

### OKLAHOMA ARMY NATIONAL GUARD STATE SAFETY & OCCUPATIONAL HEALTH OFFICE

# Bloodborne Pathogen Exposure Control Program Training

IAW DA Pam 385-10

Courtesy of the State Safety and Occupational Health Office (405)228-5003

### WHAT IS A PATHOGEN?

- A pathogen can be living or non living and is a bacterium, virus, parasite, funghi, protozoa or other microorganism that can cause disease
- Examples of parasites are broad and include many forms such as protozoa to worms that invade the body from the inside and/or outside
- Online Etymology Dictionary defines pathogen as a "disease-producing microorganism" and was first coined in 1880

#### EXAMPLES OF PATHOGENS





### WHAT IS A BLOOD BORNE PATHOGEN?

- Occupational Safety and Health Administration (OSHA) defines a blood borne pathogen as an infectious microorganism in human blood that can cause disease in humans
- Examples of blood borne pathogens include but are not limited to: Hepatitis B, Hepatitis C, Human Immunodeficiency Virus (HIV), Acquired Immunodeficiency Syndrome (AIDS), Malaria, Syphilis

### EXAMPLES OF BLOOD BORNE PATHOGENS

### HEPATITIS B

- Serious liver infection
- Can be chronic in nature
- Increased risk of liver failure, liver cancer, cirrhosis (scarring of the liver)
- A vaccine can prevent infection (within 24 hours of exposure) but there is no cure once a person is infected
- Symptoms can include: abdominal pain, fever, dark urine, joint pain, loss of appetite, nausea/vomiting, weakness/fatigue, yellowing of skin (jaundice)



### HEPATITIS B RISK FACTORS

- Spread through contact with blood, semen or other body fluids from infected person
- Unprotected sex with multiple partners or with an infected individual
- Shares needles during IV drug use
- A man who has sex with other men
- Living with someone who has chronic Hep B infection
- An infant born from an infected mother
- Have a job that exposes you to human blood
- Travel to regions with high HBV rates such as Asia, Pacific Islands, Africa, Eastern Europe

### HEPATITIS B COMPLICATIONS

- Scarring of the liver (cirrhosis) The inflammation associated with a hepatitis B infection can lead to extensive liver scarring (cirrhosis), which may impair the liver's ability to function
- Liver Cancer People with chronic hepatitis B infection have an increased risk of liver cancer
- Liver Failure Acute liver failure is a condition in which the vital functions of the liver shut down. When that occurs, a liver transplant is necessary to sustain life
- Other Conditions People with chronic hepatitis B may develop kidney disease or inflammation of blood vessels

### HEPATITIS C

- Serious liver infection
- Can be infected for years before symptoms become present
- Similar symptoms of Hepatitis B along with the following:
- Bleeding easily
- Bruising easily
- Itchy skin
- Fluid buildup in abdomen
- Swelling of the legs
- Weight loss
- Confusion, drowsiness, slurred speech



### HEPATITIS C RISK FACTORS

- Health care worker who has been exposed to infected blood by way of needle piercing skin
- Inhaled or injected drug use
- Have HIV
- Received piercing or tattoo in unclean environment with unsterile equipment
- Received blood transfusion or organ transplant before 1992
- Received clotting factor concentrates before 1987
- Were ever in prison
- Received hemodialysis treatments for a prolonged period of time
- Born from a woman who had Hepatitis C infection during birth
- Those born between 1945 and 1965 have the highest incidence of Hepatitis C infection

### HEPATITIS C COMPLICATIONS

- Scarring of the liver (cirrhosis) After decades of hepatitis C infection, cirrhosis may occur. Scarring in your liver makes it difficult for your liver to function
- Liver Cancer A small number of people with hepatitis C infection may develop liver cancer
- Liver Failure Advanced cirrhosis may cause your liver to stop functioning

### HUMAN IMMUNODEFICIENCY VIRUS (HIV)

- Primary infection flu like illness within 2-4 weeks after virus enters body, can last weeks
- Fever
- Headache
- Muscle aches and joint pain
- Rash
- Sore throat, painful mouth sores
- Swollen lymph glands mainly on neck
- Diarrhea
- Weight loss
- Cough
- Night sweats



### HIV PROGRESSION TO ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)

- Clinical/latent HIV infection
- Fever fatigue
- Swollen lymph nodes
- Diarrhea
- Weight loss
- Oral yeast infections (thrush)
- Shingles (herpes zoster)
- Pneumonia

- Progression to AIDS
- Sweats
- Chills
- Recurring fever
- Chronic diarrhea
- Swollen lymph nodes
- Persistent white spots or unusual lesions on tongue or in mouth
- Persistent unexplained fatigue
- Weakness
- Weight loss
- Skin rashes or bumps

### HIV/AIDS RISK FACTORS

- Anyone of any age, race, sex or sexual orientation can be infected
- Unprotected sex
- Anal sex increases chance of infection over vaginal sex
- Multiple sex partners
- Have a recurring sexually transmitted infection (STI) with open sores on genitals
- IV drug user

### HIV/AIDS COMPLICATIONS

- Pneumocystis pneumonia (PCP) This fungal infection can cause severe illness. Although it's declined significantly with current treatments for HIV/AIDS, in the U.S. PCP is still the most common cause of pneumonia in people infected with HIV
- Candidiasis (thrush) Candidiasis is a common HIV-related infection. It causes inflammation and a thick, white coating on your mouth, tongue, esophagus or vagina
- Tuberculosis (TB) In resource-limited nations, TB is the most common opportunistic infection associated with HIV. It's a leading cause of death among people with AIDS

- Cytomegalovirus This common herpes virus is transmitted in body fluids such as saliva, blood, urine, semen and breast milk. A healthy immune system inactivates the virus, and it remains dormant in your body. If your immune system weakens, the virus resurfaces — causing damage to your eyes, digestive tract, lungs or other organs
- Cryptococcal meningitis Meningitis is an inflammation of the membranes and fluid surrounding your brain and spinal cord (meninges). Cryptococcal meningitis is a common central nervous system infection associated with HIV, caused by a fungus found in soil
- Toxoplasmosis This potentially deadly infection is caused by Toxoplasma gondii, a parasite spread primarily by cats. Infected cats pass the parasites in their stools, which may then spread to other animals and humans. Toxoplasmosis can cause heart disease, and seizures occur when it spreads to the brain

### HIV/AIDS COMPLICATIONS CONTINUED

- Lymphomia This cancer starts in the white blood cells. The most common early sign is painless swelling of the lymph nodes in your neck, armpit or groin
- Kaposi's Sarcoma A tumor of the blood vessel walls, Kaposi's sarcoma usually appears as pink, red or purple lesions on the skin and mouth. In people with darker skin, the lesions may look dark brown or black. Kaposi's sarcoma can also affect the internal organs, including the digestive tract and lungs
- Wasting Syndrome Untreated HIV/AIDS can cause significant weight loss, often accompanied by diarrhea, chronic weakness and fever

- Neurological complications HIV can cause neurological symptoms such as confusion, forgetfulness, depression, anxiety and difficulty walking. HIV-associated neurocognitive disorders (HAND) can range from mild symptoms of behavioral changes and reduced mental functioning to severe dementia causing weakness and inability to function
- Kidney Disease HIV-associated nephropathy (HIVAN) is an inflammation of the tiny filters in your kidneys that remove excess fluid and wastes from your blood and pass them to your urine. It most often affects black or Hispanic people
- Liver Disease Liver disease is also a major complication, especially in people who also have hepatitis B or hepatitis C

### MALARIA

- Fever
- Chills
- General feeling of discomfort
- Headache
- Nausea/vomiting
- Diarrhea
- Abdominal pain
- Muscle or joint pain
- Fatigue
- Rapid breathing/heart rate
- cough



### MALARIA RISK FACTORS

- Live in Sub-Sahara Africa, South and Southeast Asia, Pacific Islands, Central America and northern South America
- Transmitted by infected mosquito
- Parasite infects the liver, can stay dormant for up to a year
- Parasite matures in the liver and then moves to infect red blood cells producing malaria symptoms
- Can transfer from infected mother to unborn child
- Blood transfusions
- Sharing needles

### MALARIA COMPLICATIONS

- Cerebral malaria If parasite-filled blood cells block small blood vessels to your brain (cerebral malaria), swelling of your brain or brain damage may occur. Cerebral malaria may cause seizures and coma
- Breathing Problems Accumulated fluid in your lungs (pulmonary edema) can make it difficult to breathe
- Organ failure Malaria can damage the kidneys or liver or cause the spleen to rupture. Any of these conditions can be life-threatening
- Anemia Malaria may result in not having enough red blood cells for an adequate supply of oxygen to your body's tissues (anemia)
- Low blood sugar Severe forms of malaria can cause low blood sugar (hypoglycemia), as can quinine — a common medication used to combat malaria. Very low blood sugar can result in coma or death

### SYPHILIS

- Develops in stages, symptoms vary with each stage
- Stages may overlap, symptoms don't always occur in the same order
- Infection may go unnoticed for years



### PRIMARY AND SECONDARY SYPHILIS

- Small sore where bacteria enters body called a chancre (shang-kur)
- Chancre usually occurs about 3 weeks after exposure
- Sore can be painless
- Can be hidden in vagina or rectum
- Sore will heal on its own in 3 to 6 weeks

- Within few weeks of chancre healing, non-itchy rash appears on trunk eventually covering whole body
- May be accompanied by wart-like sores in mouth or genital area
- Other symptoms include hair loss, muscle aches, fever, sore throat, sqollen lymph nodes
- May persist for up to a year

### LATENT AND TERTIARY SYPHILIS

- Untreated syphilis moves to latent stage
- No perceived symptoms
- Can last for years
- Signs and symptoms may never come back

- I 5-30% of untreated patients develop complications as tertiary syphilis
- May damage brain, nerves, eyes, heart, blood vessels, liver, bones and joints
- Damage may occur many years after original untreated infection

### NEUROSYPHILIS AND CONGENITAL SYPHILIS

- At any stage syphilis can spread and damage the eye (ocular syphilis), brain and nervous system
- Babies born from women who are infected with syphilis can become infected through the placenta or during birth
- Generally no symptoms present
- May have rash on hand palms and soles of feet
- Later symptoms include deafness, dental deformities, saddle nose
- Can be born too early, stillborn or die after birth

### SYPHILIS RISK FACTORS

- Unprotected sex
- Sex with multiple partners
- Man who has sex with other men
- Are already infected with HIV/AIDS

### SYPHILIS COMPLICATIONS

- Small bumps or tumors Called gummas, these bumps can develop on your skin, bones, liver or any other organ in the late stage of syphilis. Gummas usually disappear after treatment with antibiotics
- Neurological problems headache, stroke, meningitis, hearing loss, visual problems/blindness, dementia, loss of pain and temperature sensations, sexual dysfunction in men (impotence), bladder incontinence
- Cardiovascular problems These may include bulging (aneurysm) and inflammation of the aorta — your body's major artery — and of other blood vessels. Syphilis may also damage heart valves
- HIV Infection Adults with sexually transmitted syphilis or other genital ulcers have an estimated two- to fivefold increased risk of contracting HIV.A syphilis sore can bleed easily, providing an easy way for HIV to enter your bloodstream during sexual activity
- Pregnancy and childbirth complications If you're pregnant, you may pass syphilis to your unborn baby. Congenital syphilis greatly increases the risk of miscarriage, stillbirth or your newborn's death within a few days after birth

### THE RISK IS OUT THERE SO HOW DO WE CONTROL EXPOSURE?

#### EXPOSURE CONTROL PLAN

What is an exposure control plan?

 An exposure control plan (ECP) is a framework for compliance where the employer creates a written plan to protect their workers from bloodborne pathogens.
This written plan is a requirement for compliance. Without the ECP there is no enforceable program, no set controls and little hope of actually protecting workers.

#### 7 ELEMENTS TO A SUCCESSFUL ECP

- Exposure determination
- Methods of implementation and control
- Hepatitis B vaccine
- Post-exposure evaluation and follow-up
- Communication of hazards and training
- Record keeping
- Administration of post exposure incidents

### I. EXPOSURE DETERMINATION

 The ECP should include names, department and task of each employee where potential for occupation exposure to bodily fluids exists



### 2. METHODS OF IMPLEMENTATION AND CONTROL

- Exposure control plan the baseline framework which everything else is built upon
- Outlines all process and procedures to prevent and correct exposure of potential infectious diseases
- Outlines employee training



- Engineering and control practices ways to eliminate exposure or to limit exposure by design
- Methods include sharps containers for sharps disposal
- Review of work practices and update as technology/techniques advance
- Educating employees and including involvement and awareness for employees



- Personal protective equipment (PPE) supplies given to workers by employers for added protection include but not limited to:
- Gloves
- Gowns
- Face protection
- Goggles
- Training and education on usage of PPE



- Housekeeping outlines proper use and procedures to handle, clean and dispose of contaminated materials like clothing, emesis basins, sharps disposals, towels, rags, etc
- Biohazard clean-up kits
- Sharps containers
- Biohazard bins



- Laundry Clothing that may have been exposed must be disposed of or treated appropriately
- Disposed into red biohazard bags or red biohazard bins



- Labels equipment that is to be used for storage or the removal of biohazard must be labeled accordingly
- Waste baskets, refrigerators, containers, biohazard bags



### 3. HEPATITIS B VACCINE

- Employer must provide training and vaccinations to employees who as a part of their job will be exposed to potentially infectious bodily fluids
- Not many reasons why an employee would NOT be required to be vaccinated
- If a worker denies a vaccine they MUST sign documentation stating their refusal and document stored with bloodborne pathogen program records



# 4. POST-EXPOSURE EVALUATION AND FOLLOW UP

- A confidential medical evaluation with follow up MUST be conducted immediately after an exposure event
- Evaluation must detail several steps including documenting how the exposure occurred, test for infection, blood collection for evaluation and possible further testing



### 5. COMMUNICATION OF HAZARDS AND TRAINING

- Training, training, training
- Every worker who has occupational exposure to bloodborne pathogens must be trained about what bloodborne pathogens are, their symptoms and the transmission of those diseases
- Employees are highly encouraged to ask questions to the instructor and get the needed answers



### 6. RECORD KEEPING

- 4 types of records OSHA requires
- Training, medical, incident, sharps injury
- All records must be maintained by employer
- Length of time that records must be maintained vary based on record type (training = 3 years versus medical records = 30 years)



### 7. ADMINISTRATION OF POST EXPOSURE INCIDENTS

- Employer is required to review the ECP as well as all the processes and procedures surrounding the exposed employee
- Findings upon reviews should be used for the purpose of preventing future exposure events



### REVIEW

- Pathogens are living and nonliving and can cause disease in and on humans
- Bloodborne pathogens move from human to human through blood contact
- Several types of bloodborne pathogens to include Hepatitis B and C, HIV/AIDS, Malaria and Syphilis

- Exposure control plan includes:
- Exposure determination
- Methods of implementation and control
- Vaccinations
- Post-exposure evaluation and follow-up
- Communication of hazards and training
- Record keeping
- Administration of post exposure incidents

### HYPOTHETICALS

• Question: I work in a machine shop, why do I need to know this?

- Answer: Bureau of Labor Statistics and OSHA state that there are roughly 18,000 amputation, crush injuries, lacerations and abrasions suffered by American machinists each year with over 800 fatalities
- OSHA has 417 pages with 20 instances of various machine accidents on each page
- All of these accidents are bloodborne exposure events

### HYPOTHETICALS

 Question: I work in an office environment with no machinery in sight. Am I still at risk for bloodborne pathogen exposure?

- Answer: While the risk is substantially less, there is always a risk of exposure.
- Center for Disease Control (CDC) states slips/falls are 2x more common for office workers than non-office workers
- Homicide is the 4<sup>th</sup> leading cause of fatalities (2010) in the work place

### CLOSING

- Until all disease is eradicated from the planet there will always be a risk for bloodborne pathogenic exposure
- Bloodborne pathogenic exposure can be life altering to include death
- Everything in life to include work has inherent risk associated with it
- Humans will continue to design controls and methods to reduce that inherent risk if not for safety reasons than for litigious reasons

## QUESTIONS

### OKLAHOMA ARMY NATIONAL GUARD STATE SAFETY & OCCUPATIONAL HEALTH OFFICE

ALWAYS READY, ALWAYS THERE

- Full Time Safety and Occ Health Office Staff
- Mr. Calvin Grade, Safety & Occupational Health Manager
- Office: (405) 228-5003
- Mr. Rustin Wonn, Occupational Health Nurse
- Office: (405) 228-5602
- Mrs. Carrie Bray (Elwell), Safety Specialist
- Office: (405) 228-5013
- CW3 Jeffery Sanderson, Safety Specialist
- Office: (405) 228-5025
- SFC Christopher Loney, Industrial Hygiene Technician
- Office: (405) 228-5603

- M-Day Safety Office Staff:
- MAJ Frank Carter
- MAJ Christopher Yancy
- CW3 Ronnie Wilson
- MSG Shameka Steele
- SFC Joshua Dolezal
- SSG Mark Poe
- SSG Barrett Troutman

### REFERENCES

- Online Etymology Dictionary <u>www.etymoline.com/word/pathogen</u>
- OSHA 29 CFR 1910.1030 Blood borne Pathogens <u>Bloodborne Pathogens</u> -<u>Standards</u> | Occupational Safety and Health Administration (osha.gov)
- Mayo Clinic <u>www.mayoclinic.org</u>
- Mayo Clinic Hepatitis B <u>Hepatitis B Symptoms and causes Mayo Clinic</u>
- Mayo Clinic Hepatitis C <u>Hepatitis C Symptoms and causes Mayo Clinic</u>
- Mayo Clinic HIV <u>HIV/AIDS Symptoms and causes Mayo Clinic</u>
- Mayo Clinic Malaria <u>Malaria Symptoms and causes Mayo Clinic</u>
- Mayo Clinic Syphilis <u>Syphilis Symptoms and causes Mayo Clinic</u>

### REFERENCES

- CDC Blood borne Infectious Diseases <u>CDC Bloodborne Infectious Diseases HIV/AIDS, Hepatitis</u> <u>BVirus, and Hepatitis CVirus - NIOSH Workplace Safety and Health Topic</u>
- MFASCO Health & Safety <u>OSHA Bloodborne Pathogens Standard & Exposure Control Plan</u> <u>MFASCO</u>
- Dept of Defense (DoD) Refers to OSHA 29 CFR 1910.1030
- US Army Biological Hazards (army.mil)
- State of Oklahoma (no functioning state level program) <u>Oklahoma Bloodborne Pathogens laws & safety compliance analysis (blr.com)</u>
- Machinists Injuries <u>5 Common Machine Shop Injuries, and How to Prevent Them | American Machinist</u>
- OSHA Machinist Accidents <u>Accident Search Results Page | Occupational Safety and Health</u> <u>Administration (osha.gov)</u>
- Office injuries Office Injury Statistics Rethink What You Know About Office Injuries | Aftermath Services