# R&D Annual Bloodborne Pathogen Training

2019

# Policy at VA PSHCS

The VA PSHCS is committed to providing a safe and healthy work environment for its entire staff. In pursuit of this endeavour, an Exposure Control Plan (ECP), which includes bloodborne pathogen training, is provided to eliminate or minimize occupational exposure to bloodborne pathogens in accordance with OSHA standard 29 CFR 1910.1030 “Occupational Exposure to Bloodborne Pathogens”.

# OSHA's Bloodborne Pathogens Standard

The OSHA BBP standard [29 CFR 1910.1030] applies to all **occupational** exposures to blood or OPIM. It recommends:

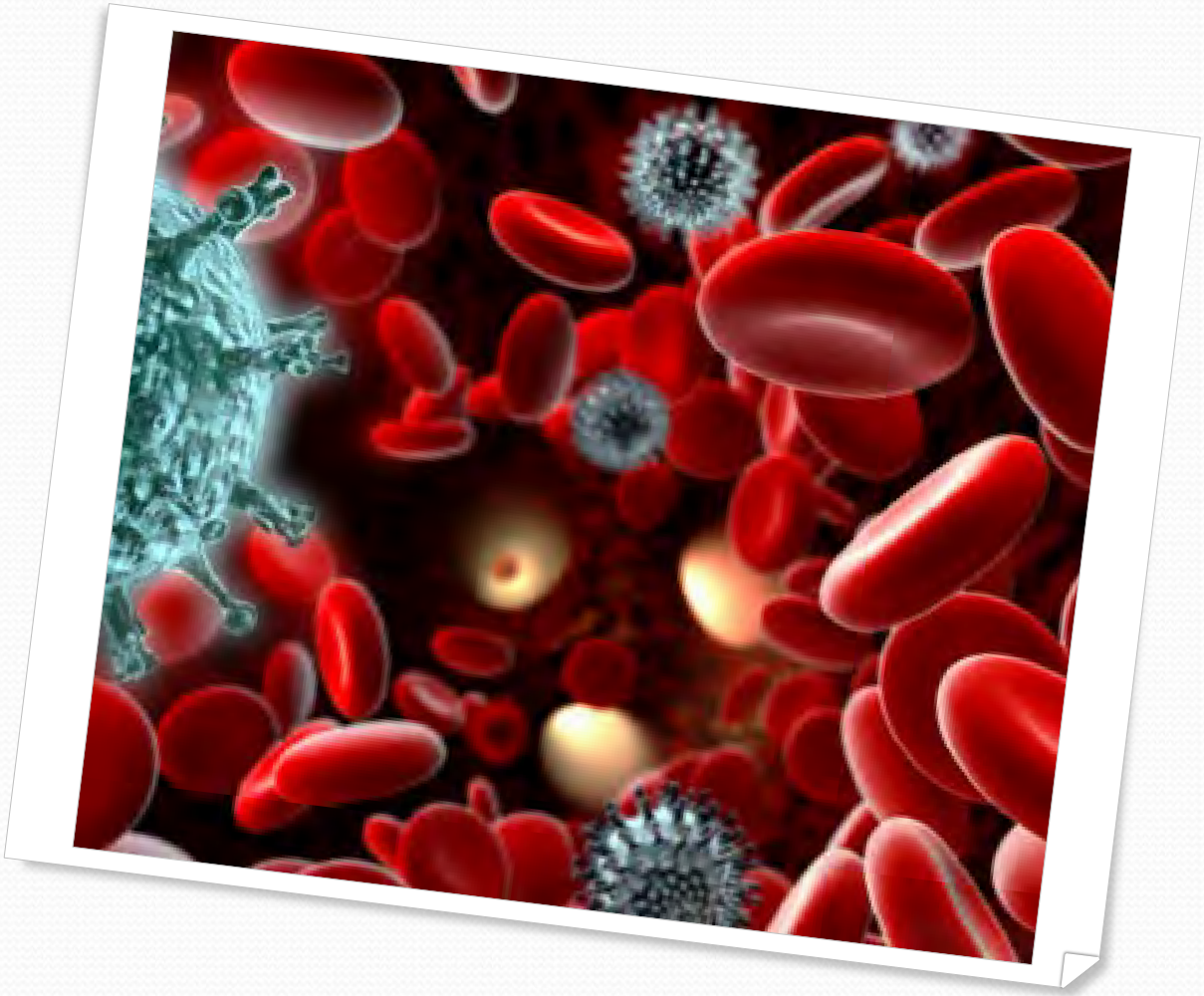
- A written **E**xposure **C**ontrol **P**lan(**ECP**)
- Use of labels & signs to communicate hazards
- Engineering controls and work practices to eliminate or minimize worker exposure
- Provide **P**ersonal **P**rotective **E**quipment(**PPE**)
- Hepatitis B vaccinations **must be** available to all workers with **occupational exposure**

# Bloodborne Pathogens and Other Potentially Infectious Materials (OPIM)

2019

# What are bloodborne pathogens?

They are pathogenic organisms that are present in human blood with the potential to cause disease in those humans exposed to them.

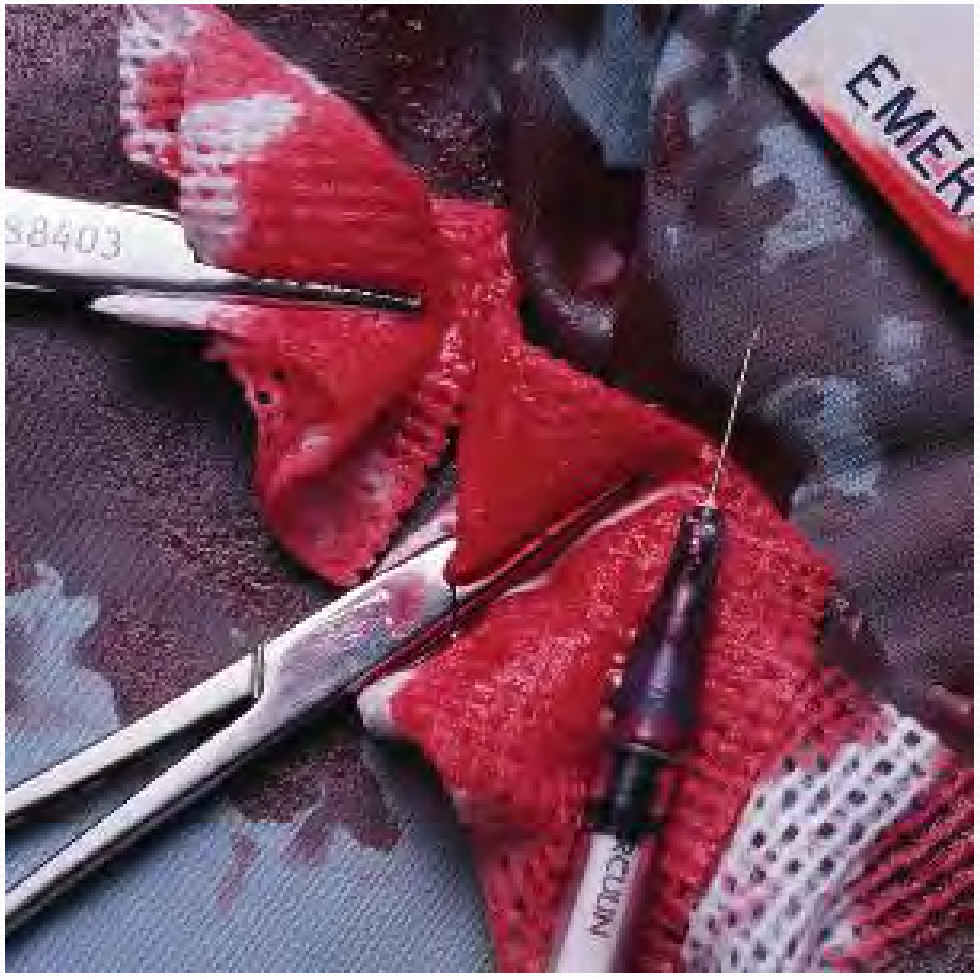


# What constitutes other potentially infectious materials (OPIM) ?

- “The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids;
- Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and
- HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.” (OSHA)

# Regulated Biohazardous Waste

“Liquid or semi-liquid or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated needles and sharps; and any other wastes containing blood or potentially infectious materials.” (OSHA)



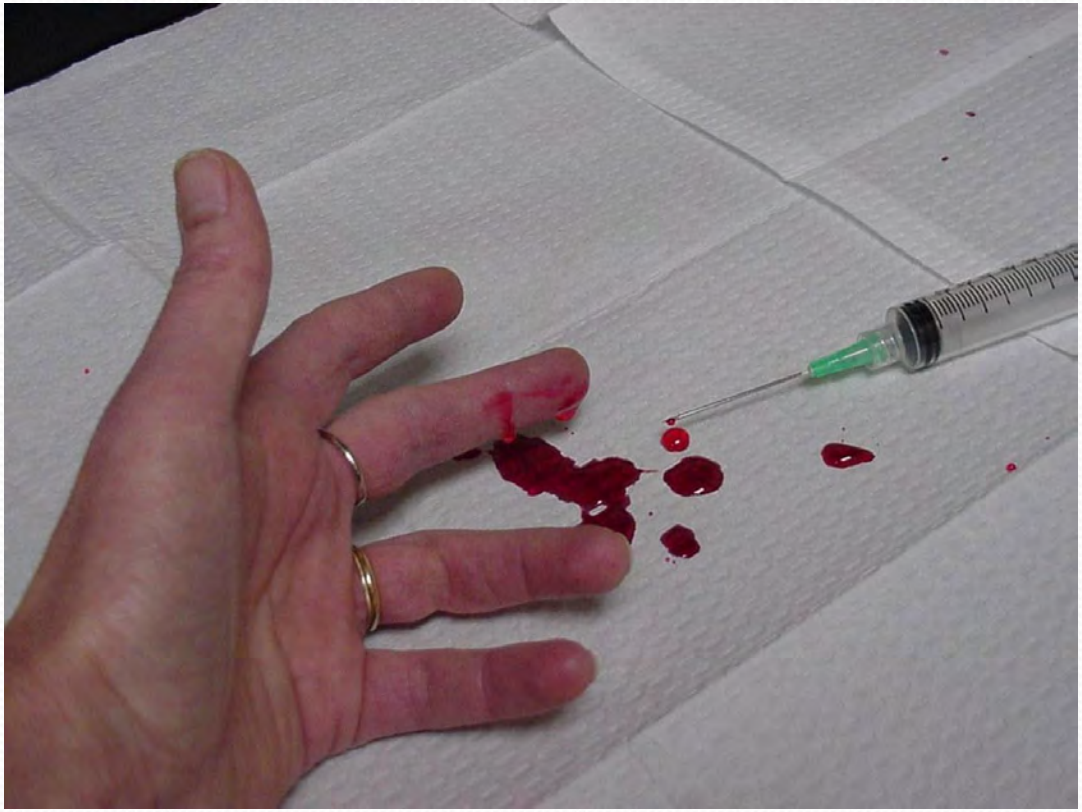
# Risk of Exposure to BBP

More than 8 million healthcare workers in the US work in hospitals and other healthcare settings.

Estimates indicate that between 600,000 & 800,000 healthcare workers receive needlestick or percutaneous injuries, annually.

Most injuries involve nursing staff but lab staff, physicians, housekeepers & other healthcare workers are also injured.

The 3 most important BBP's to be aware of are: HIV, Hepatitis B & C . Infections caused by each of these pathogens are potentially life threatening & preventable.



# R&D BBP Exposure Control Plan

2019

# R&D BBP Exposure Control Plan

**Should contain:**

1. Training of employees
2. Determination of employee exposure
3. Communication of hazards to employees
4. Methods of exposure control e.g., PPE
5. Hepatitis B vaccination available to all employees
6. Post-exposure evaluation & follow-up
7. Procedures for evaluating an exposure incident
8. Record keeping

# Training of New Employees

All new R&D employees & those requiring secure access to R&D must receive training from all 3 safety officers:

| | |
|---|---|
| Corinne Gajdusek, PhD | R&D Safety Officer, Ext. 6.1854 |
| Christopher Peterson | R&D Radiation Safety Officer, Ext. 6. 1433 |
| Jacqueline Murray-Wijelath, PhD, RBP | R&D Biosafety Officer, Ext. 6.1238 |

The training of new employees (i.e., Research, Non-Research, Clinical) is coordinated and recorded by:

Staff Assistant (HR, IP & Training/Credentialing)
Benjamin Brainard
Mailstop: S-151
Phone: (206) 764-4666
Fax: (206) 764-2391
Email: benjamin.brainard@va.gov

New employees require training from all 3 safety officers as all areas of Research have chemical, biological, and/or radiation hazards.

# Determination of Employee Exposure

All new employees receive biosafety training to explain the biological hazards they may encounter in Research regardless of whether they are Research staff or non-Research staff.

The importance of personal biosafety is explained to both groups: importance of frequent handwashing, transmission of bacteria & viruses on fomites, what are fomites, the regular cleaning with disinfectant wipes of ID badges, cell phones, door handles, etc.

Don't expect other people to have good biosafety practices.

Learn what to do in the event of a biological exposure during work hours, after-hours, if alone & immobile, and the vulnerability associated with secure access.

**VAPS R&D Biosafety Orientation Training**

- **Personal Protective Equipment (PPE)**
  - Lab coat or gown
  - Gloves – double glove for extra protection; one glove rule in hallways.
  - Eye protection [safety glasses, goggles, face shield, hood] – protect against splashes, aerosols.
  - Ear protection [ear plugs, muffler] – sonication.
  - Spills - follow procedure outlined in training DVD and R&D Biosafety Guidelines.
  - Liquid Nitrogen – before first time use, contact R&D Biosafety Officer for training, 6.1238.
- **Cell Culture**
  - Training is responsibility of PI but can be given, if required.
  - Biosafety Cabinets - for tutorial see http://www.ehso.emory.edu/research-safety/bsc.html
- **Biological Waste Disposal**
  - Liquid waste is disposed as a 10% bleach [(v/v) @ pH6-9] solution down sink.
  - Solid biological waste is disposed into orange autoclave bags(double bagged) inside metal cans labelled as "Regulated Medical Waste". Exceptions: animal tissue, hazardous chemicals (e.g., formalin, phenol), and tips used to dispense hazardous chemicals. Plastic serological pipettes that have been used to dispense non-hazardous substances can also be disposed of as biomedical waste.
  - Use safety needles whenever possible. Do not recap needles. Sharps & needles are disposed in red needle boxes. Full boxes are placed on janitor's cart, next to elevator in Bldg. 8, or in red bin outside autoclave room (1/618) for disposal (NOT in trash!). Yellow, chemotherapy needle boxes are disposed the same way. In the event of a splash or needlestick, rinse the affected area then go directly to Employee Occupational Health (Bldg. 1, rooms 116 A-B, E-H.; 7:30-16:00; 6.6710) for treatment. If after hours, go to the Emergency Room (Bldg. 100; 6.2600 & 6.6630).
- **Employee Occupational Health (Building 1, rooms 116 A-B, E-H.; 7:30-16:00)**
  - Hepatitis B vaccination, other vaccination updates, and titre verifications. Call Melody Shields (6.3575; 1/116B) to make appointment.
  - Drop in visits for workplace injuries or illnesses [M-F, 7:30-16:00]
  - Minor non-work related health issues call ahead (6.3575) or drop by and ask (limited permission to attend to non-work related issues).

**Case Investigations of Infectious Diseases Occurring in Workplaces, United States, 2006–2015**

CDC EID journal Volume 25 Number 3—March 2019 Main Article

## Abstract:

Workers in specific settings and activities are at increased risk for certain infectious diseases. When an infectious disease case occurs in a worker, investigators need to understand the mechanisms of disease propagation in the workplace. Few publications have explored these factors in the United States; a literature search yielded 66 investigations of infectious disease occurring in US workplaces during 2006–2015. ***Reported cases appear to be concentrated in specific industries and occupations, especially the healthcare industry, laboratory workers, animal workers, and public service workers.*** A hierarchy-of-controls approach can help determine how to implement effective preventive measures in workplaces. Consideration of occupational risk factors and control of occupational exposures will help prevent disease transmission in the workplace and protect workers' health.

https://wwwnc.cdc.gov/eid/article/25/3/18-0708_article

# Personal Protective Equipment

- Lab coat or gown
- Gloves
- Safety goggles
- Face masks
- Full faceshield /
  safety goggles + face mask
- Shoe covers
- Ear plugs

# Engineering Controls – designed to protect the user

**e.g., Safety Needles**

**e.g., Biosafety Cabinets**

# Communication Of Hazards to Employees


**Area/Room:** Building 1 / Room 640, Research Laboratory
**Department:** Advanced Medical Research
**Principal Investigator:** Mary Wallace, MD, PhD
**Lab Supervisor:** James Smith, PhD

**Emergency/After Hours Contacts**

| Name | Location | Office Phone | Cell/Home Phone |
|---|---|---|---|
| Mary Wallace | Bldg 1/ rm 640 | 1-206-277-9876 | 1-206-881-5643 |
| James Smith | Bldg 1 /rm 866 | 1-206-277-0085 | 1-425-766-3471 |

**Date Posted:** Monday, 26-Mar-18 19:22:18 EDT

*The information on this sign must be updated at least annually or in the event of any change of emergency contacts or special hazards.*

---

**NOTE: New lab signage template approved by the RSS in 2018.** Ideally, the information will be on one page. This example has all boxes checked to show all the hazards available in the template. For biosecurity reasons, only the biosafety level is posted, not the actual organism/toxin. For privacy, the PI decides what personal contact information can be displayed.

# Use of labels & signs to warn of biohazard

The biohazard symbol is used internationally to indicate the **actual** or **potential presence** of a biohazard.

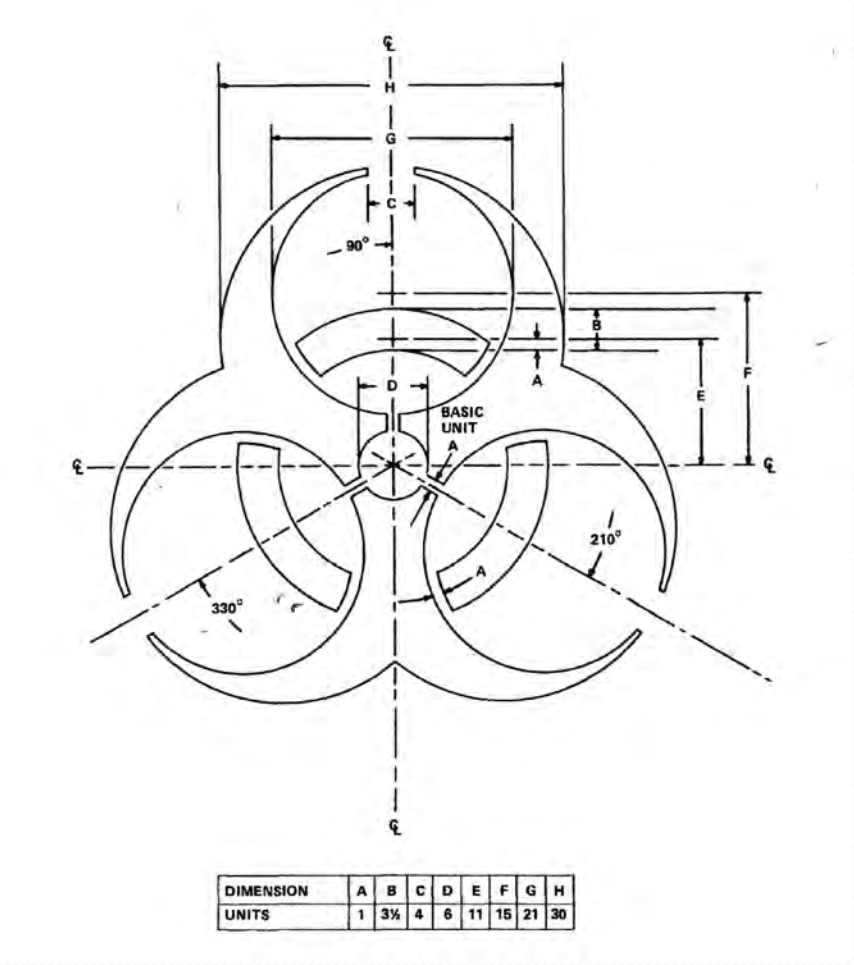
It should be posted on*:

1) Lab doors/entrances
2) Equipment - fridges, freezers, centrifuges
3) Storage & transportation containers
4) Waste containers


*BMBL, 5th edition, 2009; OSHA BBP Standard 29 CFR.

# The Iconic Biohazard Symbol

- The Biohazard symbol was developed by Charles L. Baldwin of Dow Chemicals and Robert S. Runkle of the NIH in 1966*.
- The symbol was chosen by the public to have the highest ‘meaningfulness & memorability scores”.
- There were 6 criteria for the warning graphic:
  1. Striking in form.
  2. Unique & unambiguous.
  3. Quickly recognizable, easily recalled.
  4. Easily stenciled.
  5. Symmetrical; identical from all angles.
  6. Acceptable to varying ethnic backgrounds.




| DIMENSION | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| UNITS | 1 | 3½ | 4 | 6 | 11 | 15 | 21 | 30 |

*: NYTimes: http://www.hms.harvard.edu/orsp/coms/BiosafetyResources/History-of-Biohazard-Symbol.htm

Science: http://www.hms.harvard.edu/orsp/coms/BiosafetyResources/1967-10-13-Science-paper-Biohazard-Symbol.pdf

# Hepatitis B (HBV) Vaccination

- HBV infection rate is 6-30% after needle-stick from HBV-infected patients
- Infection is only a risk to those not immune to HBV
- Immunity to HBV is acquired by vaccination or prior infection
- Vaccination after HBV exposure is still 90% effective in preventing HBV infection

# Employee Occupational Health [1/116 A-B,E-H; 7:30 – 16:00]

Follows the CDC guidelines for vaccination.

Provides Hepatitis B vaccination, other vaccination updates, and titre verifications, to **all** employees.

Contact Melody Shields (6.3575; 1/116B) to make appointment.

Drop in visits for workplace injuries or illnesses [M-F, 7:30-16:00]

Minor non-work related health issues call ahead (6.3575) or drop by and ask (limited permission to attend to non-work related issues).

# Needlestick Injuries

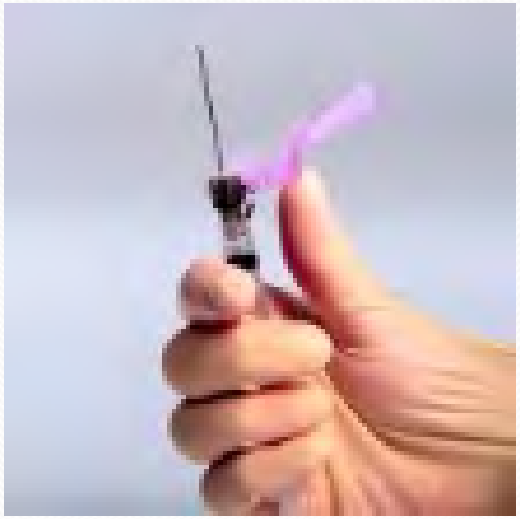
Healthcare workers who use or may be exposed to needles are at increased risk of needlestick injury. Such injuries can lead to serious or fatal infections with blood borne pathogens such as HIV, HBV, and HCV.

<u>For prevention</u>:

1. Eliminate the use of needles where safe & effective alternatives are available.
2. Implement the use of devices with safety features.
3. Do not recap needles.

# Safe Use of Needles & Syringes with Biologicals

- Whenever possible, find alternatives to the use of needles or use safety needles.
- OSHA recommends the use of safety needles when working with: human specimens, any lab products or animal blood & tissue infected with HBV or HIV, zoonotic agents e.g., LCMV, and toxic chemicals.
- Syringe spray-back accidents typically occur when the syringe or injection needle become plugged. If the syringe becomes plugged, do not push the plunger harder. High pressures inside the syringe can cause the plunger seal to fail or the barrel to crack spraying out liquid.



# Post-Exposure Evaluation & Follow-Up

**What to do after a needlestick or splash injury:**

**1.** Clean and irrigate area of exposure [i.e., rinse area of exposure with water (& soap) for 15 minutes].

**2.** During work hours, go directly to Employee Occupational Health (Building 1, rooms 116 A-B, E-H.; 7:30-16:00) for treatment. If EOH are unable to provide treatment (for whatever reason) or if after hours, go to the Emergency Room (Bldg. 100).

**3.** Within 72 hours of the incident, enter the incident into ECOMP (Employees' Compensation Operations & Management Portal) using any internet-connected computer. Instructions are available on the TMS module "ECOMP- how to file a form"

**4.** Within 5 working days after an accident, complete and submit the Research Accident Reporting Form (RARF) to the Research Safety Subcommittee (RSS)

# Procedures for Evaluating an Exposure Incident

Within 5 working days after an accident, complete and submit the Research Accident Reporting Form (RARF) to the Research Safety Subcommittee (RSS) —► —► —►

Accident Reporting is a fixed item on the monthly RSS Agenda for discussion by it's members. The OSHA accident reporting guidelines are used to decide what is a reportable injury or an injury that required only first aid (non-reportable).

If it is a reportable injury, the RSS make recommendations to help prevent a similar injury from happening again. A report is then filed with the Office of Research Oversight.

**VA Puget Sound Health Care System**
**Research & Development**
**Research Safety Subcommittee (RSS)**
**Research Accident Reporting Form** PI Name: ► MIRB #: ►

This form is used to report an accident that has taken place in a research area. All accidents occurring in a research area must be reported to the RSS within 5 business days of the incident.

Submit completed form to the R&D Safety Officer.
The R&D Safety Officer and RSS Chair must be immediately notified of any death in a research area.
Before filing this form, please obtain care for the injured individual.

| | | |
|---|---|---|
| **Principal Investigator (PI):** | **Email** | **Phone** |
| **Name of Individual Submitting Report:** | **Email** | **Phone** |
| **Role of Individual Submitting Report:** | | |
| **Study Title:** | | |

https://center.puget-sound.med.va.gov/sites/rd/SiteAssets/SitePages/Research%20Safety%20Subcommittee/2019%20Research%20Accident%20Reporting%20Form.pdf

# R&D Biosafety reminders

2019

# Know where to throw!

- Get informed & know how to correctly dispose of blood, OPIM, needles, etc., in your service area.
- Procedures are different between Clinical, ARF and R&D.
- Clinical & ARF use red* biohazard bags. R&D uses only orange*: processed on site.
- *Red: unprocessed biohazard waste
- *Orange: processed biohazard waste
- If in doubt, contact R&D BSO (6.1238)

# R&D Solid Biohazard Waste Disposal

**ORANGE Biohazard bags (double bag):**

**Label with Name, Room #, Ext #**


**Sharps containers:**

**Always upright, secured in base or holder.**

**Label with Name, Room #, Ext #**

# BBP SPILL KIT - CLINICAL

- BBP spill kits must be kept on site & located centrally in each major area where biohazardous waste is generated or stored.

- They should contain: safety glasses, face masks, moisture proof aprons, gloves, absorbent material, biohazard autoclave bag, disinfectant, & scoop/forceps for handling sharps.

# BIOLOGICAL SPILL – R&D

- Reduce/control the hazard of aerosol generation as quickly as possible.
- Aerosols produce the greatest danger to everyone especially if the agent can be inhaled & produce disease by this route of exposure.
- In the event of a biological spill in the lab, have everyone leave the lab immediately then call the R&D BSO for assistance (6.1238). With help from the R&D BSO, the cleanup procedure detailed in the R&D Biosafety Guidelines, Section 7, will be followed.
- PPE, freshly prepared 10% bleach, paper towels & biohazard bags, are the minimum materials required for cleanup.

# Use of liquid Nitrogen in R&D

- First-time users of liquid Nitrogen must contact the R&D Biosafety Officer (6.1238) for training **PRIOR** to use.
- Training will provide guidance on the safe use and handling of sample storage in cryo-freezers, decanting liquid Nitrogen from cryo-storage tanks, and the PPE to be worn.
- OSHA Quick Facts Lab Safety: Cryogens and dry ice. [https://www.osha.gov/Publications/laboratory/OSHAquickfacts-lab-safety-cryogens-dryice.pdf ]

# Fomites

By definition, fomites are non-living objects (e.g., cell phones, calculators, earbuds, etc.) that can transmit/carry infectious agents from one place to another (e.g. from lab to home & vice versa.)

To prevent the transmission of potentially infectious agents, keep items that you work with in the lab, in the lab, or disinfect them before taking home, or don't take them into the lab. Disinfect your ID badges frequently with disinfectant wipes.

The CDC has documented several incidences of the transmission of Salmonella from clinical and teaching labs to the homes of students and employees (https://www.cdc.gov/salmonella/2011/lab-exposure-1-17-2012.html).

Recent studies show that cell phones are increasingly being identified as fomites capable of potentially transmitting infections (https://www.researchgate.net/publication/316684130_CELL_PHONES_OF_HEALTHCARE_PROVIDERS_AS_FOMITES_HARBOURING_POTENTIAL_PATHOGENIC_MICROORGANISMS).

As cell phones are a convenient tool for recording data in the research setting, it is difficult to prevent their use. Therefore, if they are used in the lab, it is advisable to surface disinfect cell phones with wipes after leaving the lab or to use a commercially available disposable, cell phone cover specifically designed for the research environment (https://www.neotechproducts.com/n17/wp-content/uploads/2017/07/M007_RevG_CellShield-Wipe_Sell_Sheet.pdf).

# Don’t take your work home!

- **Think about what you use in the lab that you take home e.g., cell phone, pens, ID badge, ear buds. Leave what you can in the lab & surface disinfect regularly.**
- **Limit the cycle of transmission: minimize contact and lab use. Wash hands frequently.**


# R&D Secure Bike Storage

Bikes are an example of a fomite.

Storage of bikes in research labs is not permitted.

R&D has provided secure bike storage between Buildings 8 and 34.

Contact Jacqui Wijelath (6.1238) or Kurt Strand (6.3188) for information or help with access.

# NIH Biosafety Policy Updates

1. Removal of the Funding Pause for Gain-of-Function(GOF) Research

NOT-OD-17-071

2. Revision of the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines)

NOT-OD-16-076

# Removal of the Funding Pause for Gain-of-Function(GOF) Research Projects - Update

On October 17, 2014, the U.S. Government announced that it would be instituting a funding pause on gain-of-function research projects that could be reasonably anticipated to confer attributes to influenza, MERS, or SARS viruses such that the resulting virus has enhanced pathogenicity and/or transmissibility (via the respiratory route) in mammals. During the funding pause, the U.S. Government undertook a deliberative process to assess the potential benefits and risks associated with these types of studies. Completion of the deliberative process resulted in the Department of Health and Human Services issuing the Department of Health & Human Services Framework for Guiding Funding Decisions about Proposed Research Involving Enhanced Potential Pandemic Pathogens (HHS P3CO Framework) on December 19, 2017.

**Update**: Doubts regarding the HHS P3CO Framework [a multidisciplinary, department-level pre-funding review and evaluation of proposed research meeting the scope of the framework] have recently been raised by the scientific community. Controversial experiments that could make bird flu more risky poised to resume:

https://www.sciencemag.org/news/2019/02/exclusive-controversial-experiments-make-bird-flu-more-risky-poised-resume

https://www.washingtonpost.com/opinions/the-us-is-funding-dangerous-experiments-it-doesnt-want-you-to-know-about/2019/02/27/5f60e934-38ae-11e9-a2cd-307b06d0257b_story.html?noredirect=on&utm_term=.bc0857465cc8

# Revision of the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines) to Streamline Review Process for Human Gene Transfer Protocols

NIH is proposing a series of actions to the *NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines)* to streamline oversight of human gene transfer research (HGT), and to focus the *NIH Guidelines* more specifically on biosafety issues associated with research involving recombinant or synthetic nucleic acid molecules. The field of HGT has recently experienced a series of advances that have resulted in the translation of research into clinical practice, including U.S. Food and Drug Administration (FDA) approvals for licensed products. Additionally, oversight mechanisms for ensuring HGT proceeds safely have sufficiently evolved to keep pace with new discoveries in this field.

1. Eliminate RAC review and reporting requirements to NIH for HGT protocols.

2. Modify roles and responsibilities of investigators, institutions, IBCs, the RAC, and NIH to be consistent with these goals including:

   a. Modifying roles of IBCs in reviewing HGT to be consistent with review of other covered research, and

   b. Eliminating references to the RAC, including its roles in HGT and biosafety.

https://www.federalregister.gov/documents/2018/08/17/2018-17760/national-institutes-of-health-nih-office-of-science-policy-osp-recombinant-or-synthetic-nucleic-acid

# For all Things Biosafety, Contact:

| | | |
|---|---|---|
| Jacqueline Murray-Wijelath, PhD, RBP. | R&D Biosafety Officer | Ext 6.1238 |
| Jennifer Jay, BS. | R&D Staff Assistant (RSS, IACUC, rDNA) | Ext 6.2669 |