CURRENT AS OF: January 2023

Bloodborne Pathogens

Oklahoma State University

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Objectives

- What is a Bloodborne Pathogen (BBP)?
- Who is at risk?
- Modes of transmission.
- What are your employer's responsibilities?
- What is an exposure control plan?
- How do I prevent or reduce exposure or the spread of BBPs.
- Types of PPE, proper use, and disposal.
- Emergency actions following possible exposure.

Who is at risk? Could you be exposed at work?

- First responders
- Law enforcement
- Laboratory personnel
- Housekeeping personnel
- Facilities personnel
- Nurses and doctors
- Other healthcare personnel

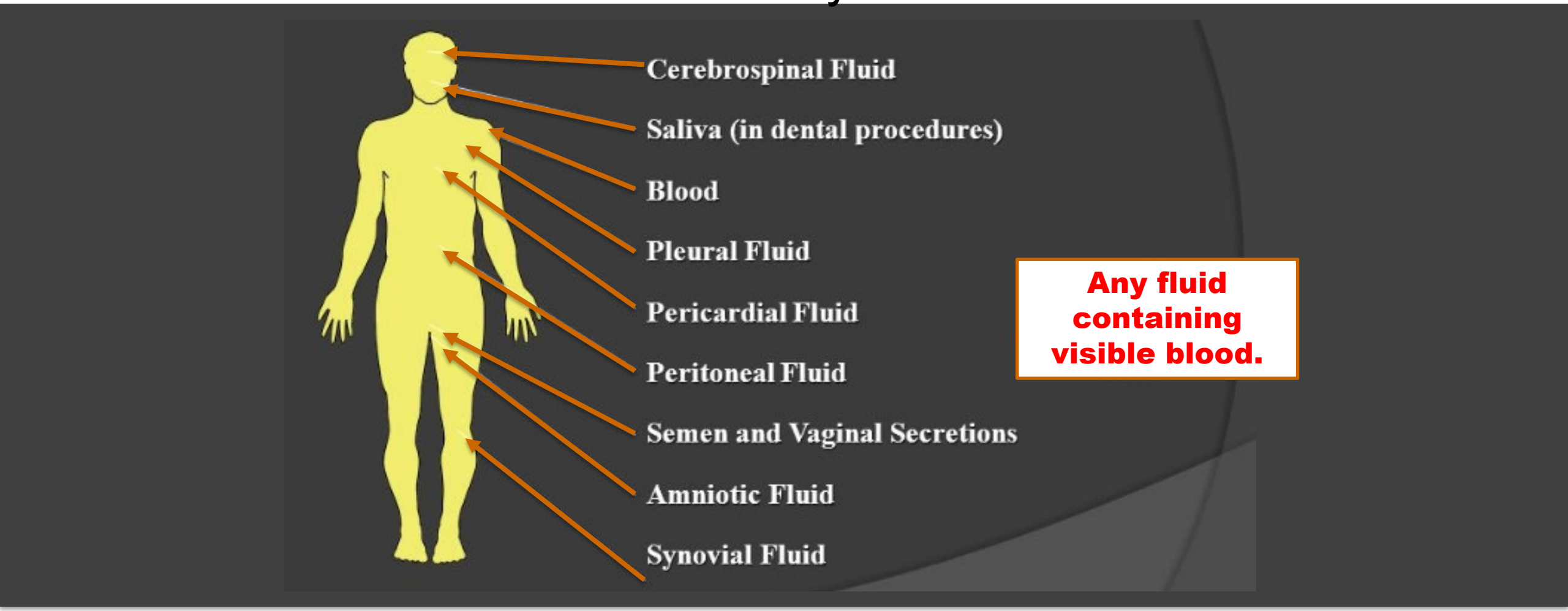
OSHA 29CFR 1910.1030

- In March 1992, OSHA's Bloodborne Pathogen Standard, 29 CFR 1910.1030 took effect. It was last updated in 2001.
- This standard was designed to prevent more than 200 deaths and 9,000 Bloodborne infections every year.
- Requires employers to identify employees who may be at risk of occupational exposure to BBP as part of their job, and develop methods and controls to eliminate or reduce workplace exposure to BBP.

What is a BBP, and why are they important?

- Microorganisms that are carried in blood that can cause disease in humans.
- These pathogens include, but are not limited to:
  - Hepatitis B
  - Hepatitis C
  - HIV
- OSHA estimates 5.6 million workers in health care and other facilities are at risk of exposure to bloodborne pathogens.
- Bloodborne pathogens can be transmitted through blood or ‘other potentially infectious material’ ***(OPIM)***.

What are “Other Potentially Infectious Materials?



Universal Precautions

Treat all blood, body fluids, secretions, excretions (except sweat), non-intact skin, and mucous membranes as if they contain transmissible infectious agents.

Also make sure to:

- Use good hand hygiene
- Use gloves, gowns, masks, eye protection, and/or face shields depending on the anticipated exposure
- Use safe injection practices

Could you contract a bloodborne pathogen doing these things?

- Administering first-aid?
- Cleaning the restroom?
- Using a tool covered with dried blood?
- Cleaning up after an accident?
- Cutting yourself with something that is contaminated with blood?

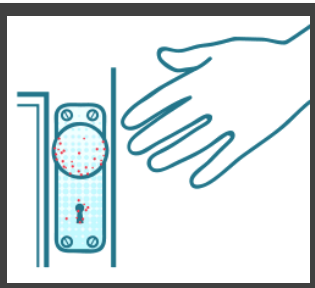
Modes of Transmission

Direct

Physical contact between an infected person and a susceptible person.

- Touching an infected individual
- Sexual contact
- Contact with oral secretions
- Contact with body lesions.

Indirect



- Person is infected from contact with a contaminated surface.
- Some organisms are capable of surviving on surfaces for an extended period of time.
- To reduce chance of transmission by indirect contact, regularly clean surfaces that are touched a lot.

Modes of Transmission

- It is important to be aware of the ways exposure and transmission are most likely to occur for your work situation.
  - A puncture or cut from contaminated sharps is the most common way employees are infected by BBP in the workplace.

- Unbroken skin provides a resistant barrier to bloodborne pathogens. However, infected blood can enter your system through:
  - Open sores or cuts
  - Abrasions
  - Acne
  - Damaged or broken skin (e.g. sunburn or blisters)

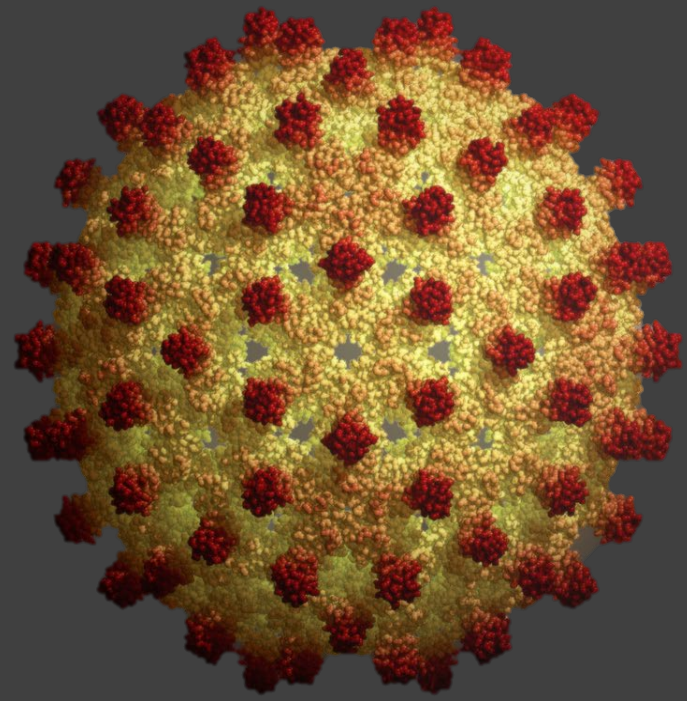
Modes of Transmission

You CAN be exposed from	You CANNOT be exposed from
Blood-to-blood contact	Mosquitoes
Blood and OPIM contact with non-intact skin (cuts, abrasions)	Air or water
Contaminated sharps penetrating skin	Tears
Blood and OPIM contact with eyes	Sweat or urine
Blood and OPIM contact with mucous membranes of the mouth and nose	Saliva, as long as there is no blood present

Review Video

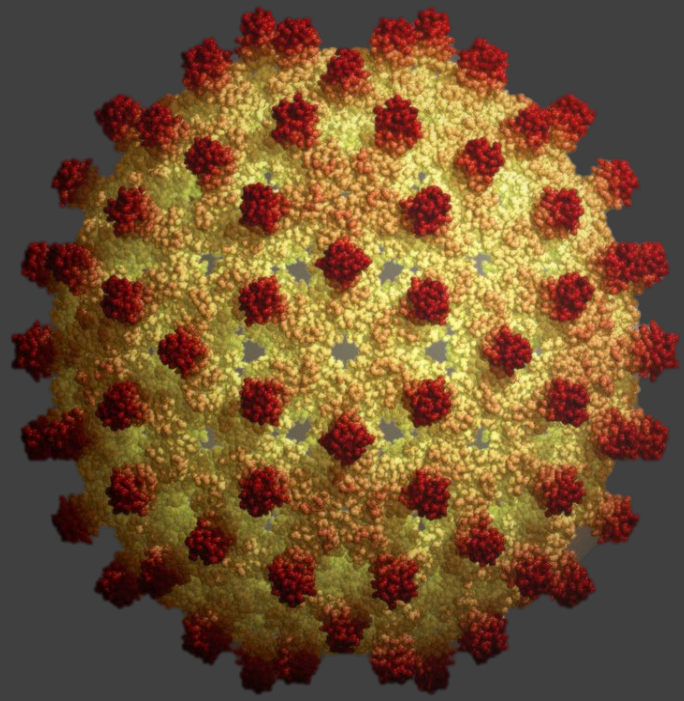
Hepatitis B (HBV)

- An infection of the liver that can cause scarring, liver failure, and liver cancer; and is potentially life-threatening.
- Usually an acute infection, but 5% to 10% of adults and children older than 5 who have HBV end up with a chronic infection. There is a vaccination available!
  - If you are exposed to HBV the vaccine is effective at preventing the disease if administered within 24 hours of exposure.
- As many as 867,000 people in the U.S. are estimated to be living with HBV.

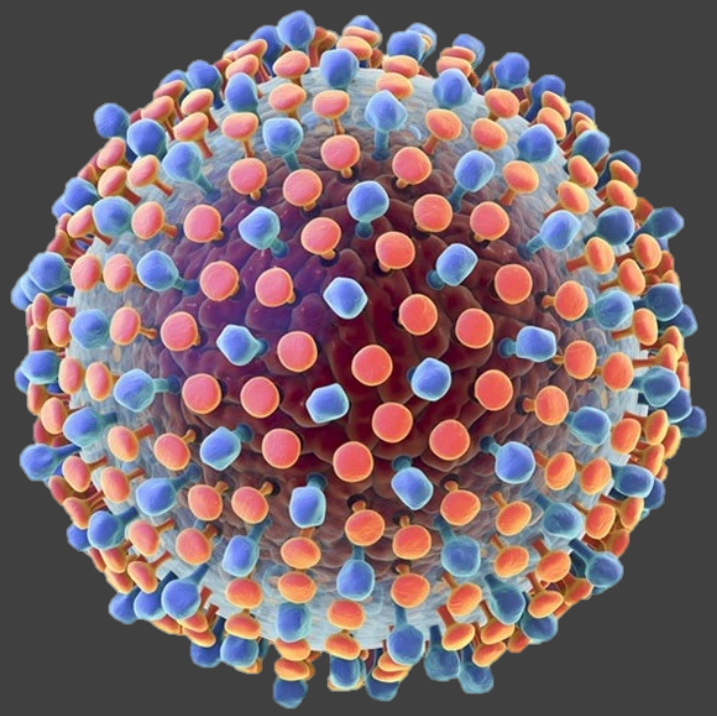


Hepatitis B (HBV)

- Infection rates have dropped from 200,000 in the ‘80s to 20,000 in 2016.
- HBV can survive for at least one week in dried blood.
- Symptoms, such as jaundice, fever, fatigue, abdominal pain, nausea, and vomiting and can occur 60 to 150 days post-exposure (avg. of 90 days).
  - Some people exposed to HBV do not develop symptoms
  - 67% of people living with HBV do not know they have the virus but are lifelong carries who still transmit the disease.

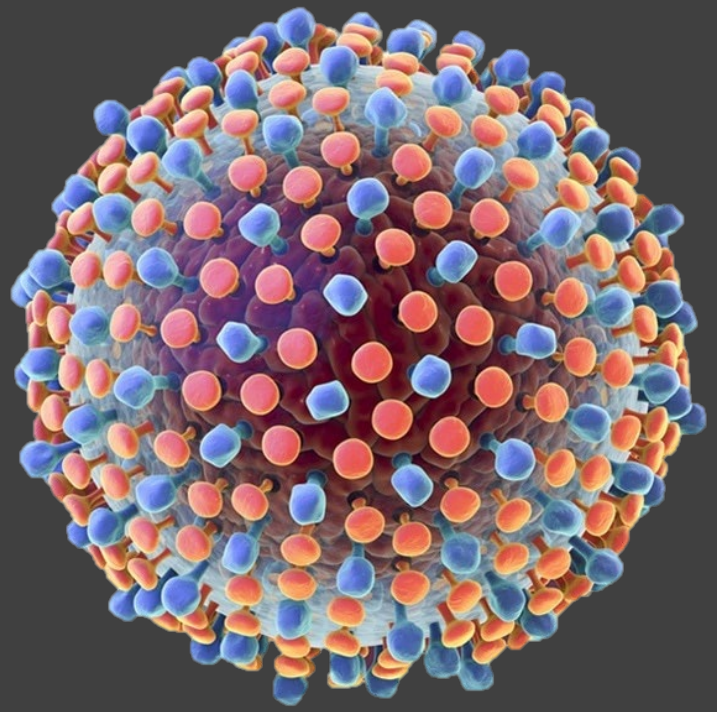


Hepatitis C (HCV)



- HCV is a contagious liver disease that affects about 2.5 to 4.7 million people in the U.S.
- Can range from mild illness lasting a few weeks to a serious, lifelong illness. About 75% to 85% of people infected with HCV develop a chronic infection.
- HCV can live up to 3 weeks outside the body, but only at room temperature on clinical or household surfaces like a drawer handle or sink.

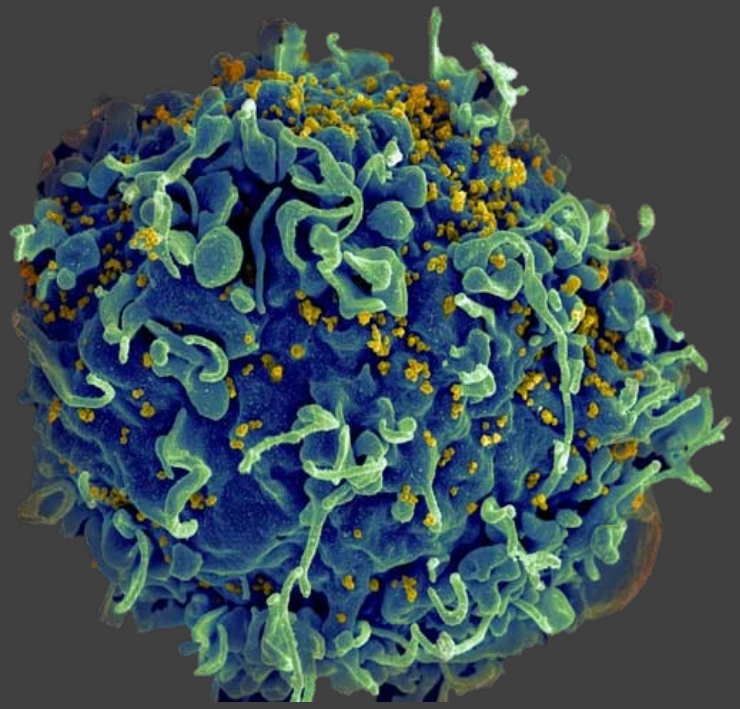
Hepatitis C (HCV)



- Symptoms include: fever, fatigue, abdominal pain, nausea, loss of appetite, weight loss, and jaundice.
- The average time from exposure to symptoms showing is 2 to 12 weeks. However, most people do not develop symptoms.
  - 52% of people living with HCV do not know they have the virus.
- No vaccination available; however HCV protease inhibitors used in combination with other antiviral drugs have over 90% cure rates with a 12-week treatment course.

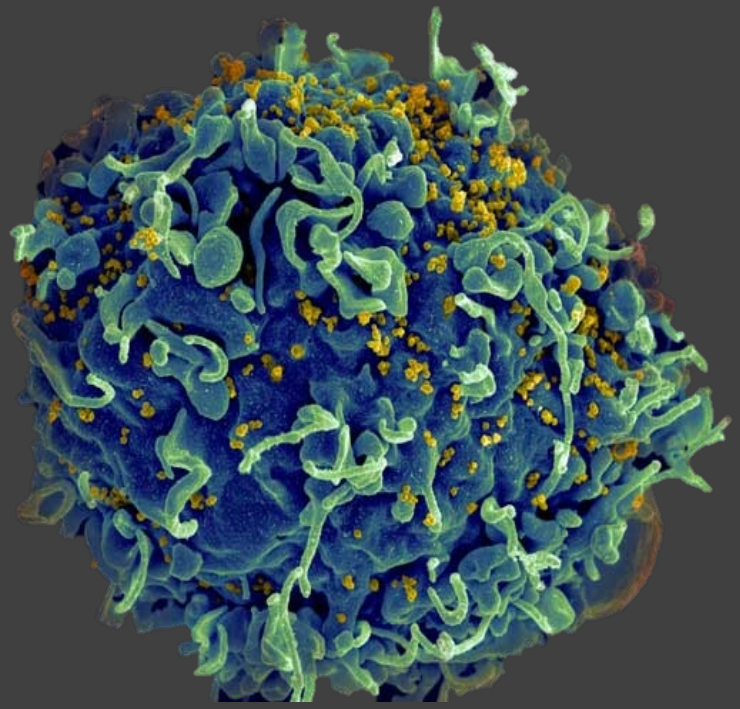
Human Immunodeficiency Virus (HIV)

- HIV is the virus that leads to acquired immunodeficiency syndrome (AIDS).
  - About half of the people infected with HIV develop AIDS within ten years.
- Almost 34,800 people diagnosed in the U.S. in 2019 and 1.2M total living with HIV.
- Depletes the immune system by destroying blood cells that help the body fight diseases.



Human Immunodeficiency Virus (HIV)

- HIV is very fragile and survives less than 24 hours outside the human body. The risk of occupational exposure to HIV is very low.
  - Even though the risk is low, every precaution must be taken to avoid exposure.
- Symptoms include fever, diarrhea, headaches, feeling tired, nausea, and weight loss. They may develop 2 to 4 weeks post-exposure and may last for a few days to several weeks.
  - Approximately 1 in 7 people do not develop symptoms but are still capable of infecting others.
- There is no cure for HIV and it can be fatal, but with proper medical care it can be controlled.



What is the risk of infection following an occupational exposure?

- **HBV**
  - ✓ Personnel who have received hepatitis B vaccine and developed immunity to the virus are at virtually no risk for infection.
  - ✓ For a susceptible person, the risk from an exposure ranges from **6 – 30%.**
- **HCV**
  - ✓ The average risk for infection after exposure is approximately **1.8%.**
- **HIV**
  - ✓ The average risk of HIV after exposure is **0.3%.**

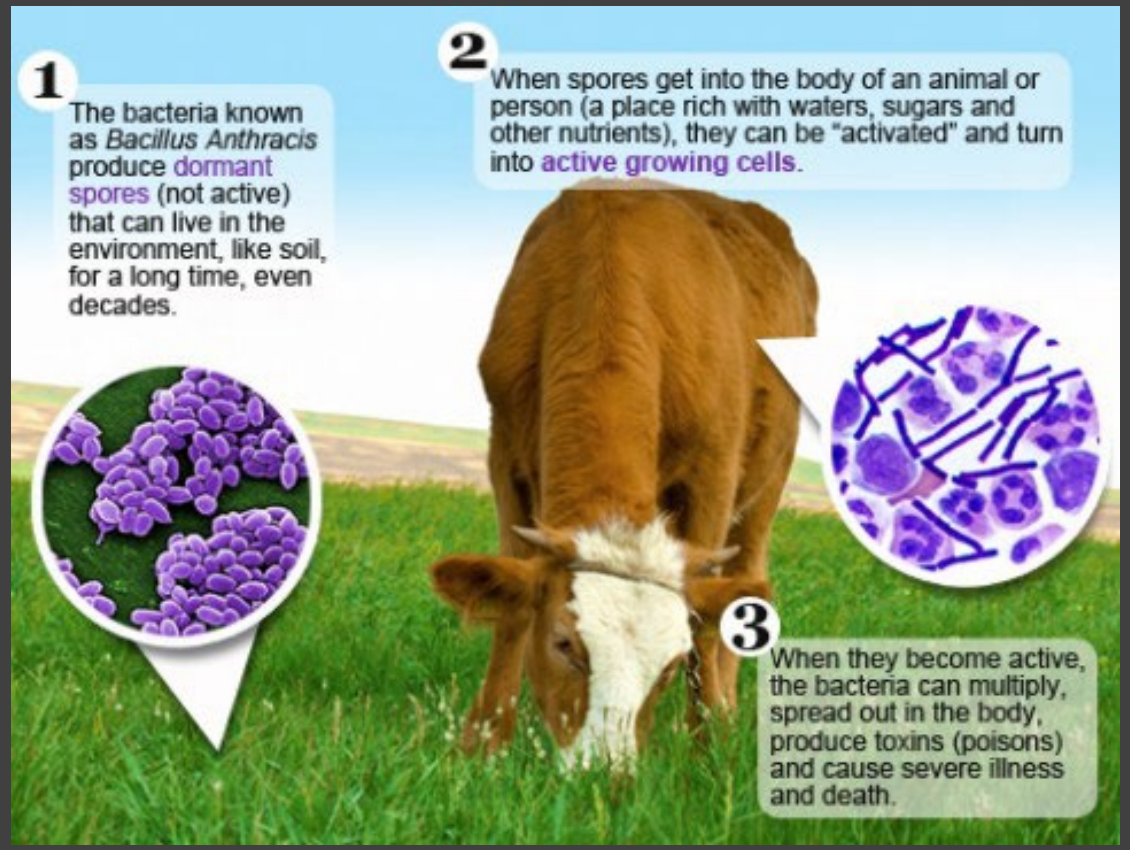
Does 29 CFR 1910.1030 *only* apply to HBV, HCV, and HIV?

No! Here are some other infectious agents that fall under the standard:

Plasmodium species	*Spirillum minus*
Treponema species	Colorado Tick Fever Viruses
Babesia species	*Borrelia* species
Brucella species	Creutzfeldt-Jakob agent
Leptospira species	Human T-lymphotropic Virus Type I
Francisella species	Hemorrhagic Fever Viruses
Streptobacillus moniliformis	*Mycobacterium tuberculosis*
Rabies Virus	Anthrax
Vaccinia	Epstein-Barr Virus
Human Papillomavirus	Simian Vacuolating Virus 40

Cutaneous Anthrax

- Happens when anthrax spores get into the skin.
- Most often from handling infected animals or contaminated animal products like hides and hair.
- Infection develops from 1 to 7 days after exposure.
- Without treatment, up to 20% of people with cutaneous anthrax may die.



Rabies

- All species of mammals are susceptible.
- Transmitted through:
  - Bites
  - Infected blood or saliva gets into an open cut/wound
  - Contamination of mucous membranes
  - Aerosolization
- Incubation period of weeks to months and is fatal once symptoms occur.
- Symptoms include:
  - Weakness
  - Fever
  - Headache

Why does 29 CFR 1910.1030 apply to finite and continuous human cell lines?

- The CDC's Biosafety in Microbiological and Biomedical Laboratories recommends that all work with non-human primate and human cells follows the Bloodborne Pathogen Standard.
- There is extensive testing required to ensure that cell lines are free of all bloodborne pathogens – Not just Viral Hepatitis and HIV (EBV, HTLV, HPV, CMV . . .).
- Establishment of an Exposure Control Plan is much easier than maintaining documentation of testing for OSHA.
- Safety is our number one priority.

Employer Responsibilities

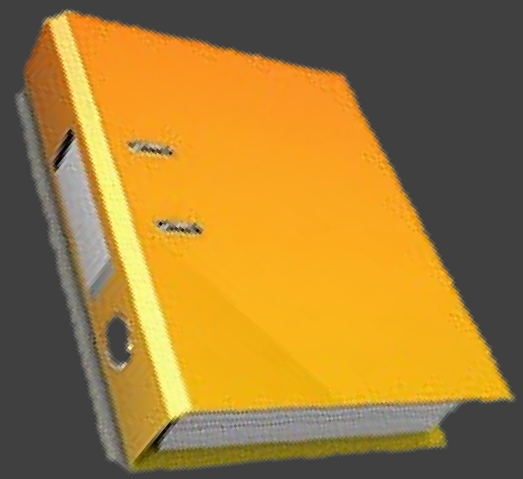
- OSHA's Bloodborne Pathogen Standard states that anyone whose job requires exposure to BBP is required to complete BBP training.
  - Training is conducted face to face, not online
  - Training is required annually
- Anyone whose job requires exposure to BBP is offered vaccines and post exposure evaluation following any possible exposure incidents at no cost to the employee.
- Employer must offer personal protective equipment (PPE) and a written exposure control plan.

Exposure Control Plan

- Plan must be reviewed/updated at least annually, when a process changes, and when a new process is implemented.
- Must be available within your department.
  - EHS can provide current template.
- Address the implementation of ***Universal Precautions*** and the identification and use of engineering controls.
- Provisions for PPE and training.
- Hep B vaccinations available for all employees with occupational exposure.
- Post exposure evaluation and follow-up for any occupational exposure.
- Use of signs and labels to communicate hazards.
- Record keeping.

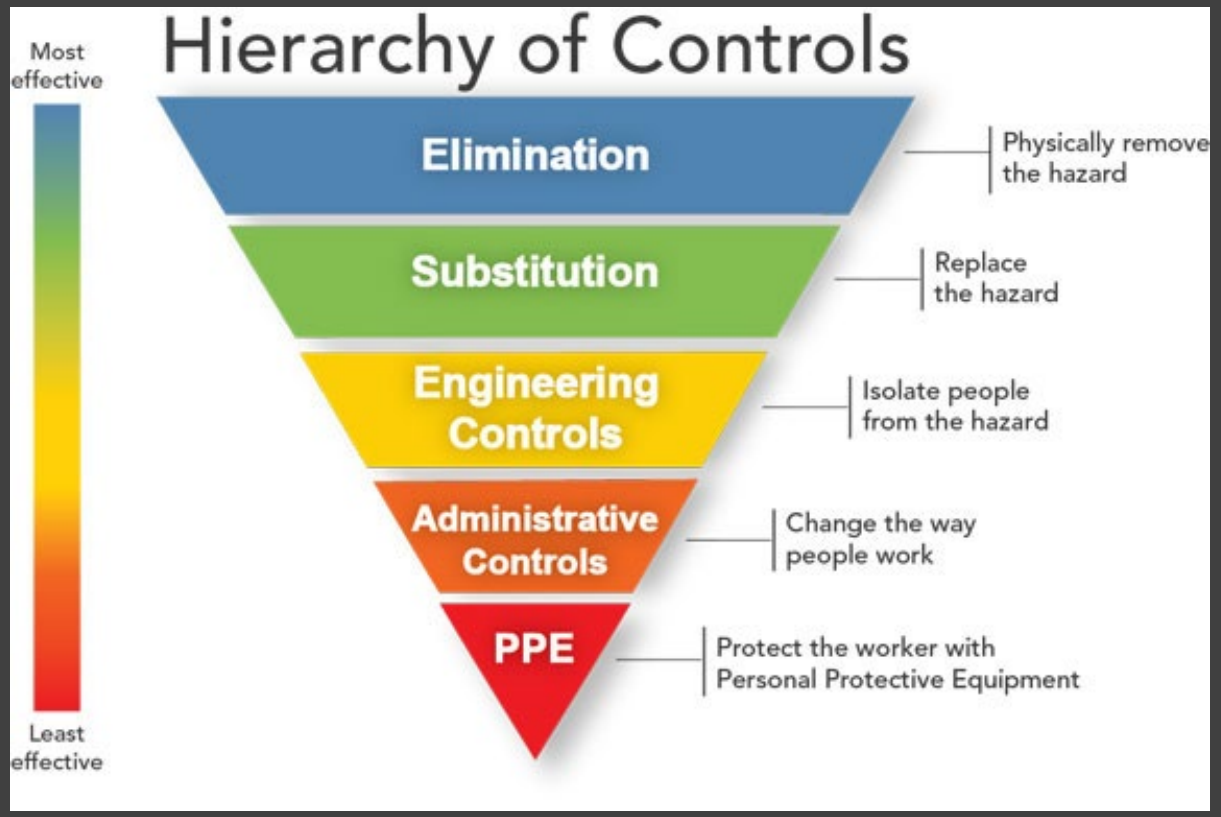
Bloodborne Pathogen Binder

- Suggested binder set up:
  - OSHA Bloodborne Pathogen standard 1910.1030
  - Exposure Control Plan with all appendixes
  - List of all employees under plan
  - Copies of completed/signed Hep B vaccination forms
  - Training documentation
  - Self inspection documentation
  - Completed parameter sheet



- EHS can assist with program set up and may do periodic checks.

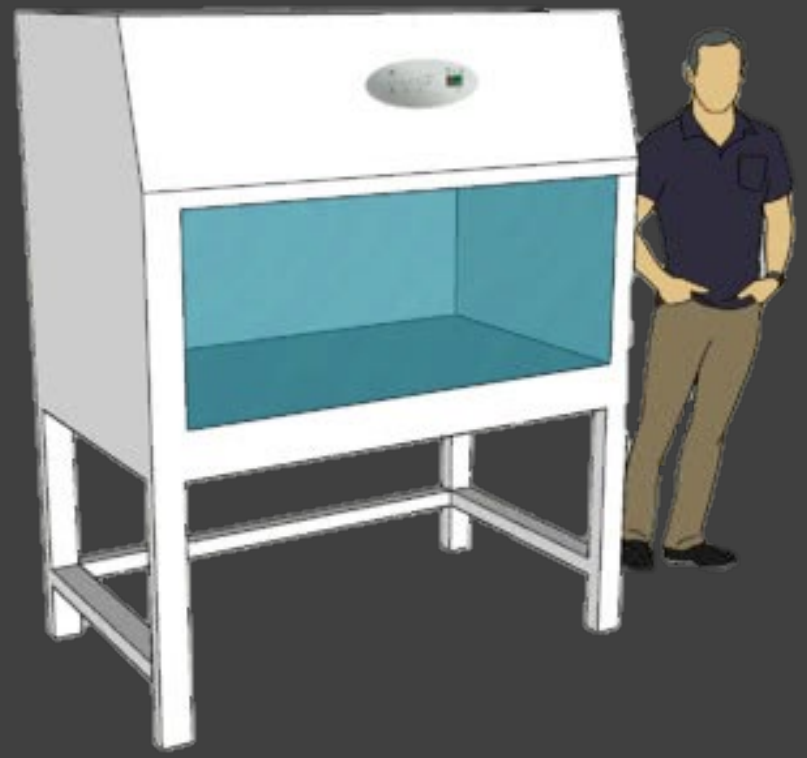
Exposure Prevention



- **Elimination:** Physically remove the hazard.
- **Substitution:** Replace the hazard
- **Engineering Controls:** Isolate workers from the hazard.
- **Administrative Controls:** Change the way people work.
- **PPE:** Protect the worker with personal protective equipment.

Engineering Controls

- Reduce exposure by either removing or isolating the hazard, or isolating the worker from exposure by using devices and advances in technology.
- Must be examined, maintained, and replaced on a regular schedule to ensure their effectiveness.
- Examples: Sharps containers, biohazard waste containers, safer medical devices, needleless systems.



Administrative/Workplace Controls

- Restrict eating, drinking, smoking, applying cosmetics, and handling contact lenses near blood or OPIMs.
- Prevent the storage of food or drink in locations where blood or OPIMs are kept.
- Provide and require the use of handwashing facilities.
- Require the use gloves when working with or cleaning up blood or OPIM spills.
- Prohibit recapping, bending, removing, shearing, or breaking contaminated needles.
- Prohibit picking up sharps or broken glass with bare hands.

Personal Protective Equipment

- PPE must be used if engineering controls and work practice control do not eliminate exposure.
- Employer is required to provide appropriate PPE free of charge and must clean, repair, or replace it as necessary.
- PPE is considered appropriate only if it prevents the passage of blood or OPIM to the employees' work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use.
- PPE can consist of gloves, masks, safety glasses, and respiratory protection.
- PPE selection is based on the task and degree of exposure anticipated.

Proper Use and Handling of PPE

- Wear appropriate gloves when there is a reasonable hazard of contact with infectious materials.
- Replace gloves as soon as possible if they become torn, punctured, contaminated, or compromised; and when moving between patients.
- Disposable (single-use) gloves cannot be washed or decontaminated for reuse.
- Remove contaminated PPE with care.
- Always wash your hands after removing contaminated gloves.
- Wear face and eye protection if risk of splashes, sprays, splatters, or droplets of blood or OPIM are present.

Proper Use and Handling of PPE

- Hands on demonstration

Biohazard Labels

- Warning labels will be affixed to items such as:
  - Containers of regulated waste
  - Containers of contaminated reusable sharps
  - Refrigerators and freezers containing blood or OPIMs
  - Containers used to store, transport, or ship blood or OPIMs
  - Contaminated equipment being shipped or serviced (must state which portion of the equipment is contaminated)
  - Bags or containers of contaminated laundry

Biohazard Labels

- Labels must be fluorescent orange or orange-red, contain the biohazard symbol and the word “biohazard”.
- Labels should be attached to the object by string, wire, adhesive, or another method to prevent loss or unintentional removal.
- Biohazard warning labels are not required by OSHA when red bags or red containers are used, but it is a good work practice to label them anyway to avoid any chance of confusion.

PPE, Contaminates, Sharps, and Waste Disposal

- PPE must be removed before leaving the area of exposure or when it becomes contaminated.
- The containers must be red or clearly labeled as containing biohazardous waste.
- Gloves and other PPE should be disposed of in an appropriate area
- Sharps should be disposed of in sharps a containers that is leak-proof, puncture-resistant, and labeled/color-coded red
- Blood and OPIMs should be disposed of in a closable, leak-proof, and labeled/color-coded container
- Work clothes and equipment that have been in contact with blood or OPIM must always be isolated and decontaminated.

Decontamination

- When cleaning up blood or OPIM:
  - Proper PPE must be worn at all times
  - Cover a spill with paper towels or rags to prevent splashing
  - Pour a solution of 5.25% bleach diluted between 1:10 and 1:100 with water over the towels and let it stand for at least 10 minutes (or as recommended by the manufacturer)
  - An EPA approved virucidal disinfectant may also be used to disinfect and clean up biohazardous material
  - Make sure all material and PPE used to clean and contain a spill are also disinfected or properly disposed of and labeled as biohazardous waste
  - Blood / BBP spill kits are available commercially

Decontamination

- Decontaminate exposed equipment as soon as possible after use.
  - If this is not possible, a readily observable label identifying the contaminated equipment shall be attached to state which portions remain contaminated
- Routinely check equipment and reusable containers/receptacles and decontaminate them prior to using, servicing, or shipping.

What happens after an accidental exposure - Employee

- Wash exposed area with soap and water and complete first aid as necessary
- Report to your supervisor immediately, or as soon as possible after the incident occurs
- Fill out the first section of the Employee Injury Report (EIR) form at the time of the injury
  - Supervisor should fill out the second part of the form at the time of the injury
- NOTE: These instructions are located in section 6 of the ECP template from EHS. Additional instructions are also located at the top of the EIR form. Forms are located on the EHS website.

What happens after an accidental exposure - Employee

- Supervisor should accompany you to the designated medical facility
  - During normal business hours: report to University Health Services
  - Outside normal business hours: report to AMC Urgent Care
- You will receive a confidential medical evaluation
  - With follow up as needed
- With consent, your blood will be taken and tested
  - Results will be shared with you, with appropriate counseling
  - Any treatment prescribed will be made available to you
  - If there is a source individual, they will be identified (if possible)
    - They will also be tested and results will be made known to you

What happens after an accidental exposure - Supervisor

- Assess the situation and determine if the incident is an occupational exposure to a biohazardous substance

- If it is an exposure, locate and fill out the Employee Injury Report form and take the employee to the designated medical facility.
  - If possible, take the completed EIR with you when you to go UHS. If that is not possible, send the employee and fax the form to UHS as soon as possible

- Fill out the Hazardous Substance Employee Exposure Report form and, if applicable, fill out your sharps injury log
  - Sample sharps injury log is located in Appendix D of the ECP template from EHS

- Send a copy of the EIR to Human Resources and EHS (OHSP)

SUBMISSION INFORMATION
Broadspire email: nol@choosebroadspire.com
Workers' Comp email: workerscomp@okstate.edu
Environmental Health Safety: ohsp@okstate.edu

What happens after an accidental exposure - Students

- Wash exposed area with soap and water and complete first aid as necessary
- Report to your supervisor immediately, or as soon as possible after the incident occurs
- Talk to Risk Management for compensation forms if needed.

What happens after an accidental exposure - Forms

What happens after an accidental exposure - Forms

EMPLOYEE INJURY REPORT

INSTRUCTIONS: When a work-related injury occurs, an OSU employee is required to report the injury to his/her supervisor, and must complete the first section of the Employee Injury Report at the time of the injury. The supervisor is required to investigate any work-related injury and complete the second section of the Employee Injury Report at that time of the injury. The supervisor **should** accompany the employee for medical treatment at the designated medical facility (On the **Stillwater campus:** University Health Services during office hours or AMC Urgent Care after hours. **Tulsa/CHS Campus:** Health Care Clinic during office hours or OSU Medical Center after hours. **OKC Campus:** McBride's during office hours or McBride's hospital/nearest E.R. after hours. **OSU-IT Campus:** Once Source Occupational or Concentra Urgent Care**).**

Environmental Health Services or the branch campus safety office is to be notified of the accident by telephone.

TO BE COMPLETED BY EMPLOYEE. **All fields must be completed**
(Please Print Legibly)

Name as on Social Security Card: Last: First: MI:	CWID:	Sex:	Phone Number Home: ( ) Work: ( )	Date of Birth:
Home Mailing Address: Street: City: State: Zip:				
Dept/Unit Name:		Job Title:		
Injury Date: / /		**Time:** □ AM □ PM		
Location of Injury: Room #: Building:				
Body Part Injured: Finger_____Hand_____(Right/Left) Arm__Leg _____(Right/Left) Torso_____Head_____ Other:		Witness Name(s):		
Was injury reported on date it occurred: □ YES □ NO If **NO**, please explain: To Whom Reported: Date/Time Reported: Did you seek medical attention before reporting: □ YES □ NO If **YES**, provide Dr. and explanation: Dr. Name: Address: Phone:				
Describe how and what happened to cause injury: Did Dr. require NO WORK for more than 3 days? □ YES □ NO Has body part been injured before? □ YES □ NO If **yes**, provide date of injury, Dr Name and treatment details:				
Supervisor's Name:	Supervisor's Phone:	Was Supervisor notified: □YES □NO If **NO**, explain:		
Employee Signature:		Date Completed:		

OSU Human Resources 1 revised May 2018

Oklahoma State University
Hazardous Substance Employee Exposure Report

Last Name: First Name: Middle Initial :
Department: Title: CWID:
Date/Time of Exposure: Duration of Exposure:
Location of Exposure (Bldg. & Room #):
Chemical Name(s): Chemical Abstract # (CAS):
Trade and/or Common Name(s) of Chemical(s):
Type of Exposure (e.g. inhalation, ingestion, contact) (If contact, what body part was involved?)
How did exposure occur? (Use additional sheet if necessary):
Was personal protection equipment (PPE) available? Yes ○ No ○
Was personal protection equipment (PPE) used? Yes ○ No ○
If PPE was used, what type(s)?
What training/instructions was provided prior to exposure?
Were any symptoms present at time of exposure? Yes ○ No ○
If so, describe:
Severity of Exposure: First Aid ○ Medical Treatment ○ Unknown ○
Describe:
(Attach Physician's Report, Employee Injury Report, Sharps Injury Log if applicable)
Lost time from work? Yes ○ No ○ Estimate of lost time:
Were other employees exposed? Yes ○ No ○
If so, list names & CWID (use additional sheet if needed):
List suggestions to prevent reoccurrence:

(exposed employee's signature) (today's date)
(supervisor's signature) (print/type name of supervisor)

Complete form and return to EHS, FILE REPORT WITHIN 24 HOURS OF NOTIFICATION
Report can be faxed (744-7148) or emailed ohsp@okstate.edu

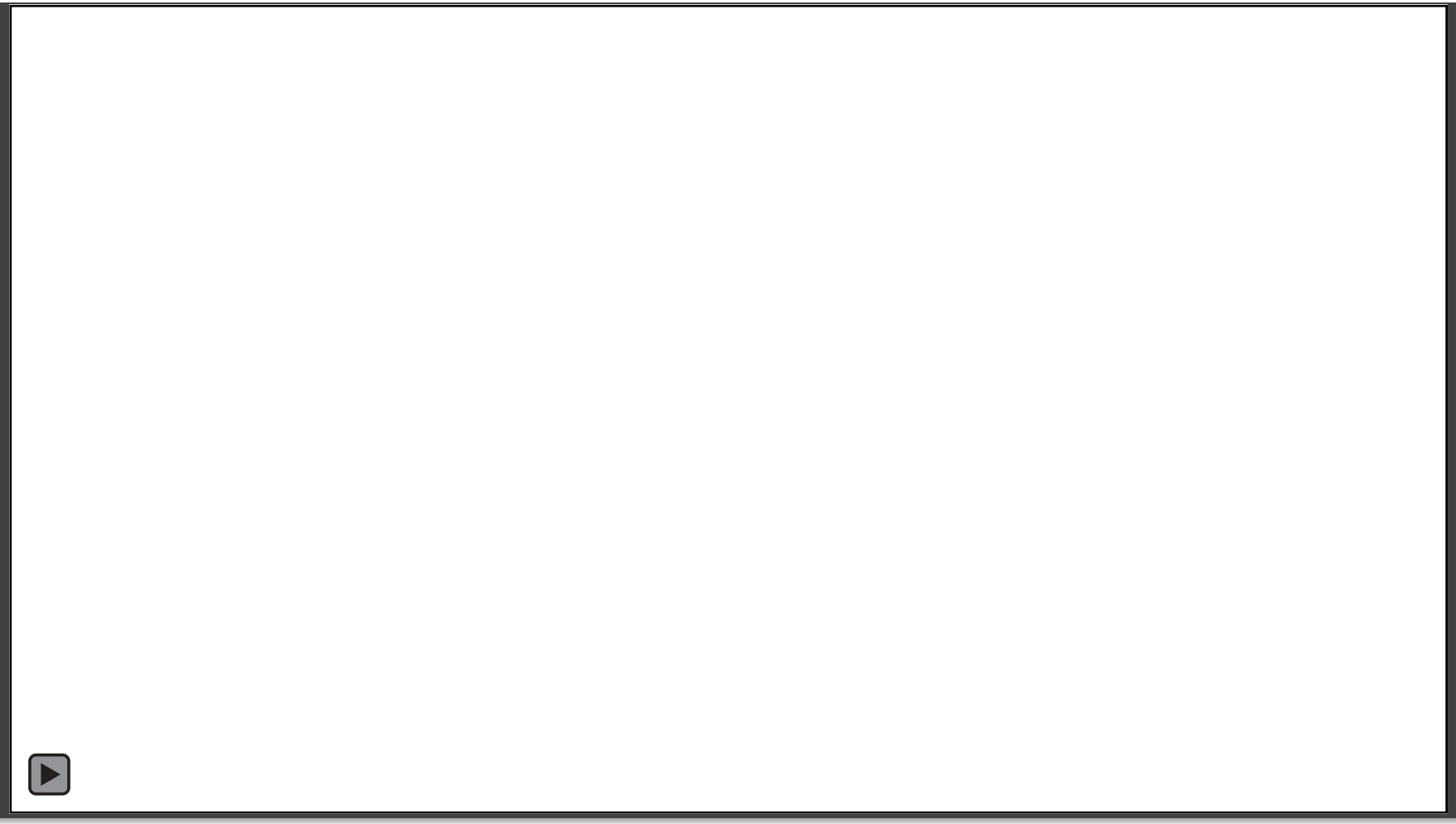
The statements and facts in this form shall not constitute nor be construed to constitute any admission or evidence of liability.

Reviewed by EHS December 2014

Appendix (D) - Sample Sharps Injury Log

Department/Lab:			**Year 20__** *Maintain for 5 years*	
Date	**Type of Device** (e.g., syringe, suture needle)	**Brand Name of Device**	**Work area where injury occurred** (e.g., lab, vet med)	**Brief description of how incident occurred** (e.g., procedure being done, action performed & body part injured)

Review Video



Precautions for Providing First-Aid to a Co-Worker

If possible, always have the patient **self-administer** first aid.

If they cannot self-administer, protect yourself before offering assistance by:

- Wearing clean, leak-proof gloves
- Being aware of personal cuts or broken skin
- Protecting your nose and mouth in the event of splatters or sprays

If you do get blood or OPIM on yourself, immediately wash exposed area with soap and water.

If you get blood or OPIM in your eyes or mucous membranes, flush the area with running water for at least 15 minutes.

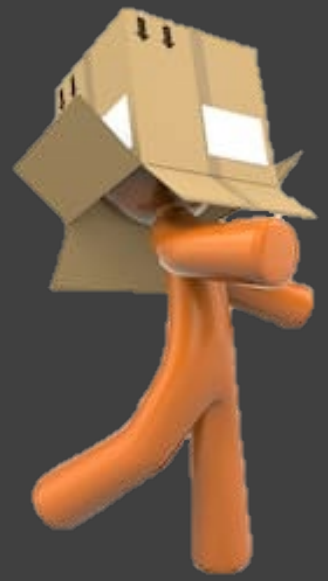
BBP and the US Department of Transportation

- The shipping of infectious substances is highly regulated by the US Department of Transportation (49 CFR 173.134)

- The US DOT classifies infectious substances into two categories:
  - Category A Infectious Substances – Capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs.
  - Category B Infectious Substances – Generally capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposure to it occurs.

BBP and the US Department of Transportation

- Do you perform any of the following tasks:
  - Determine the hazard class of an infectious substance to be shipped?
  - Select packaging for an infectious substance to be shipped?
  - Package an infectious substance?
  - Secure a closure on an infectious substance package?
  - Label a package to indicate it contains an infectious substance?
  - Certify that an infectious substance is in proper condition for transportation?
  - Load an infectious substance package into a transport vehicle?



If yes, you *must* complete training for infectious material shipping.

What should you take away?

- Bloodborne pathogen rules are in place for your health and safety
- Failure to follow these rules is an unnecessary risk that shouldn’t be taken
- “Better safe than sorry"

Let's Play a Game

1	2	3	4	5	6
1	2	3	4	5	6
1	2	3	4	5	6

What is a bloodborne pathogen?

A micro-organism carried in the blood that can cause disease in humans.

How are bloodborne pathogens transmitted?

Through blood or other potentially infectious materials.

What year was the OSHA BBP standard created?

1992

Last updated in 2001.

Name a profession that commonly comes into contact with BBPs

First Responder

Laboratory Worker

Housekeeping

Facilities Maintenance

Health Care Worker

What are the two modes of transmission?

Direct Contact and Indirect Contact

Which form of Hepatitis is commonly a short-term infection?

Hepatitis B

Which form of Hepatitis is commonly a long-term infection?

Hepatitis C

HIV is most commonly passed on through which mode of transmission?

Direct Contact

Does the OSHA standard only cover Hepatitis B, Hepatitis C, and HIV?

No

What does an engineering control do?

Isolates workers from the hazard.

What are administrative/workplace controls?

Rules put in place for how you do your work.

Name a type of PPE

Gloves

Lab Coat

Face Mask/Shield

Respiratory Protection

Special/Closed-Toe Shoes

Protective Suits

What color should a biohazard label be?

Fluorescent orange or red-orange.

What's the main rule of universal precautions?

Treat all blood and OPIM as if they are infectious.

Do you have to pay for your own medical care after an exposure incident?

No. All medical care is paid for by your employer.

What's the first rule of providing first aid to someone?

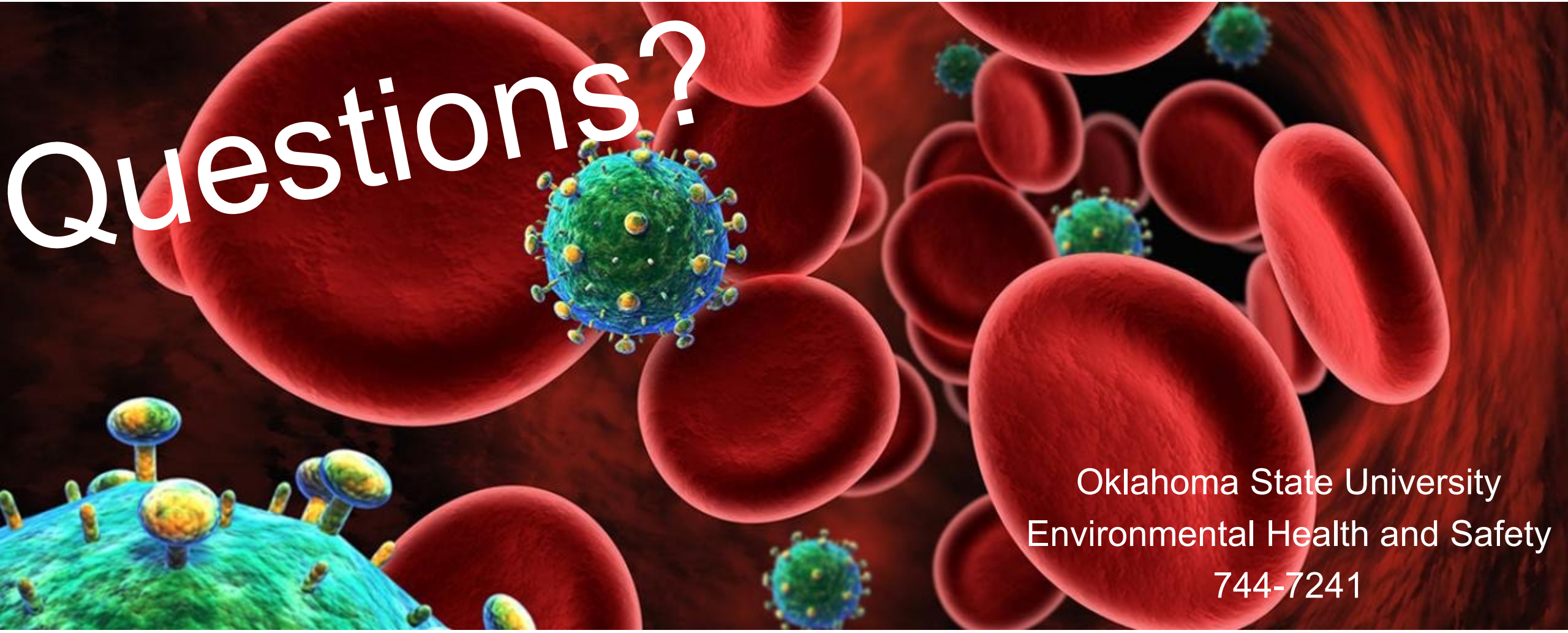
Have the patient self-administer first aid if possible.

Who do you contact if you ever have questions about BBPs on campus?

OSU's Environmental Health and Safety office.

Is it ok to reuse disposable gloves if they are clean?

No. It is never ok to reuse disposable gloves!


Questions?
Oklahoma State University
Environmental Health and Safety
744-7241

Environmental Health and Safety

Programs and services:

- Fire Protection Engineering
- Life Safety and Emergency Preparedness
- Laboratory Safety
- Occupational Safety
- Occupational Health and Medical Surveillance
- Materials Management
- Industrial Hygiene
- Chemical Hygiene
- Safety Training

Location: University Health Services Building, Room 002 (Basement)

Phone Number: 405-744-7241

Email: EHS@okstate.edu

Website: http://ehs.okstate.edu