Initial Clinic Safety Training

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Environmental Health & Safety (EH&S) Inspections

- Clinics are inspected semi-annually
- After inspection, Clinic Administrator receives a report with score & comments
- Inspection guidelines in safety manual (found in clinic blue book)

Inspection Process

- Comment sheet describes safety issues to be corrected
- Minimum passing score: 90%
- Re-inspection within:
  - 6 months
- Corrective action can be taken if safety infractions have not been addressed

EH&S Clinic Inspections

- Categories:
  - Signs & Labels
  - Blue Book
    - Clinical Safety Plan
    - Training
    - Awareness
  - Engineering Controls
  - Personal Protective Equipment
  - Work Practices
  - Waste Management/Sterilization & Disinfection
  - Vaccination/Testing
  - Emergency Procedures

Signs & Labels

Areas or equipment that could pose or contain a hazard
- Refrigerator
- May also require temperature log
- Centrifuge
- Eyewash Station
- Infectious Waste
- Sharps Containers
- Chemo Waste Containers
- Clean & Dirty Areas
- Biosafety Level (BSL) 2 Areas
- Chemical Containers
- Storage Areas

BSL2 Areas

- Areas where blood and Other Potentially Infectious Materials (OPIM) are manipulated must be labeled with a BSL2 sign, provided by EH&S.
- Must be posted at the entrance to the room
- The blanks must be filled in:
  - Building
  - Room number
  - Date posted
  - At least one general clinic phone number
  - At least one emergency phone number
Blue Book – Section 2

- Clinical Safety Plan: This is a physical description of the clinical area. It lists responsible parties, contact numbers. It also gives a general overview of Washington University (WU) policies and procedures.
  - Fill in the blanks
- Clinic-Specific Outline of Training
  - A generalized example of a Clinic-Specific outline of training is provided, however, it is only an example. The Clinic Administrator is responsible for creating the clinic-specific outline of training detailing important protocols and procedures pertinent to that clinical area.

Blue Book – Sections 3 & 4

- Provided by EH&S & Updated Annually:
  - Section 3:
    - Bloodborne Pathogens (BBP) Exposure Prevention Plan Core Policy
    - BJC Healthcare, Barnes-Jewish Hospital, Washington University School of Medicine (WUSM)
  - Section 4:
    - Tuberculosis Control Plan

Clinic Training Record

- Two types of training required annually:
  - Annual Clinic Safety Training
    - Provided by EH&S in a live class session or
    - Available online
  - Clinic-specific Safety training
    - Clinical Safety Plan
    - Any clinic-specific safety issues
    - Based on the Clinic-Specific Training Outline in Appendix 3 in the Blue Book
- All employees must sign Appendix 2 to document training
- Shipping training certificates for anyone shipping regulated/hazardous materials

Engineering Controls

- Eyewash stations
  - Eyewash stations are to be checked on a weekly basis with proper documentation
  - Available and unobstructed
  - Water temperature must be tepid

Sharps Containers

- Immediately available
- Wall-mounted or in a tip-proof frame
- Not over 2/3 full

Hazardous Chemicals

- Within secondary containment
- Stored below eye level
- On shelves with seismic protection
**Gas Cylinders**
- Secure properly – either chained or in cylinder cart or stand
- Do not drag, roll, strike
- Cap when empty or not in use

**Other Engineering Controls**
- 18” clearance below ceiling and sprinkler heads
- Blanket warmer at or below 130°F
- Medication cabinet locked
- Good housekeeping practices
- Sharps with safety features

**Sterilization**
- Autoclave use
  - Chemical indicator (color-change) tape verifies an item was exposed to sterilizing conditions
  - Does not indicate item is sterile
  - Biological indicators must be used daily
  - Proper documentation of these required tests is mandatory

**High-Level Disinfection**
- High-level chemical disinfectant
  - Glutaraldehyde alternatives should be used whenever possible
  - Follow manufacturer’s instructions for use and document any required tests
  - Nitrile gloves used with chemical disinfectant solutions
  - Use eye protection

**Vaccination and Testing**
- Annual tuberculosis (TB) testing – required for those who have direct contact with patients, human research participants, or non-human primates
- Hepatitis B virus vaccination offered upon hire to those working with human blood, OPIM, or cell lines
- Influenza vaccine offered annually to all employees

**BBP Training**
- Required by, and based on:
  - Occupational Safety & Health Administration (OSHA) Bloodborne Pathogens Standard
  - Can be accessed online
- Call with any questions! 362-6816
Bloodborne Pathogens Standard: The Regulations

- OSHA published *Occupational Exposure to Bloodborne Pathogens Standard* in 1991
- In 2000, the “Needlestick Safety and Prevention Act” mandated OSHA clarify/revise the *Standard*
  - Required use of safer needle devices
  - Required maintenance of a log of contaminated needlestick injuries

Information and Training

- Employees must receive initial bloodborne pathogens training when they are first assigned to tasks where occupational exposure to bloodborne pathogens may occur
- Employees must receive annual update training, and additional training when changes occur that affect the employees’ occupational exposure (such as change in job duties)
- This training must be provided at no cost to employees, and must take place during work hours
- This yearly training should be documented in the Blue Book

The Standard: Explanation of Contents

- Primarily aimed at workers in:
  - Hospitals
  - Funeral homes
  - Nursing homes
  - Clinics
  - Law enforcement agencies
  - Emergency response organizations
  - HIV/HBV research labs
- Also covers all employees who could "reasonably anticipate" facing contact with blood and other potentially infectious materials (OPIM) while performing job duties

Occupational Exposure

- Healthcare personnel and research workers are at risk for occupational exposure to bloodborne pathogens, including
  - Hepatitis B Virus (HBV)
  - Hepatitis C Virus (HCV)
  - Human Immunodeficiency Virus (HIV)

Transmission of Bloodborne Pathogens

- BBP can be transmitted when contaminated blood or OPIM enter the body of another person.
  - Puncture wound
  - Contact between non-intact skin and body fluids
  - Contact between mucous membranes and body fluids

What Is Non-Intact Skin?

- Exposed skin that is chapped, abraded or afflicted with dermatitis.
- This includes skin which has:
  - Open Sores
  - Cuts
  - Abrasions
Occupational Exposure

- Most exposures do not result in infection.
- Risk of infection varies with:
  - The pathogen involved
  - The type of exposure
  - The amount of blood or other potentially infectious material involved in the exposure
  - The amount of virus in the patient’s blood at the time of exposure

Washington University has an exposure reporting system in place to:
- Quickly evaluate the risk of infection
- Inform you about treatments available to help prevent infection
- Monitor you for side effects of treatments
- Determine if infection occurs
- This may involve testing your blood and that of the source patient and offering appropriate post-exposure treatment

Infectious Materials

- Any unfixed tissue or organ other than intact skin from a human (living or dead)
- HIV-containing cell or tissue cultures or organ cultures
- HIV or HBV-containing culture medium or other solutions
- Blood, organs or other tissues from experimental animals infected with HIV or HBV.

OPIM: Other Potentially Infectious Materials

- Semen
- Vaginal secretions
- Cerebrospinal fluid
- Synovial fluid
- Pleural fluid
- Pericardial fluid
- Peritoneal fluid
- Amniotic fluid
- Cell lines
- Saliva (during dental procedures)
- Any body fluid visibly contaminated with blood
- All body fluids in situations during which it is difficult or impossible to differentiate between body fluids

Patient Safety Considerations

“Recontact”/“Reverse” exposures

- It is important to immediately report blood borne pathogens exposure to a patient, so the patient can be treated, if needed.
- For example, a healthcare worker sustains an injury with a scalpel or suture needle and accidentally bleeds into the patient’s body cavity.
- Most of these exposures can be prevented by immediately replacing the contaminated suture needle or other sharp object before reuse.

The Infected Healthcare Worker

- WUSM believes that healthcare workers have an ethical obligation to report HIV, Hepatitis C, Hepatitis B infections to WUSM Occupational Health, so proper confidential testing and patient safety measures are enacted.
HIV

- HIV is the human immunodeficiency virus. It is the virus that can lead to acquired immune deficiency syndrome (AIDS).
- HIV damages a person’s body by destroying specific blood cells, called CD4+ T cells, which are crucial to helping the body fight diseases.

Symptoms of HIV

- Fever
- Lymphadenopathy
- Sweats
- Myalgia
- Rash
- Sore throat
- Risk of disease progression increases with duration of the infection.

HIV Worldwide

Global HIV/AIDS

- Today, an estimated 34 million people worldwide live with HIV/AIDS, with more than two-thirds living in developing countries. Nearly three-fourths of the 2.7 million new HIV infections in 2010 occurred in these countries.

  Data from US President’s Emergency Plan for Aids Relief (PEPFAR) Fiscal year 2011

HIV In Missouri

- The rate of newly diagnosed HIV cases was highest in St. Louis City (25.1 per 100,000).
- The second highest rate was in Kansas City (18.5 per 100,000).
- The rate of persons newly diagnosed who were classified as AIDS cases at the end of 2009 was highest in St. Louis City (10.7 per 100,000).
- Second highest in Kansas City (6.9 per 100,000).
- HIV disproportionately impacts St. Louis and Kansas City, which have the highest rates of new diagnoses and persons living with HIV disease, as well as the largest numbers of cases.

  Data from the Missouri Department of Health & Senior Services, 2009 Epidemiologic Profiles of HIV, STD, and Hepatitis in Missouri

Risk of Infection

- The average risk of HIV infection after needlestick or cut exposure to HIV–infected blood is 0.3%.
- The risk of exposure to the eye, nose, or mouth is estimated to be approximately 0.1%.
- The risk after exposure of non-intact skin to HIV–infected blood is estimated to be less than 0.1%.

  Data from Centers for Disease Control and Prevention. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HIV and recommendations for Postexposure Prophylaxis (PEP). MMWR 2005

HIV Protection

- There is no vaccine against HIV.
- Post-exposure prophylaxis (PEP) is recommended for certain occupational exposures that pose a risk of transmission.
- However, for those exposures without risk of HIV infection, PEP is not recommended because the drugs used to prevent infection may have serious side effects.
- Discuss the risk and side effects with your healthcare provider before starting PEP for HIV.
HIV Post-Exposure Prophylaxis

- Works best if begun within 2 hours of exposure.
- Typical HIV exposures: a basic 4-week, two-drug regimen is recommended.
- HIV exposures that pose an increased risk of transmission: a three-drug regimen may be recommended.
- Occupational exposures are considered urgent medical concerns.
- The PEP can reduce transmission risk by up to 81%!

Hepatitis B

HBV is a serious disease caused by a virus that attacks the liver. The virus, which is called hepatitis B virus can cause lifelong infection, cirrhosis (scarring) of the liver, liver cancer, liver failure, and death.

HBV

- In the US
  - In 2010, there were an estimated 38,000 new Hepatitis B virus infections
  - An estimated 800,000 to 1.4 million persons have chronic Hepatitis B virus infection
  - 3,000 die annually due to liver disease associated with Hepatitis B
- Globally, chronic Hepatitis B affects approximately 500 million people. 1 million of those who are infected die each year, primarily from cirrhosis or liver cancer resulting from their hepatitis B and hepatitis C infections
- Data from Centers for Disease Control’s “Hepatitis B FAQs for the Public”

HBV Signs/Symptoms

- Jaundice
- Fatigue
- Abdominal pain
- Loss of appetite
- Nausea, vomiting
- Joint pain

HBV Vaccine

- Employers are required to make the Hepatitis B vaccine available at no cost to employees who have occupational exposure to blood or body fluids.
- Employees who decline the vaccination must sign a statement indicating they understand their continued risk for Hepatitis B infection.

Can survive on environmental surfaces for at least 7 days!
**HBV Vaccine**

- 3 injections over a six month period
- Antibody titer drawn to check for response
- Revaccination is almost always effective in non responders
- Available through
  - Occupational Health (Medical School): 362-3528
  - Student Health (Danforth Campus): 935-6666

**Risk of Infection**

- People who have received the HBV vaccine and have developed immunity are at virtually no risk for infection after occupational exposure.
- For a susceptible person, the risk from a single needlestick or cut exposure to HBV-infected blood ranges from 6–30%.

**HBV Exposure Treatment**

Post-exposure treatment should begin as soon as possible after exposure, within 24 hours.

**Hepatitis C Virus (HCV)**

- Major cause of acute hepatitis, chronic liver disease (cirrhosis and liver cancer)
- An estimated 3.2 million persons in the United States have chronic HCV infection
- Each year there are an estimated 17,000 new HCV infections in the United States
- 80% of infected persons have NO symptoms
- Approximately 75%-85% of people who become infected with HCV develop chronic infection
  
  Data from Centers for Disease Control’s “Hepatitis C FAQs for the Public.”

**For the 20% who do have symptoms…**

- Jaundice
- Fatigue
- Dark urine
- Abdominal pain
- Loss of appetite
- Nausea
Risk of Infection

- Average risk for infection after a needlestick or cut exposure to HCV–infected blood is approximately 1.8%.
- The risk following a blood exposure to the eye, nose, or mouth is unknown but believed to be very small.
- However, HCV infection from blood splash to the eye has been reported.

Protection against HCV

There is no vaccine for HCV.
- Neither immune globulin nor antiviral therapy is recommended after exposure.
- For these reasons, following recommended infection control practices (Universal Precautions) to prevent exposure is imperative!

More Information

- For more information about HIV, HBV, and HCV, visit the Centers for Disease Control and Prevention websites:
  - HBV: http://www.cdc.gov/hepatitis/ChooseB.htm
  - HCV: http://www.cdc.gov/hepatitis/ChooseC.htm

What about unknown exposure sources?

- If the source individual cannot be identified or tested, decisions regarding follow-up should be based on the exposure risk and whether the source is likely to be infected with a bloodborne pathogen.
- Follow-up testing is available to all personnel who are concerned about possible infection from occupational exposure.

Exposure Control Plan

A written plan identifies the tasks, procedures, & job classifications where occupational exposure to blood occurs.

Exposure Control Plan

- One BBP Exposure Control Plan Core Policy for Washington University, Barnes Jewish Hospital, BJC Healthcare
- Reviewed and updated annually
- Available
  - In the EH&S “Blue Book”
  - In all clinics
  - Barnes Intranet
  - EH&S website ehs.wustl.edu
- All employees working with BBP are required to review it annually and document this in the Blue Book.
BBP Exposure Control Plan
Covers:

- Exposure determination
- Methods of compliance
- Vaccinations
- Post-exposure evaluation & follow-up
- Hazard communication
- Recordkeeping
- Policy enforcement
- Contracted employees
- Effective dates
- Treatment Procedure
- Job Classification Listing (for department)

- Potentially contaminated equipment
- Cleaning & sharps container changing schedule
- Compliance checklist
- Employee consent & waiver forms for HIV testing
- Body substance exposure lab documentation
- Standing orders
- Disease fact sheets
- Safety sharps evaluation checklist

Signs/Labels/Color-coding

- Signs & labels in the workplace communicate bloodborne pathogen hazards to employees.
- The warning label must include the universal biohazard symbol and the term “biohazard” in a color that contrasts with the fluorescent orange, red-orange background.
- Warning labels must be affixed to containers of regulated waste, refrigerators or freezers containing blood or OPIM, and other containers used to store, transport, or ship blood or OPIM.
- Red bags or red containers can be substituted for labels.
- Contaminated equipment which is to be serviced or shipped must also have a warning label and a statement regarding which portions of the equipment remain contaminated.

Bloodborne Pathogen Transmission

- Bloodborne Pathogens are not transmitted by:
  - Touching an infected person
  - Sneezing or coughing
  - Using the same equipment, materials, toilet, water fountain, or shower as an infected person

Prevention & Minimization of Bloodborne Pathogens Transmission

1) Universal Precautions
2) Engineering & Work Practice Controls
3) Personal Protective Equipment (PPE)
4) Appropriate Housekeeping Measures

Prevention

Many needlesticks and other cuts can be prevented by:

1. Using safer techniques
2. Disposing of used needles in appropriate sharps containers
3. Using medical devices with safety features designed to prevent injuries
4. Using appropriate barriers such as gloves, eye and face protection, or gowns when contact with blood or OPIM is expected.

Universal Precautions

- All blood and potentially infectious materials must be treated as if they are known to contain HIV, HBV, or other bloodborne pathogens.
Engineering Controls

- Engineering controls are preferred over work practice controls.
- Engineering controls are required when they will reduce employee exposure.
- Isolate or remove the hazard from the workplace.
- Examples include:
  - Sharps disposal containers
  - Self-sheathing needles
  - Safer medical devices

Needlestick Safety

- Two common engineering controls:
  - Needleless systems, or devices that do not use a needle for:
    - Collection of body fluids
    - Administration of medication/fluids
    - Any other procedure with potential percutaneous exposure to a contaminated sharp
  - Sharps with engineered sharps injury protection
    - Non-needle sharp or a needle with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident

Work Practice Controls

- Reduce the likelihood of exposure by altering the manner in which a task is performed.
- Examples include:
  - Prohibition of recapping needles
  - Hand washing

Hand Hygiene

- Simple & effective practice that prevents the transmission of bloodborne pathogens
- Stops the transfer of contamination from hands to other areas of the body, or to other surfaces

Hand Washing Guidelines

- Thoroughly wash hands or other exposed skin with soap & water as soon as possible following an occupational exposure to blood or OPIM
- Wash your hands with soap & water every time you remove your gloves
- If gloves are intact and you have had no occupational exposure to blood or OPIM, antiseptic hand cleaners may be used as appropriate hand hygiene
- Use soft, antimicrobial soap
- Avoid harsh, abrasive soaps as these may irritate skin

Nail Policy

- All staff who provide direct or indirect patient care or who have contact with patient care items:
  - Shall not wear artificial fingernails, gel fingernails, extenders, wraps or nail arts while at work
  - Should have clean and natural nails that are well manicured
  - Nail length should not extend past the end of the finger
  - If polish is worn, it should be well maintained and not chipped
### Mycobacterium Tuberculosis

- Human disease caused by a slow-growing bacterium that can affect the respiratory tract
- Transmitted by aerosols generated by coughing, sneezing, speaking and certain medical procedures
- Communicability dependent upon environmental, source patient and host factors

### Risk of Exposure

- To Decrease Risk:
  - All clinics must have N-95 respirators available
  - Early identification and isolation
  - Proper placement of patients
  - Proper use of N95 respirators – required for aerosol generating procedures
- Examples of Increased Risk Situations:
  - Performing aerosol generating procedures such as endotracheal intubation, bronchoscopy, sputum induction

### TB Patient Management

- Place patients in private room with negative pressure ventilation (NPV)
- Patient must wear surgical mask when leaving NPV room
- Staff caring for tuberculosis patients should be limited and required to wear N95 masks (not surgical masks)
  - respirator fit-testing is required
  - service provided by WUSM EH&S (362-6816)
- Minimize or avoid transport unless absolutely necessary. All testing should be done in patient’s room or postponed until non-infectious or ruled out

### Tuberculosis (TB)

- **TB infection vs. TB disease**
  - **TB Infection**: TB is present in the patient but they are not ill from it and are not infectious. (patient has positive skin test but no symptoms of infection and a negative chest x-ray)
  - **TB Disease**: TB is present and causing damage to the lungs or tissues (patient has symptoms and a positive or suspicious chest x-ray)
    - Can prevent development to TB disease with drug therapy
  - Can be treated with drug therapy, early diagnosis is crucial

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### Patient symptoms suspicious for tuberculosis:

- Weight loss
- Night sweats
- New cough (lasting longer than two weeks)
- Fever
- Bloody sputum

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TB Patient Management

- Communication is key: Always notify receiving facility/department of patient’s status (even if ruling out TB) prior to transport or referral.
- Attempt to schedule last case of day, do not transport until receiving area is ready for patient.
- Patients actively infectious for Mycobacterium tuberculosis should not be seen in the outpatient setting unless isolation needs (negative pressure room, at least 6 air exchanges per hour, HEPA filtration, etc) can be met.

If NPV is not available

- Patient must be placed in a private room, door closed.
- Do not allow patient to remain in waiting area.
- Instruct patient to wear surgical mask, if tolerated, to cover mouth with tissues when coughing or sneezing.
- Place wet towels at base of doors (in the operating room).
- Staff must wear N95 respirators.
- Door must be kept closed after patient leaves room for a minimum of 1 hour.
- Clean and disinfect same as any room, use hospital approved disinfectant.

Tuberculosis Control at WUMC

- Screening:
  - Contact Occupational Health on Medical School Campus • 362-3528
  - Contact Student Health on Danforth Campus • 935-6666
- Report to Occupational Health if you have symptoms.
- Employees with positive TB skin tests must follow up with Occupational Health.
- Report any suspect patient cases to Infection Control.

Personal Protective Equipment

- Select PPE based on:
  - Route(s) of exposure
    - Inhalation
    - Ingestion
    - Absorption (skin/eyes)
    - Injection
  - Task
- Keep in convenient location.
- Replace immediately upon visible contamination or damage.
- Call EH&S (382-6816) for assistance in selecting PPE.

Gloves

- Latex is best for potentially infectious materials however it is a poor chemical barrier.
- Nitrile or vinyl are also acceptable, especially for those with latex allergies or sensitivities.
- Latex gloves are not allowed in Children’s Hospital.
- All gloves are not suitable for all tasks, especially when working with chemicals.
  - Nitrile gloves for chemical use - Cidex, Metricide, Wavicide, etc.
- Double gloves add another layer of protection.
### Gloves
- Always inspect gloves before putting them on
- Remove contaminated gloves carefully, and dispose of them appropriately
- Do not reuse disposable gloves
- Non-disposable gloves can be decontaminated for reuse if intact and no signs of deterioration
- Wash hands immediately after removing gloves (required)

### Eye Protection
- Bloodborne pathogens can be transmitted through the mucous membranes of the eye
- Use eye protection whenever there is a risk of splashing or vaporization of contaminated fluid
  - Cleaning up spills
  - Certain clinical procedures

### Masks and Face Shields
- Provide an additional layer of protection for tasks that may generate splashes, spray, spatter, or droplets of blood or OPIM
- When eye, nose, or mouth contamination can be anticipated
- Eye protection must also be worn with face shields

### Respirators & Face Masks
- Use engineering controls instead when possible
- Contact EH&S if using any type of respirator or face mask
- Medical evaluation, fit test required for the use of N95 respirators

### Other Protective Body Clothing
- Appropriate protective clothing shall be worn in occupational exposure situations.
- Closed toe shoes are required
- Type and characteristics will depend upon the task and degree of exposure anticipated.
- Examples:
  - Gown
  - Apron
  - Lab Coat

### General Guidelines for Use of PPE
- You must be trained to use the PPE properly!
- PPE should be appropriate for the tasks and must fit properly
- PPE should be free from physical flaws that could compromise safety
- Use appropriate PPE each time you perform a task involving potentially infectious materials
- Your employer will issue the PPE and make it readily available in the work area
General guidelines for use of PPE

- Remove all PPE prior to leaving the work area.
- Place contaminated PPE in an appropriately designed area or container for storage, washing, decontamination or disposal.
- Remove garments such as lab coats/aprons that are penetrated by blood or OPIM immediately or as soon as feasible.

Appropriate housekeeping measures

- Using a hospital approved disinfectant, clean & decontaminate all equipment & working surfaces after contact with blood or OPIM.
- Contaminated work surfaces, such as counters and exam tables, should be decontaminated with an appropriate disinfectant:
  - After completing procedures.
  - Immediately if they are heavily contaminated or if there has been a spill.
  - After each patient.
  - Clean linen kept covered.

Handling & disposal of broken glassware

- Do not pick up broken glass directly with your hands! Use a brush and dust pan, tongs or forceps.
- Disinfect broken glassware that has been visibly contaminated with blood with an approved disinfectant solution before disturbing it or cleaning it up.
- Dispose of contaminated glassware in an appropriate sharps container. Sharps containers should be closable, puncture-resistant, leak-proof on sides and bottom, and appropriately labeled.
- Dispose of uncontaminated glassware in a labeled, closeable, puncture-resistant container, such as a lined cardboard box.

Small biohazard spill cleanup

- Wear gloves and other appropriate PPE
  - Protective eyewear, lab coats, masks, and face shields if splashing is likely.
- Safely remove any broken glass (see previous slide).
- Cover spill with paper towels and carefully pour disinfectant around and on the spill.
  - 1:10 dilution of household bleach.
  - Take care not to splash disinfectant solution or create aerosols while pouring.
- Remove paper towels, repeat until all visible material is removed.
- Re-wet cleaned area with disinfectant. Air dry or let stand for 10 minutes before wiping dry.
- Place all contaminated paper towels in a biohazard bag for appropriate disposal.
- Remove all PPE and immediately wash hands.

Large biohazard spill cleanup

- Alert co-workers to leave area immediately.
- Close door, post "Do Not Enter" sign.
- Remove contaminated garments and put into dirty linen or biohazard waste container.
- Wash hands/face with soap.
- Notify supervisor.
**Large Biohazard Spill Cleanup**

- Wait at least 30 minutes before re-entry (to allow aerosols to dissipate)
- Upon re-entry, wear appropriate PPE
  - Disposable gown
  - Mask
  - Gloves
  - Shoe covers (booties)

- Carefully pour disinfectant (1:10 dilution of household bleach) around spill, then cover with disinfectant-soaked paper towels
- Let stand for at least 20 minutes
- Transfer all contaminated materials into a biohazard bag
- Wash and mop entire area with appropriate disinfectant
- Remove & discard PPE
- Wash hands/face with soap

**Cytotoxic Spill Response**

- Follow instructions found in clinic-specific training
- In general, same as for biohazard spills except:
  - Use nitrile or other chemical-resistant gloves (not latex)
  - Use detergent and water instead of 1:10 dilution of bleach
  - Place waste in chemo waste containers rather than biohazard waste containers

**Radioactive Isotope Spills**

- For Radioactive Isotope Spills, contact:
  - Radiation Safety
    - 362-3479 (office)
    - 299-1322 (cell)
  - Security for your building:
    - Barnes Security - 362-0911
    - WU Protective Services - 362-4357

**Hazardous Material Spills**

- Secure & evacuate area
- Report
  - Danforth Campus Police: 935-5555
  - WU Protective Services: 2-HELP (362-4357)
  - Barnes Security: 362-0911
  - Chemical & Biological: 2-HELP (362-4357)
  - Radiological: 299-1322
- EH&S will remediate
- Follow proper procedures if exposure occurs

**Handling Contaminated Laundry**

- Handle soiled linen as little as possible and with minimum agitations, to prevent exposure to the handler
- When handling dirty linen, the appropriate PPE should be worn
- Soiled linen should be stored in a closed hamper or soiled linen bag
- Handling dirty linen is one of the top 5 sources of needlestick injuries (OSHA)
Chemical Waste Management

- Hazardous chemicals, expired medications and supplies must be disposed of properly.
- Areas outside of the Medical School complex follow different regulations and procedures from areas within the complex. These offsite areas should call 314-362-6930 for specific instructions for disposing hazardous materials.

On Site Chemical Waste Management

- Hazardous waste label applied to container
- Include:
  - Description (no acronyms or abbreviations)
  - PI and location
  - Start date: Month/Day/Year
- Send Request For Pickup to EH&S when filled or <1 year
- Segregate by hazard class
- Store using secondary containment (cabinet/tray)

On Site Chemical Waste Disposal

- When the waste container is 2/3 full or within 11 months of starting this particular waste stream a chemical request for pick-up (RFP) must be submitted
  - Form required by law
  - Must be filled out completely
  - Submitted electronically
    - Select "Waste Pick-up Request Forms" on EH&S webpage (ehs.wustl.edu)

Hazardous Waste: Other Products

- Non-Alkaline batteries
- Computers, circuit boards, monitors
- Ultraviolet (UV) germicidal lamps
- Fluorescent and high intensity discharge (HID) lamps
- Mercury containing products
- Refrigerators
- Centrifuges
- Cleaning materials from biological or chemical spills

Surplus Equipment Labels

On-Site Clinics Only

- Any equipment containing chemical or biological hazards must be disposed of properly.
- A surplus equipment label is required on all equipment awaiting pickup for recycling or disposal
- Submit request for pickup on the EH&S webpage (ehs.wustl.edu)
  - Select "Waste Pick-up Request Forms"

Regulated Biological Waste

- Regulated Biological Waste is defined by law as a waste capable of producing an infectious disease because it contains pathogens of sufficient virulence and quantity so that exposure to the waste by a susceptible human host could result in an infectious disease.
- You may hear terms such as "medical waste," "biohazardous waste," "pathological waste," or "infectious waste". Environmental Health & Safety (EH&S) treats all of these types of waste as Regulated Biological Waste.
Regulated Biological Waste must be packaged as described below

- Prior to disposal through EH&S, all Regulated Biological Waste must be separated into two waste streams. These streams must be packaged separately.
  - Waste that must be incinerated: When packaging this material the word "Incineration" must be written on the container. These wastes include:
    - Trace chemotherapy contaminated waste (RCRA empty drug vials, syringes and needles, spill kits, tubing and bags, contaminated gloves and gowns)
    - Human or animal parts, organs, tissues and surgical specimens (decanted of formaldehyde).
    - Pharmaceuticals that are not regulated under RCRA or are not DEA Controlled Substances. See Pharmaceutical Drug Guidelines.
    - Any material required to be incinerated as a condition of a CDC, USDA, Fish & Wildlife, or other agency permit
  - All other Regulated Biological Waste can be autoclaved.
    - This includes human and animal blood and blood products.
    - Cells may be autoclaved.

Regulated Biological Waste must be packaged appropriately

- All Regulated Biological Waste must be packaged in the containers and inner red bags that are provided by the vendor or EH&S.
  - These containers are clearly marked with the universal biohazard symbol displayed and labeled, "infectious waste" or "biohazard waste".
  - The boxes must be right side up, look for the "this end up" marking.
  - The bottom of the box must be taped using the tape provided by EH&S.
  - There must be an inner red liner inside the container.
  - These containers must weigh no more than forty (40) pounds.
  - When full, boxes must be taped shut using the tape provided by EH&S. Other containers should be kept securely closed at all times.

For DOT compliance, there are two ways to properly secure the red bags that contain biological waste.

- Method 1 (Preferred) - twist and tie the red bag in a single knot.
- Method 2 - twist and fold twisted part over. Wrap tape around neck for at least 3 revolutions

Sharps

- If your waste contains sharps then the container they are placed in must be a rigid, leak proof, puncture resistant, sealable container.
- EH&S does not provide sharps containers.
- Do not use glass containers for sharp containers.

Sharps Containers

- Do Not Overfill or Compress Container

Manifests or Shipping Papers

- Do not sign a manifest or shipping papers unless you have completed “EHS - DOT Regulated Biological Waste for Shipment”
  - Available through Learn@Work (https://learnatwork.wustl.edu)
Disposal Procedures

- Submit an on-line request for pick-up form on the Environmental Health and Safety website at: http://ehs.wustl.edu
- If your clinic generates Regulated Biological Waste on a continual basis that is more than three (3) boxes per week, contact EH&S at 362-6735 to arrange a weekly pick up.
- These clinics will be provided with a sticker to label their Regulated Biological Waste boxes as theirs to ensure accurate billing.
- The charge from Environmental Health and Safety will be 28 cents per pound for infectious waste that can be autoclaved and 53 cents for infectious waste that must be incinerated.

Regulated Waste Containers

- Infectious Waste Containers
- Chemotherapy Waste Container

Radioactive Waste

- See Radiation Safety Guidelines
  - http://radsafety.wustl.edu
  - radsafety@wustl.edu
  - 362-3476

Transporting Samples Outside the Clinic

- Transport samples of hazardous or infectious materials in outer safety containers or leak/shatter-proof carriers

DOT Security Awareness

- The most likely terrorist threats are external; a careful employee background check and verification of information provided on an employment application can be an effective deterrent to the insider threat.
- Terrorists do not all fit a preconceived picture of a criminal.
- If questioned about hazardous materials, you must know who is asking and why they have a need to know, to provide answers.

DOT Security Awareness

- Many materials classified as “hazardous” are essential products to industry, but can be used as weapons.
- Do not discuss with strangers your load or destination when transporting hazardous materials.
- Mixtures containing hazardous materials can be detonated/ignite to cause a powerful explosion.
DOT Security Awareness

- To increase security of hazardous materials in transportation, lock all doors of the vehicle.
- Commonplace equipment like scanners and color printers can be used to forge personal identification such as a driver’s license, certifications, and passports.
- Hazardous materials are most vulnerable when in transit.

Emergency Procedures

- Employees must be aware of the following procedures:
  - Where to evacuate in case of fire
  - How to use a fire extinguisher
  - Proper procedure if an earthquake, tornado, hazardous spill, or injury
  - Who to call in case of emergency
- Emergency phone numbers must be posted by the telephone

Fire Marshal Requirements

- Hazardous materials inventories required for all clinics, laboratories, shops, custodial and mechanical rooms
  - Chemical tracking database free for WU Departments
    - [https://ehsaweb.wusm.wustl.edu/](https://ehsaweb.wusm.wustl.edu/)
- Egress corridors free of equipment and combustible materials
- Fire doors may not be propped open

Fire Extinguisher

- Class ABC extinguishers are located throughout campus
- Inspected Monthly
- Serviced Annually

Small Fire Procedures

- Class ABC extinguishers are located throughout campus
- Inspected Monthly
- Serviced Annually

PULL the pin
AIM at the base of the fire
SQUEEZE the handle
SWEEP from side to side
Small Fire Procedures

- Ask someone to call Protective Services or Security while you obtain an extinguisher.
- Use the PASS method for extinguishing the small fire.
- If fire cannot be handled with one extinguisher, follow procedures for a large fire.

Things to Remember...

- Most fire extinguishers are exhausted in less than one minute
- Always keep an exit at your back
- Always hold the extinguisher upright

Large Fire Procedures – R.A.C.E.

R - RESCUE Move patients and assist visitors or impaired employees away from immediate danger of fire or smoke IF YOU CAN DO THIS WITHOUT PUTTING YOURSELF IN IMMEDIATE DANGER

A - ALARM Activate the nearest alarm. Once you are at your evacuation point, call:
- WU Protective Services: 362-HELP (2-4357)
- Barnes Security: 2-0911
- Danforth Campus: 5-5555
- ONLY off-site clinics should call 911

C - CONTAIN Close all doors and windows

E - EVACUATE Proceed to your designated evacuation

Tornado Safety

- Staff without current patient care responsibilities
- Before a Tornado
  - Develop a calling tree
  - Keep a flashlight and battery-operated radio on hand
- During a Tornado
  - Evacuate to an inside hallway at the lowest level with a flashlight and radio, get under heavy furniture.
- After a Tornado
  - Help injured / trapped persons
  - Use phone for emergency only
  - Leave building if you smell gas or chemical fumes
  - Notify the Authorities
    - School of Medicine Campus: 362-4357 (2-HELP)
    - Danforth Campus: 935-5555
    - Barnes Buildings: 362-0911

Earthquake Safety

- Before an Earthquake
  - Identify items in your area likely to fall or break and secure them
- During an Earthquake
  - If indoors, stay under a sturdy table or desk until shaking stops
- After an Earthquake
  - Move to outside designated assembly area
  - Be prepared for aftershocks
  - Check for injuries in your area
  - Place all telephone receivers back on the telephones
  - Tune in to radio for instruction
    - (KMOX AM 1120)
Know “Where to Go” in an Emergency

- Visit http://emergency.wustl.edu
- Emergency hotlines
  - Call to hear recorded emergency updates
  - University Announcements
    - 935-5000 or 888-234-2863
  - Hospital Bulletins
    - 362-5056

Injury Procedures

- Life Threatening
- Non-Life Threatening
- Skin Exposure
- Needlestick and Puncture Wounds
- Eye Exposures

Sharps Injury

According to the Occupational Safety and Health Administration (OSHA), US Department of Labor, most needlestick injuries occur during the following five activities:
- When disposing of needles
- When administering injections
- When drawing blood
- When recapping needles (not allowed)
- While handling trash and dirty linens

Exposure Incidents

- Even the most comprehensive infection control program cannot guarantee that accidental exposures to bloodborne pathogens will not occur.
- Human error or an unexpected circumstance can result in a sudden needlestick injury or a splash of blood in an employee’s eye.
- Post-exposure management must be an integral component of a complete program to prevent infection following bloodborne pathogen exposure.

Exposure Incidents

- Considered an urgent medical concern
- Ensure timely post-exposure management
- Administration of Hepatitis B Immune Globulin (HBIG) or HIV PEP
- Early treatment can significantly reduce the chance of disease transmission!
In Case of Exposure

- Any blood or body fluid exposure, including sharps injuries:
  - Immediately STOP working!
  - Wash needlesticks and cuts with soap and water
  - Flush splashes to the nose, mouth, or skin with water
  - Irrigate eyes with clean water, saline or sterile irrigants
- No scientific evidence shows that using antiseptics or squeezing the wound will reduce the risk of transmission of a bloodborne pathogen
  - Using a caustic agent such as bleach is not recommended

In Case of Exposure cont.

- Contact immediately:
  - Infectious Disease 24–hr Hotline
    - Medical School: 747–3535
    - Danforth: 1–877–767–8397
  - Occupational Health (Medical School):
    - 362–3528
  - Student Health (Danforth): 935–6666
- Notify your supervisor
- Complete a Report of Injury or Illness (available in the Blue Book or at ehs.wustl.edu)

Life Threatening Injury or Illness

- Contact BJH Security (362–0911) or WUSM Protective Services (362–HELP), Student Health (935–6666), or Danforth Campus Police (935–5555).
- Employee will be transported to Barnes Emergency Department
- A Completed Report of Injury or Illness form should be sent to the Workers’ Compensation office

Non–Life Threatening Injury/Illness

- Contact BJH Security (362–0911), WUSM Protective Services (362–4357), Student Health (935–6666) or Danforth Campus Police (935–5555), who will provide transportation to Barnes Care
  - After-hours employee will be transported to the Barnes Emergency Department
- WU Workers’ Compensation office should be contacted for approval to treat the employee
  - 935–5547
- A Report of Injury or Illness form should be completed and sent with the employee
  - available in the Blue Book or at ehs.wustl.edu

Chemical Exposure (Skin)

- Immediately flush the affected area continuously with water for 15 minutes
- During this time contact BJH Security, WUSM Protective Services, Student Health or Danforth Campus Police
  - They will arrange transport to Barnes Care or the Emergency Room
  - Have them contact EH&S so that a MSDS can be sent to the treatment facility
- Contact the Workers’ Compensation Office for permission to treat the employee

Needlestick/Puncture Wound

- Immediately wash the affected area with soap and water
- Contact the Infectious Disease Division right away.
  - Prophylaxis for HIV is best when given within 2 hours of the exposure.
    - WUSM: Call Infectious Disease Hotline 747–3535
    - Danforth: Call the BJ Post Exposure Hotline: 1–877–767–8397
- Follow the prompts for Washington University employees
- A Completed Report of Injury or Illness form should be sent to the Workers’ Compensation office
Eye Exposure/Injury

- Chemical/drug exposures to the eye should be flushed with water for 15 minutes
  - Have a coworker locate the Safety Data Sheet (SDS) for the chemical/drug involved to reference during treatment
  - If no SDS is available, contact EH&S for assistance
- Call for escort to the Emergency Department:
  - Barnes Security: 2-0911
  - WUSM Protective Services: 2-HELP (2-4357)
  - Danforth Campus Police: 5-5555
  - Student Health: 5-6666

Eye Exposure/Injury cont.

- Blood or body fluid splashes to mucous membranes should be flushed with water or normal saline. Follow instructions for needlestick injuries.
- Call the Workers’ Compensation Office at 935-5547 for permission to treat the employee and complete a Report of Injury or Illness form

Ergonomics

- Ergonomics is the science of fitting jobs to people
- Poor ergonomics may lead to pain, numbness or other muscular or neurological symptoms
- Causes
  - Repetitive motion
  - Forceful exertion
  - Awkward positions or movements
  - Vibration
- Visit ehs.wustl.edu for an ergonomic self-evaluation

Ergonomics – Lifting

- Practice Safe Lifting Techniques
  - Stand close to the object
  - Spread your feet wide
  - Squat, bending knees and hips
  - Keep head up and back aligned
  - Contract your stomach muscles
  - Lift using your legs
  - Don’t be afraid to ask for help

Slips, Trips and Falls

- Pay attention on stairs, uneven surfaces
- Close drawers
- No extension cords over walking surfaces
- Clean up spills
- Report unsafe conditions
  - Loose carpet, stair treads, floor tiles
  - Spilled materials, wet floors

Electrical Safety

- Safe Work Practices
  - Energized equipment:
    - Only qualified electrical personnel shall design, modify, test, repair or perform maintenance on “live” energized electrical equipment.
  - Altering wiring and utilities:
    - Any modifications to existing electrical service in a laboratory or building must be approved through a work order and completed by qualified personnel.
- Failure to follow safe practices may result in severe injury
Extension Cords

• Extension cords are not allowed in the clinic for permanent use.
• Electrical power surge protectors are allowed only for personal computers and their components.
• Inspect power cords to be sure they are not frayed or have exposed wiring.
• Carefully place power cords so they don’t come in contact with water or chemicals.
• Do not lift a piece of electrical equipment by the cord or pull the cord to disconnect from the outlet in order to prevent damage.

Asbestos Awareness

• Contact Facilities or EH&S prior to any remodeling or repair of labs, or if lab bench tops or floor tiles are damaged
  – Asbestos Containing Material (ACM) is most common in older buildings and can be present in some lab bench tops, floor tiles, mastic (glue), caulk, behind walls.
  – Regulated ACM includes damaged ACM, such as ACM pipe wrap damaged by flood, or floor tile or bench top mechanically crushed
  – ACM is not a hazard if in good shape

Shipping Hazardous Materials

• Training required prior to shipping:
  – Patient specimens (blood, saliva, urine, etc.)
  – Infectious or Biological Materials
  – Dry ice
  – Any “Dangerous Goods”
• Contact EH&S for training, 362-6816
  – Offered at least monthly
  – Registration available online
• DO NOT complete a Shipper’s Declaration unless you have been trained - contact EH&S for assistance

University shipping training does not cover chemical shipments
• EH&S provides all chemical shipping services for the university
  – This includes biological samples preserved in chemical solution
• Complete a chemical shipment request online: ehs.wustl.edu
• Never fill out a Shipper’s Declaration for dangerous goods
  – If requested by FedEx, call EH&S!

Good Practice:
Basic Requirements

• Think safety first
• Do not eat or store food in areas where toxic, infectious, or radioactive materials are used or stored
• Follow all safety procedures and wear appropriate PPE
• Practice good housekeeping
• Clean linen stored covered
• Eliminate mercury-containing items
• Recapping needles is prohibited
• Use sharps safety features

Institutional Biosafety Committee (IBC)

• IBC approval is required for clinical trials involving administration of:
  – Recombinant DNA (e.g. plasmid vaccine)
  – Genetically-modified cells
  – Live microorganisms (other than vaccines directed against infectious diseases)
• Contact ehsibc@wusm.wustl.edu if you are uncertain whether or not you need IBC approval for your clinical trial
Radiation Safety

- Radiation Safety inspections are separate from Laboratory/Clinical/Occupational Safety inspections
- Additional training through Radiation Safety is required
- Website: http://radsafety.wustl.edu
- Phone: 362-3476

Infection Prevention Contact Information

- Carol Sykora, Infection Prevention Specialist
  - Office # 747-9676
  - Pager # 360-4948
- IC department secretary: 454-7560
- IC emergency beeper (after hours and weekend emergencies): 424-4380

Contacting EH&S

- Web: http://ehs.wustl.edu
- Phone: 362-6816
- Email: ehs@wustl.edu
- Fax: 362-1995