

PREVENTION

The course presenter has chosen to replace PowerPoint note pages with this handout. Please use it to prepare for competency evaluation.

1. Work-associated risks
 - a. Splash mucous membranes (eyes, nose, mouth)
 - i. Permeable membrane – microbes can move through
 - b. Contaminated sharp objects (needles, broken glass)
 - c. Exposure of non-intact skin (wounds, rashes)
2. Contamination sources
 - a. Direct handling or contact with **Human blood or OPIM**
 - b. Equipment, supplies or tools contaminated with blood or OPIM (surface, bedding)
 - c. Removed tissues or organ contaminated with blood or OPIM (amputation)
 - d. Cultures containing bloodborne pathogens (urine, sputum)
3. Standard precautions
 - a. Formerly universal precautions
 - b. Assumes ALL blood or OPIM is infectious
 - c. Defines three adaptations to the work environment to prevent spread of BBPs
 - i. Engineering controls – equipment, instruments, devices created to prevent exposure
 1. Examples: Safety needles, hands-free tools, leak-proof containers
 - ii. Safe work practices – Practices that reduce risk of exposure
 1. No eating, drinking, applying makeup or smoking in areas where blood or OPIM are a risk – touch face subconsciously
 2. Correct personal and hand hygiene
 - a. Personal hygiene
 - i. Clean vs. contaminated:
 1. Highly contaminated – 100,000 microbes (toilet, bottom of shoes)
 2. Contaminated – 10,000 microbes (surface not cleaned in over 24 hours)
 3. Clean – 100 microbes – Disinfected surface (microbes move/fall off above surface)
 4. Sterile – microbe free – Autoclave (250 degrees)/chemical sterilizer for 15 minutes
 - ii. YOU fall into one of first three categories based on own personal hygiene
 - iii. YOU can increase infection rates by practicing poor hygiene
 - iv. Daily hygiene necessary to reduced risk
 - v. Includes teeth, hair, body, shoes, uniform, etc.
 - b. Hand hygiene
 - i. Soap & water:
 1. 15 seconds of RUBBING (add time for wetting/rinsing)

2. Dry paper towel to turn off faucet (microbes move through wet materials)
 3. Areas often missed: Under nails, around the nail, in the creases of knuckles, up the wrists, in the creases of the palms of the hands, under rings or watches
 4. Often bypassed due to things like inconvenient sink locations and unwillingness to pause for time necessary to wash
 - ii. Antibacterial gel/foam:
 1. NOT when hands visibly contaminated
 2. Rub on all hand surfaces until dry
 3. At least 60% alcohol
 4. Remember 'anti-bacterial'
 5. NOT anti-viral, anti-fungal or anti-protozoan
 6. Soap and water after three applications
3. Cough etiquette
 - a. Cough speed 40-100 mph
 - b. Three feet circle?
 - c. Tissue over mouth (& nose) or cough into shoulder
 - d. If cough into hands, wash thoroughly and at once
 4. Plan before doing
 - a. No 'auto pilot'
 - b. Think of each step
 - c. No rushing!
 - d. Includes clean up (e.g. broken glass – broom/dustpan not hands!)
 5. Care of environment
 - a. Florence Nightingale
 - i. Crimean War – team of nurses
 - ii. Dirty hospital (and workers) – linen, tools, general environment
 - iii. Infection rates 90%; death rate 50%
 - iv. Cleaning, disinfection, hand hygiene reduced infection rates to what we see today
 - b. Microbes can move across a surface, can be blown onto a surface and can 'aerosolize'
 - c. Level of contamination influenced by:
 - i. # of people (more, greater risk)
 - ii. Amount of activity (more, greater risk?)
 - iii. Air circulation (less, greater risk)
 1. Microbes in air vents
 - iv. Amount of moisture (more, greater risk)
 - v. Presence of materials that promote microbial growth (more, greater risk)

- vi. Orientation of surface (horizontal greater risk than vertical)
- d. Disinfectants:
 - i. Many lists of disinfectants based on type of work environment.
 - ii. Disinfectants are not equal!
 - iii. Type of solution to use for bloodborne pathogen contamination:
 - iv. Medical grade chemicals (Chlorhexidine; Cavicide)
 - v. Fresh 10:1 water to bleach solution
 - vi. NOT alcohol – dries too fast
 - vii. Employer should have list of areas to be cleaned, interval of cleaning and who is assigned to clean
 - viii. Follow manufacturer instructions for contact time!
- 6. Hepatitis B vaccination
 - a. Occupational infection rates have dropped 95% since the vaccine became standard (1982)
 - b. Three dose series
 - i. Initial dose – w/in 10 days of hire
 - ii. One month after initial dose
 - iii. Six months after initial dose – employer responsible for tracking and assuring third dose
 - c. Booster not required
 - i. Check immunity if exposed (blood test)
 - ii. May give additional hep B vaccine or medication that stimulates immune system
 - d. Can decline (assume liability) – but can also change mind
 - i. If you decline/assume liability: Workman’s comp won’t cover you and employer has no obligation to pay for care or leave position open while you recover from exposure...
 - e. No cost to employee
- 7. Proper handling of biological waste
 - a. Biohazard: *A biological agent or condition that is a hazard to humans or the environment* (Merriam-Webster online)
 - b. Includes handling, disposing of, labeling, transporting
 - c. Sources:
 - i. Human (or animal) blood
 - ii. Human (or animal) OPIM
 - iii. Infected human waste
 - iv. Used sharps
 - 1. Sharp safety:
 - a. Sharp: Any instrument or device that can cut or puncture skin
 - b. Medical: Needles, scalpals, etc.

- c. Non-medical: Glass, razors, metal, wires, etc.
 - d. Place needles directly into a sharps container
 - e. Place ANY sharp in a rigid, puncture proof container
 - f. Never allow hand to enter 'dip' opening
 - g. Replace sharps container when $\frac{3}{4}$ full
 - h. DON'T overfill
 - i. Never attempt to re-open a closed sharps container
 - j. Avoid recapping – if you must, use a cap holder or the scoop method and use one hand!
- v. Working with laboratory/clinical waste contaminated with blood, tissues, cells or OPIM:
- 1. Wear appropriate personal protective equipment when handling biological waste
 - 2. Infectious or pathogenic waste must be labeled and held in a closed/covered leak-proof container & may not be stored > than 24 hrs before moving from public or clinical areas
 - 3. Double bag if outside of first bag is contaminated
 - 4. Medical sharps in labeled sharps container: Rigid, leakproof, closeable
 - 5. Do not put liquids into biohazard bags (IV bag, soda, etc.)
 - 6. Biohazard may be stored onsite for up to 30 days if the storage area is locked, kept tidy and labeled as a biohazard storage area
 - 7. Do not mix biohazard with other types of waste
 - 8. Radioactive
 - 9. Chemical
 - 10. Drugs
 - 11. Regular Trash?
 - 12. No red bags
 - 13. No sharps boxes
 - 14. Nothing with a biohazard warning label
 - 15. Laws about transport of biohazard – know them before transporting (Transportation Department)
- iii. Personal protective equipment (PPE)
- 1. Includes:
 - a. Gloves
 - b. Body coverings

- c. Mouth, nose, eye protection
 - d. Ventilation device (mouthpiece)
 - e. Footwear
2. Employer responsibilities regarding PPE
- a. ANY setting where there is a risk of exposure to blood or OPIM
 - b. Supplied by employer – even individual needs
 - c. Must:
 - i. Be stored in a clean, dry area
 - ii. Be available (informed employees)
 - iii. Fit
 - iv. Be appropriate for the task
 - v. Cleaned or disposed of properly
3. Gloves
- a. Know your size before needing
 - b. Medical grade for biohazard (not utility)
 - c. Single use, disposable
 - d. Application easy – inspect for holes/damage
 - e. Removal of contaminated gloves:
 - i. Grab OUTSIDE of the first glove at wrist and pull off
 - ii. Place that glove in the palm of the gloved hand.
 - iii. Push fingers INSIDE cuff of second glove and pull off and over other glove
 - iv. Dispose in biohazard container
 - v. Wash hands immediately
 - f. Public perception: ALL gloves are contaminated
 - g. OSHA on gloves:
 - i. *Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and non-intact skin; when performing vascular access procedures except as specified in paragraph (d)(3)(ix)(D); and when handling or touching contaminated items or surfaces (OSHA BBP standard).*
 - ii. *Disposable (single use) gloves such as surgical or examination gloves, shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised.*
 - iii. *Disposable (single use) gloves shall not be washed or decontaminated for re-use.*
 - h. Latex allergy
 - i. Becoming more common
 - ii. Repeated exposure to latex
 - iii. Symptoms start mild – skin irritation

- iv. Progress over time to mild allergy symptoms: Hives, runny nose, itchy eyes or nose, irritated throat
 - v. Anaphylactic shock possible
 - vi. Options:
 - 1. To avoid development of an allergy, wear gloves only when needed
 - 2. Nitrile or vinyl gloves
 - vii. OSHA on allergies: *The employer shall ensure that appropriate personal protective equipment in the appropriate sizes is readily accessible at the worksite or is issued to employees. Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to those employees who are allergic to the gloves normally provided.*
4. Body coverings
- a. Gowns, aprons, hair covers, shoe covers, etc.
 - b. Disposable – single use
 - c. Moisture resistant – NOT proof
 - d. OSHA on gowns: **Gowns, Aprons, and Other Protective Body Clothing**. *Appropriate protective clothing such as, but not limited to, gowns, aprons, lab coats, clinic jackets, or similar outer garments shall be worn in occupational exposure situations. The type and characteristics will depend upon the task and degree of exposure anticipated*
5. Masks & eyewear
- a. Protect eyes, nose, mouth
 - b. Masks:
 - i. Various types of masks – standard, face shield type, type with very small pores (N-95 respirator)
 - ii. Tie masks or masks with loop around ears
 - iii. Contaminated when wet
 - c. Goggles are cleansed between use
 - d. OSHA on masks and eyewear: **Masks, Eye Protection, and Face Shields**. *Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin-length face shields, shall be worn whenever splashes, spray, spatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated.*
6. ALL PPE:
- a. Outside contaminated
 - b. Inside not contaminated UNLESS wet
7. Isolation room/Isolation precautions
- a. Transmission-based precaution for infections requiring special procedures to prevent exposure
 - b. Example of EMS breach of standard – MRSA in nursing home

- i. OSHA RULE:
 1. PPE must not be worn in any common or public area (workers)
- ii. HEALTHCARE RULES IF PERSON IS KNOWN TO HAVE A TRANSMISSION-BASED INFECTION:
 1. Outside a patient room the PERSON wears protective equipment
 2. To enter a patient room the WORKER wears protective equipment
- iii. Correct rule application
- iv. At hospital EMS personnel:
 1. Apply gown/mask/gloves before entering patient room
 2. Enter room and assist person to apply mask
 3. At doorway remove protective equipment – gloves, gown, mask – and wash
- v. At nursing home EMS personnel:
 1. Apply equipment before entering resident room
 2. Enter room, assist person to remove mask
 3. At doorway remove protective equipment (gloves, gown, mask) & wash

This material was produced under grant number SH-20847-10 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.