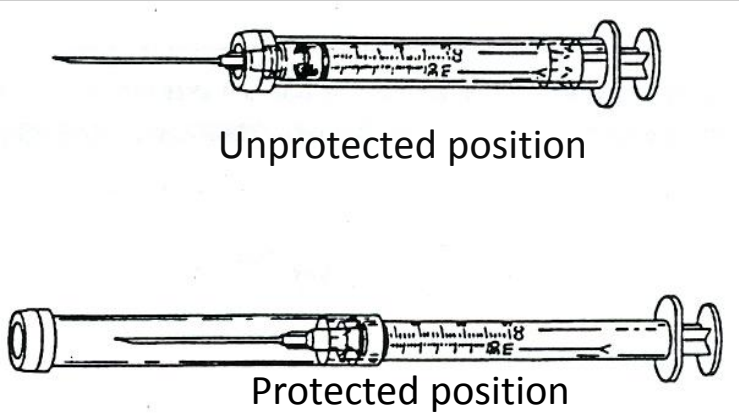
Exposure Controls

Equipment and Safer Medical Devices

- Other Devices

Safer Medical Devices

- Sharps with engineered sharps injury protections (SESIP)
- Needleless systems
- Self-blunting needles
- Plastic capillary tubes



Example of needle guard with protected sliding sheath that is pushed forward after use and locks (with some designs the shield must be twisted to engage the lock).

Exposure Controls

Safe Work Practices

Do the job/task in safer ways to minimize any exposure to blood or OPIM:

- Don’t bend, recap, or remove needles or other sharps
- Don’t shear or break needles
- Place contaminated reusable sharps immediately in appropriate containers until properly decontaminated

Exposure Controls

Safe Work Practices

- Do not pipette or suction blood or OPIM by mouth.
- Wash hands after each glove use and immediately or ASAP after exposure.
- Remove PPE before leaving work area.

Exposure Controls

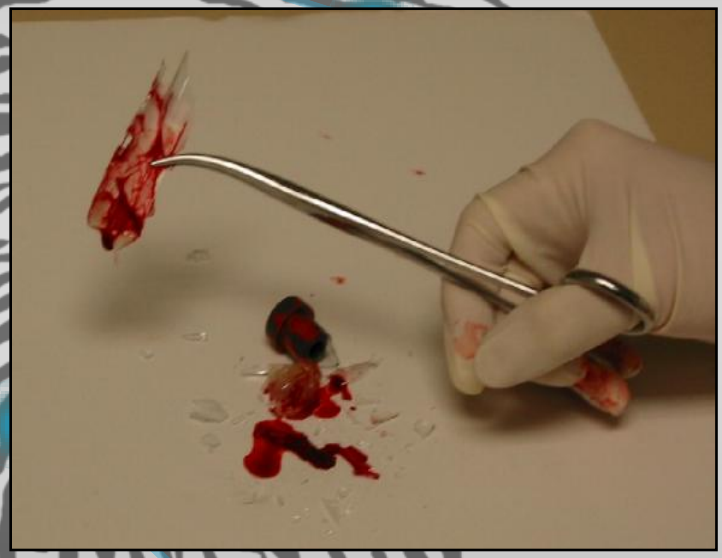
Safe Work Practices

- 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

Safe Work Practices

Clean-up of spills and broken glassware/sharps contaminated with blood or OPIM



✓ Wear protective eyewear and mask if splashing is anticipated.

✓ Remove glass and other sharps materials using a brush and dust pan, forceps, hemostat, etc. **Do not use your hands.**

✓ Properly discard all materials into a sharps or puncture-resistant biohazardous waste container.

✓ Use paper/absorbent towels to soak up the spilled materials.

Exposure Controls

Safe Work Practices

Clean-up of spills and broken glassware/sharps (cont.)

- Clean the area with 10% bleach orEPA-registered disinfectant.
- Saturate the spill area with disinfectant. Leave for 10 minutes (or as specified by product manufacturer) or allow to air dry.
- Properly dispose of paper towels and cleaning materials into proper waste containers.

Exposure Controls

Personal Protective Equipment (PPE)

You must wear all required PPE. *The County provides you with the following PPE at no cost:*

- Gloves
- Lab coats
- Gowns
- Shoe covers

- Face shields or Masks and eye protection
- Resuscitation devices

Disposable PPE Can Not Be Reused

Exposure Controls

Personal Protective Equipment (PPE)

Nitrile and vinyl gloves

Gloves

- Latex
- Nitrile
- Vinyl
- Utility

Boxes of latex gloves
in glove dispensing rack

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

Personal Protective Equipment (PPE)

Protective clothing

-Lab coat

-Gown

-Apron

-Surgical cap or hood

-Shoe cover or boot

-Fully encapsulated suit

Exposure Controls

Personal Protective Equipment (PPE)

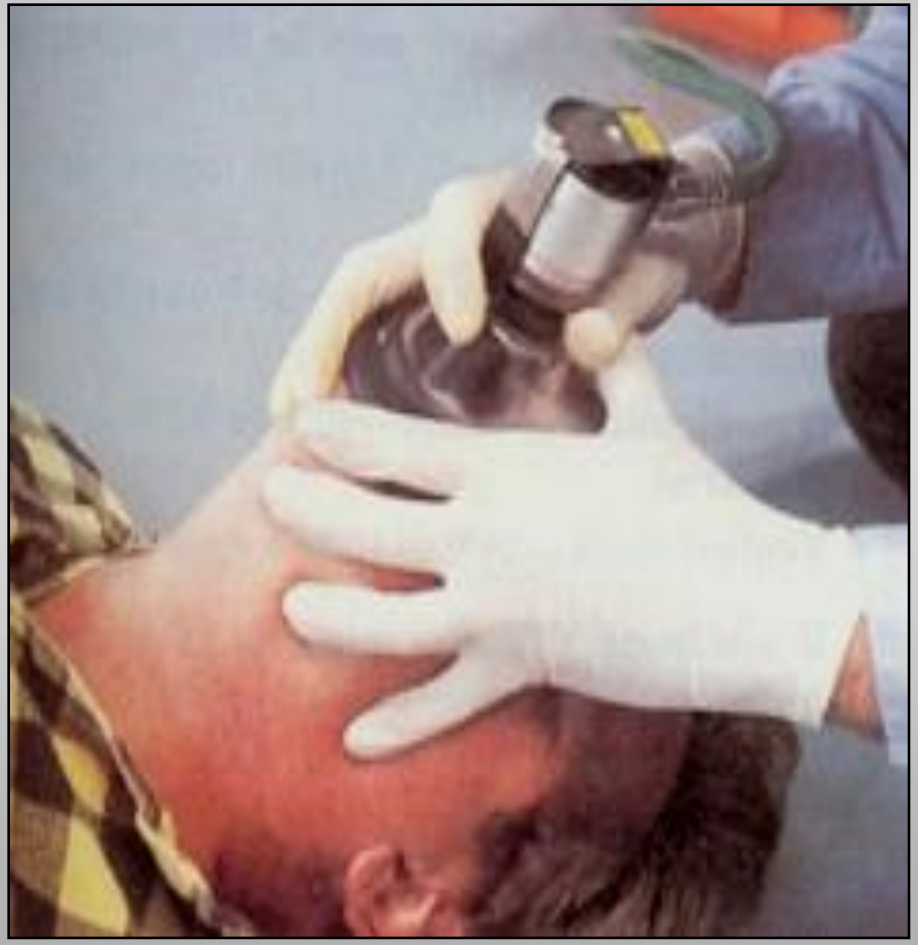
Eye-Face Protection and Masks

- Safety glasses with side shields
- Splash goggles
- Face shield
- Mask

Exposure Controls

Personal Protective Equipment (PPE)

Resuscitation Devices



Exposure Controls

Housekeeping

Maintain a clean and sanitary workplace

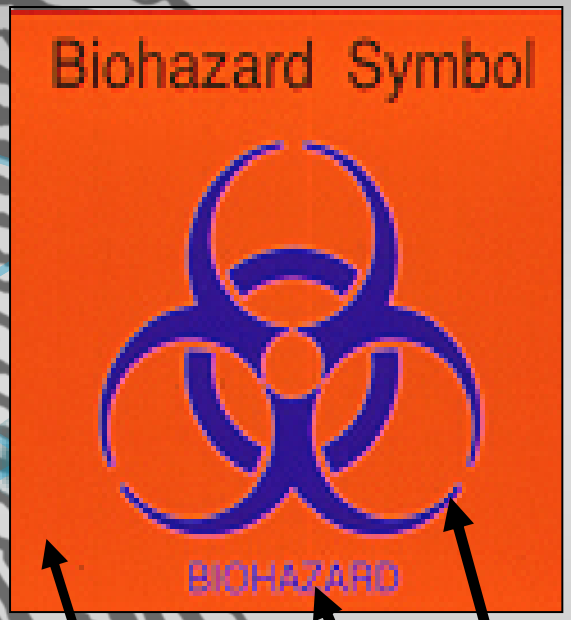
- Written cleaning and decontamination schedule and procedures
- Approved disinfectant –bleach, EPA-approved
- Contaminated waste disposal methods
- Laundry

Exposure Controls
Laundry

- Contaminated articles: *(list items that are laundered)*
- Handle as little as possible
  - Bag/containerize where used
  - Don't sort or rinse where used
  - Place in leak-proof, labeled or color-coded containers or bags
- Wear PPE when handling and/or sorting:
  - Gloves
  - Gown
- Schedule *(Time, location)*

Exposure Controls

Communication of Hazards



Predominantly fluorescent orange or orange/red background

Lettering and symbol in contrasting color to background

Biohazard Labels and Signs

- Must have biohazard symbol
- Labels attached securely to any containers or items containing blood/OPIM
- Red bags/containers may substitute for labels
- Signs posted at entrance to specified work areas

Exposure Controls

Regulated Waste

- Liquid or semi-liquid blood or OPIM
- Contaminated items that would release blood or OPIM in a liquid or semi-liquid state if compressed
- Items caked with dried blood or OPIM that are capable of releasing these materials during handling
- Contaminated sharps
- Pathological and microbiological wastes containing blood or OPIM

Exposure Controls

Regulated Waste -Containers

- Easily accessible
- Labeled or color-coded
- Leak-proof, closeable
- Puncture-resistant for sharps
- Replaced routinely (do no overfill!)

Exposure Controls

Regulated Waste -Containers

- Close immediately before removing or replacing
- Place in second container if leaking possible or if outside contamination of primary container occurs
- If reusable, open, empty, and clean it in a manner that will not expose you and other employees

Hepatitis B Vaccine

- No cost to you
- 3 shots: 0, 1, & 6 months
- Effective for 95% of adults
- Post-vaccination testing for high risk HCW
- Post-exposure treatment (if not vaccinated)
  - –Immune globulin
  - –Begin vaccination series
- If decline, must sign Declination Form
  - –vaccine available at later date if desired

Exposure Incident

If you have an exposure incident to blood or OPIM, immediately do the following:

- Thoroughly clean the affected area
  - Wash needlesticks, cuts, and skin with soap and water
  - Flush with water splashes to the nose and mouth
  - Irrigate eyes with clean water, saline, or sterile irrigants

- Report exposure to *(supervisor, person or department responsible for managing exposures, etc.); fill out an Incident Report Form*

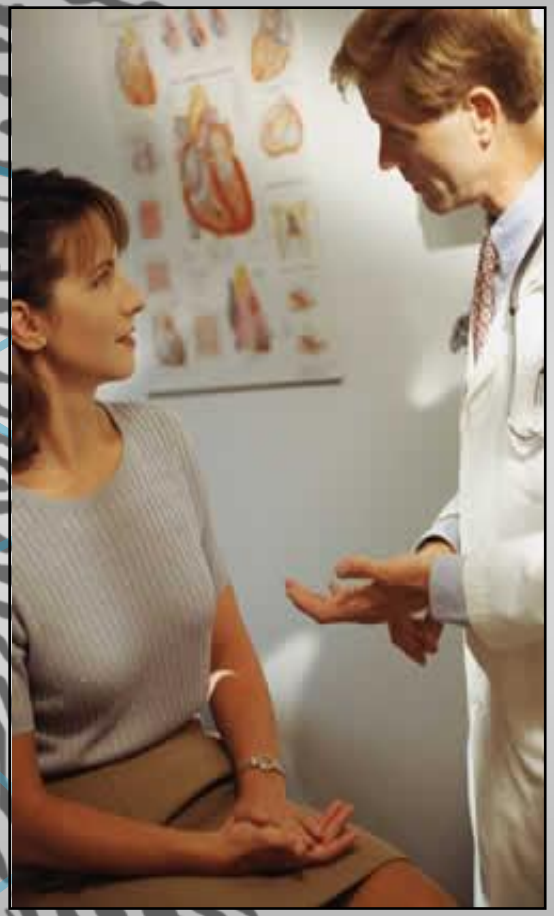
Post-exposure evaluation

Employer's Responsibility:

- ✓Provide immediate post-exposure medical evaluation and follow-up to exposed employee:
  - ✓At no cost
  - ✓Confidential
  - ✓Testing for HBV, HCV, HIV
  - ✓Preventive treatment when indicated
- ✓Test blood of source person if HBV/HCV/HIV status unknown, if possible; provide results to exposed employee, if possible

Post-exposure evaluation

Employer's Responsibility: (cont.)



- Provide exposed employee with copy of the evaluating health care professional's (HCP)written opinion within 15 days of completion of evaluation
- Provide employee with information about laws on confidentiality for the source individual
- Provide post-exposure treatment as needed, including counseling

Recordkeeping

Medical Records

- **Confidential**
- **Hepatitis B vaccination and post-exposure evaluations**
- **HCP's written opinions**
- **Information provided to HCP as required**
- **Maintain for length of employment + 30 years**

Recordkeeping
Training Records

- Dates
- Content summary
- Attendee’s names & job titles
- Maintain for 3 years

Quiz

Click on the link below to take a 5-Question Quiz.

https://secure.rutherfordcountytn.gov/bbp/

Once you have linked to the quiz, please enter your Social Security Number at the top. You will need to enter it according to the example shown (ex. 999-99-9999 with hyphens included).

Once finished with the questions, please click the submit button and your training will be recorded.

Note: It takes 90 days for newly hired employees to be loaded to the training database. In this case print out the quiz and submit to your supervisor or safety training point of contact.