Welcome BBP Attendees!
Bloodborne Pathogens Program
- Please Pick up Handout
  1. Hepatitis B Vaccination Form
  2. Hepatitis B Vaccine Information Sheet
  3. Copy of Slides

Bloodborne Pathogens Training for Researchers
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Hepatitis B Vaccine form
- Needs to be filled out unless you have already done so in the past
- If you have had vaccinations, check the line stating this, put in date or year
- If you decline the vaccination, check this line, sign and date

Overview
- About the Bloodborne Pathogens Program
- About Bloodborne Pathogens (BBP)
- Exposure Control
- What to do if you have an exposure
- Requirements for HIV/HCV/HBV labs
- Resources

Bloodborne Pathogen (BBP) Rule
- Washington Administrative Code (WAC) 296-823
  - Enacted in 1993
  - Safe sharps requirements in 2000
    (Needlestick Safety and Prevention Act)
- Reduce risk of BBP exposure to workers
- Annual Training required
UW BBP Program

• All UW employees with a reasonably anticipated potential for exposure to human source materials, including human blood and its components, human tissue, human cell lines, as well as medications derived from blood (e.g., immune globulins, albumin) and other potentially infectious materials (OPIM), are required to comply with the UW BBP Program.

• Requirements of the UW BBP Program:
  – Developing a BBP Exposure Control Plan
  – Offering the hepatitis B vaccine
  – Training

BBP Statistics

• In Washington, Labor & Industries (L&I) estimates ~44,000 needlestick injuries per year
• By Dec, 31, 2000, CDC reports:
  – 57 health care workers have seroconverted following occupational exposure to HIV
  – 25 have developed AIDS
  – 3 were lab workers working with concentrated virus
  – Percutaneous exposure was the most common route

Roles & Responsibilities

• EH&S
  – Administer the UW BBP Program
  – Assist in obtaining the Hepatitis B Vaccine
  – Provide BBP Training
  – Issue Biological Use Authorization to labs
  – Consultation and Incident/accident follow-up investigation

• Employee Health Center
  – Provide clinical services
  – Administer hepatitis B vaccine
  – Provide Post-exposure counseling

• Principal Investigator
  – ID hazards and who needs to be in the BBP Program
  – Develop/review lab Exposure Control Plan
  – Provide personal protective equipment
  – Provide lab specific safety training
  – Enforce safety rules

• Staff (You)
  – Follow the exposure control plan
  – Wear required PPE
  – Ask questions
  – Suggest safer work practices/ procedures to your PI
How are Suggestions or changes to work practices communicated?

1. staff meetings
2. email
3. 1:1
4. suggestion box/other
5. Don’t know/not sure

Bloodborne Pathogens

- Microorganisms that are present in human blood and its components and can cause disease.
  - Human Immunodeficiency Virus (HIV) - AIDS
  - Hepatitis B virus (HBV) – Hepatitis B
  - Hepatitis C virus (HCV) – Hepatitis C
  - Brucella spp. [bacterium] – Brucellosis
  - Babesia (parasite) - Babesiosis
  - Treponema pallidum - Syphilis
  - Arboviruses - Viral hemorrhagic fever, West Nile Virus
  - Prions - Creutzfeldt-Jakob Disease
  - Plasmodium spp. - Malaria

Other Potentially Infectious Materials (OPIM)

- HIV/HBV/HCV containing cultures (cell, tissue, or organ), and solutions
- Blood, organs or tissues from animals infected w/ HIV/HBV/HCV
- Human cell lines including established
- Unfixed tissues or organs, semen, cerebrospinal fluid, peritoneal fluid, pericardial fluid, amniotic fluid, synovial fluid, vaginal secretions
- Any body fluid contaminated with blood or OPIM

Not Risk for BBP transmission

- ...unless you can SEE the blood in them...but still handle with caution.
  - Urine
  - Feces
  - Vomit
  - Sweat
  - Tears
  - Saliva

Where will I go if I have a question about “OPIM”?

- Check the Washington Administrative Code (WAC) 296-823
- See the EH&S website: http://www.ehs.washington.edu/rbs/bbp.shtm
- Call Research and Occupational Safety: 206-221-7770
- Check the lab Biosafety Manual http://www.ehs.washington.edu/rbsbiosafety/bsmanualindex.shtm
- Ask my manager

Transmission of BBP

Occupational Exposure

- 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
BBP - Occupational Exposure

- Skin
  - Needle sticks or contaminated sharps injuries
  - Open wound contamination: cut, rash, dermatitis, psoriasis
- Mucous membrane exposure: eyes, nose, mouth

Transmission Risk of BBP
Risk of infection depends on several factors:

- Pathogen involved
- Type/route of exposure
- Amount of virus in infected blood during exposure
- Amount of infected blood involved in the exposure
- If post-exposure treatment was taken
- Specific immune response of infected individual

Transmission Risk following Exposure to Infected Blood

<table>
<thead>
<tr>
<th>Virus</th>
<th># of virus particles/ml of blood</th>
<th>Risk of infection following parenteral (needlestick or cut) exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>$10^7-10^{11}$ (Millions – trillions)</td>
<td>1 in 3 (30%)</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>$10^6$ (Millions)</td>
<td>1 in 30 (3%)</td>
</tr>
<tr>
<td>HIV (AIDS)</td>
<td>$10-10^8$ (Tens - thousands)</td>
<td>1 in 300 (0.3%)</td>
</tr>
</tbody>
</table>

Source: Centers for Disease Control and Prevention

Hepatitis B
- Statistically the greatest risk
- 6-30% risk following exposure incident (non-immunized)
- Incubation period is 6 weeks- 6 months (45-180 days)
- 30-50% of infected develop clinical illness
- 0.5-1% of infected develop rapid fatal liver disease
- 2-10% of infected develop chronic active hepatitis-carrier state, infectious for life.

Very stable-persists at room temp for 7 days.

Hepatitis C
- Most common chronic bloodborne infection
- 80% infected without symptoms (CDC)
- Incubation period 2 weeks - 6 months
- ~16 hrs-4 days on surfaces
- No vaccine

Estimated Total Chronic HCV Infections Worldwide: 170 MILLION

Source: World Health Organization hepatitis C prevalance, 2016 and unpublished data

Hepatitis B and C Symptoms

- jaundice
- fatigue
- loss of appetite
- nausea
- abdominal discomfort
- dark urine
- clay-colored stool

Normal eyes

Jaundiced eyes
Human Immunodeficiency Virus (HIV)

- Fragile – lives only a few hours outside the body
- Causes Acquired Immunodeficiency Syndrome (AIDS)
- AIDS allows development of opportunistic disease, which ultimately causes death.
- A flu-like illness can occur 1-6 weeks after exposure to the virus:
  - Fever, sweats, malaise, muscle pains, nausea, diarrhea
  - Enlarged lymph nodes, mycological oral infections, fatigue, weight loss
- Symptom-free period of 5-10 years can occur

What is the most common route of exposure to BBP in the workplace?

1. Injury from contaminated needlesticks and/or sharps
2. Eye and mucous membrane exposure
3. Open wound contamination (cut, dermatitis, psoriasis)

Exposure Control Plan (ECP)

- Must include BBP standard (WA State Rule) online at: http://www.lni.wa.gov/safety/rules/chapter/823/
- Biosafety Manual contains UW Core ECP, in Appendix A
  See online at: http://www.ehs.washington.edu/rbsbiosafe/bsmanualindex.shtm

Exposure Control Plan

1. Exposure Determination
2. Method of Compliance or implementation
3. Hepatitis B vaccination, Post-Exposure evaluation and follow-up
4. Communication of Hazards to employees
5. Record keeping

Exposure Control Plan

1. Exposure Determination:
   - By job classification
   - By tasks and procedures
   - Without consideration of PPE worn

2. Control Employee Exposure:
   - Universal precautions
   - Engineering controls
   - Work practices
   - Personal Protective Equipment
ECP- Universal Precautions

- Blood and OPIM ALWAYS considered infectious
- Appropriate barriers and procedures must be used when contact with blood or OPIM is anticipated

Safe BSC Use Video: Proper Use of a Biological Safety Cabinet (SD - 2002)

An excellent review of safe BSC work practices covering pre-planning, PPE, cabinet preparation, work practices, spills, and post process steps.

NOTE! There are three differences for BSC work at the UW.

- Important: Sharps are not prohibited in BSCs at the UW.
- Water can be used after the decontaminating bleach and is recommended by Baker for their BSCs.
- Good hand washing is more about sudsing soap and scrubbing for at least 20 seconds than the use of germicidal soap.

http://vimeo.com/groups/34691/videos/7642083

ECP- Engineering Controls

- Centrifuge Safety Features
  - Receive training
  - Safety cups/buckets or O-ring
  - When in Biosafety Cabinet (BSC) place at rear, don’t perform other work while running
  - Wait 5 minutes to unload
  - Stop immediately for unusual vibration or noise and notify supervisor
  - Ensure proper balancing
  - Do not overfill

ECP- Engineering Controls

- Safer Medical Devices
  - Needleless systems
  - Sharps with engineered sharps injury protections (SESIP)
  - Self-blunting needles
  - Plastic capillary tubes
  - Exemptions for safer needle requirements, if not using these

Sharps disposal containers
- Closable
- Puncture-resistant
- Leak-proof
- Labeled or color-coded
- Upright, conveniently placed in area where sharps used
- DO NOT OVERFILL!
Sharps Containers with Problems

ECP-Work Practice Controls

Handle sharps safely to minimize exposure to blood or OPIM:

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

More Tips on Safe Sharps Handling

- Know what Sharps include:
  http://www.ehs.washington.edu/rbsresplan/sharp.shtm

- Develop and implement specific policies for safe handling:
  http://safeneedle.org/us-needlesticks/preventing-needlestick-injuries-a-checklist/

- Do not handle broken glassware directly by hand

ECP-Work Practice Controls

- Hand washing
- No food/cosmetics
- No mouth pipetting
- Dispose of gloves after use

ECP-Work Practice Controls

- 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

DEMO of GLOVE REMOVAL:
ECP-Work Practice Controls

- Written cleaning and decontamination schedule and procedures
- Decontamination Agents:
  - Bleach 1:10
  - EPA certified agent (alcohol is not)
  - Quaternary Compounds
- Premixed:
  - Environcide
  - Clavicide
- Contact time is critical

Key Concept
Perform all tasks in a manner that reduces spraying, splashing or aerosolization.

Define sharps waste
ALWAYS sharps waste:
- needles and IV tubing with needles
- syringes without needles
- lancets
- scalpel blades
Sharps waste if CONTAMINATED with biohazards (including recombinant or synthetic DNA/RNA):
- razor blades
- broken glass
- fragile glass items, Pasteur pipettes,
- slides and cover slips

ECP- Work Practice Controls

- Decontamination
  1. Place absorbent material atop spill, sufficiently spray/cover entire area. Some start at the edges and work in, others just cover the area.
  2. You want to ensure that you cover the contaminated area.

SPILLS VIDEO:

Regulated Waste

- Close immediately before removing or replacing
- Place in second container if leaking possible or if outside contamination of primary container occurs
- Contaminated equipment must have biohazard sign attached-inform supervisor

BIOHAZARDOUS WASTE, incl. Flow Charts
http://www.ehs.washington.edu/ohsreslab/biowaste.shtm

ECP- Signs and Labels

http://www.ehs.washington.edu/rbsbiosafe/postbz.shtm
Precautions required when transporting blood

- Put in secondary leakproof container
  - Plastic ziplock, or styrofoam
- If in a Biohazard container or other designated container, don’t need label
  - Consider where the sample will travel (the end user)

More information on EH&S website
http://www.ehs.washington.edu/ohsreslab/biowaste.shtm#trans

ECP-Personal Protective Equipment (PPE)

Type and amount of PPE required depends on the task and anticipated exposure.
- Must not permit blood or OPIM to pass through or reach outer or inner clothing, mucous membranes or skin.
- If clothing becomes contaminated, immediately remove it.
- Must be removed prior to leaving the work area. PPE must not be worn in common areas.
- Provided at no cost to employee.

Nitrile gloves for alcohol.

ECP - Laundry

For Contaminated articles:
- Handle as little as possible
  - Bag/contain 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
- Consolidated Laundry, NOT your home laundry, is to be used for laundering

ECP - Medical Management

3. Medical Management
   a. Hepatitis B vaccine
   b. Post exposure evaluation
   c. Follow-up

What to do if exposed?

1. DO First Aid
   - Parenteral (break through skin): Immediately thoroughly wash wound with sudsing soap and water—for 15 minutes.
   - Mucous Membrane: Immediately thoroughly flush mucous membrane with water for 15 minutes.

2. GET Medical Help
**ECP-Medical Management**

*How to Get Medical Help?*

- Call UW Employee Health Center at 206-685-1026
  - Harborview Sites: 206-744-3081
- After hours or clinic is closed, go to nearest Emergency Room (ER)
- Call 911
- Follow the [EH&S Exposure Poster](http://www.ehs.washington.edu/manuals/posters/exposureresponseposter.pdf)

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**ECP-Medical Management: Post Exposure Evaluation**

- Document exposure incident and ID source
- Testing and Post-Exposure treatment
- Counseling
- Evaluation and follow-up

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**Health Care Professional Written Opinion for Need for Hepatitis B vaccination**

Employee to receive within 15 days of the evaluation

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**ECP- Hazard Communication**

*Hazard Communication*

- Annual UW BBP training
- Laboratory specific hazards training
- Exposure Control Plan – annual review

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**ECP-Records**

*Record Keeping*

- Training records- EH&S and PI- keep 3 years
- Medical records-kept at Employee Health Center for duration of employment plus 30 years
- You &/or Supervisor fill out the OARS (online) report after incident-EHS

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**Additional Requirements**

*HIV/HBV/HCV Research Labs*

- Lab specific biosafety manual – reviewed annually
- Special Practices
  - Labs doors closed when working with virus
  - No bench work/must use BSC
  - Limited needle/syringe use
  - Limited access only to those aware of hazards
  - PPE in labs—NOT to be worn outside lab, decontaminated before laundered.
- Training
  - Demonstrated proficiency-microbiological practices and practices and operations specific to the facility BEFORE work w/virus.
Resources

- Centers for Disease Control and Prevention (CDC) Biosafety in Microbiological and Biomedical Laboratories (BMBL) website: [http://www.cdc.gov/biosafety/publications/bmbl5/index.htm](http://www.cdc.gov/biosafety/publications/bmbl5/index.htm)

QUESTIONS?

*"If I hear & see - I learn, but may forget,
But if I do, I understand."

Be sure to look at your workplace Exposure Control Plan!

See you next year... online!